THE AUTOMOBILE

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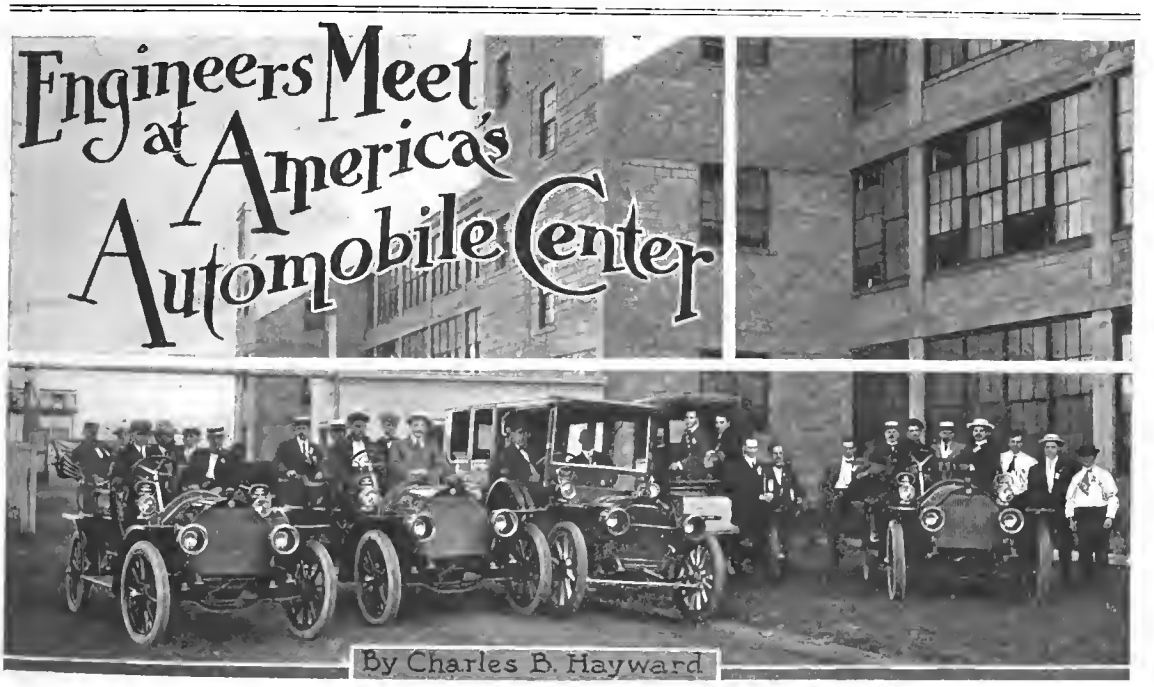
THE AUTOMOBILE

Engineers Meet at America's Automobile Center



By Charles B. Hayward

Engineers Looking Pleasant at the Fine New Plant of the Chalmers-Detroit Company.

DETROIT, June 27.—With the conclusion of the luncheon tendered the visiting technical men by Messrs. Russell and Rumney, of the Detroit Steel Products Company, at the Detroit Boat Club on Belle Isle, and the technical session and business meeting which followed it, there came to an end the most successful gathering that the Society of Automobile Engineers has ever had in its existence of three years. It was the Third Annual summer meeting and was scheduled for Thursday, Friday, and Saturday of this week, but the widespread interest manifested in the occasion became evident very early as the automobile builders and designers, as well as their technical confrères in the accessory field, began to drop in at the Hotel Tuller headquarters on Wednesday afternoon, and as shown by the Society register, there were representatives from Coast to Coast, arrivals from Boston and Los Angeles coming in close proximity, while practically every important automobile manufacturing center east of the Mississippi contributed its quota of talent.

As the result of the untiring efforts of H. E. Coffin, chairman of the Detroit entertainment committee, and his co-workers, James H. Herron, Russell Huff, Henry Ford, and Alanson P. Brush, everything was in complete readiness for the visiting engineers. Owing to the most cordial invitation of the American Society of Mechanical Engineers to participate in all and any of the numerous entertainments provided by the local committee of that body and extended to the automobile engineers by President Holman and Secretary Rice of the A. S. M. E., it was impossible to definitely outline the entire program in advance. After conferring with Messrs. Coffin, Herron and Huff, of the local committee, it was decided to schedule the papers by E. S. Foljambe on "Autogenous Welding in Automobile Construction," and by Otto Heins on "Some Recent Developments in Magneto Ignition with Special Reference to the Bosch System," for Thursday night instead of devoting an entire evening to each, in order to be able to take advantage of the very kind invitation of the Mechanical Engineers to take part in their excursion to Bois Blanc island, at the mouth of the Detroit river, on Friday afternoon.

The first thing on the program Thursday morning was attendance at the launching of the huge lake freighter, Daniel B. Meachem, the invitation of the Great Lakes Engineering Works to the Mechanical Engineers having been extended by the latter to the automobile fraternity. The steamer "Britannia" left the Third street dock, loaded to the rails, and proceeded down the river to the shipbuilding plant. The 10,500-ton cargo carrier was slid off the ways laterally and plunged into her native element with what was scarcely a ripple, considering her huge bulk, though some of the engineers and their ladies whose curiosity led them too near found the wavelet real moist when it caught them unawares.

Thomas-Detroits Which Took Visitors to Grosse Point.

The automobile contingent was met at the dock on the return of the "Britannia" by a number of cars kindly tendered for the occasion by the Thomas, now the Chalmers, and the Packard factories, and were taken out to Dobson's, where one of the typical frog-leg and chicken dinners for which Detroit is so justly famous was served at the invitation of the Society. Following this, the members were treated to a view of the long line of beautiful residences that front on Lake St. Clair. The ladies of the auto engineers' party were then left at the Detroit Country Club for afternoon tea with the ladies of the A. S. M. E., at the invitation of Mrs. Dow, head of the ladies' entertainment committee, the engineers themselves proceeding to the Thomas plant, where they were welcomed by Mr. Coffin and his right hand man, J. G. Utz, and R. G. Chapin, treasurer of the company.

Naturally, the chief object of interest was Mr. Coffin's new production, the Chalmers-New-Detroit, upon which he and Mr. Utz have been working for a year or two past, one of the cars having been on the road since last October, but which has been kept so very quiet that none outside of the shop had the faintest inkling of the new and startling development until its creators were ready to take the lid off, for the car that had been on the road all that time was most effectively disguised with a huge body and tool box.

Expressions of surprise and admiration at the many ingenious and novel features incorporated in the car by Mr. Coffin, such as its block motor, integral manifolds, with power plant and transmission on three-point suspension, single pedal clutch and brake control, were universal. The light and airy buildings of the new Chalmers plant with their high ceilings, white walls, and immense stretches of glass, also came in for unstinted approval, while the many kinks of shop practice introduced by Mr. Coffin and his assistants to facilitate manufacturing, and particularly the assembling of the cars, brought forth much commendation. After looking pleasant for the ubiquitous man behind the camera, Mr. Benham—and who could not look pleasant in Detroit, where as expressed by the motto on the reverse of the souvenir fobs presented by the local committee, "Life is worth living"—the engineers were whisked across town to the Ford plant.

On the "Britannia" at the Invitation of the A. S. M. E.

The men who design and build cars and their parts had already been treated to more than one surprise, but here indeed was a genuine eye-opener that made every optic literally bulge. The very atmosphere of the plant seemed to spawn Ford runabouts and roadsters—they were here, there, and everywhere, wherever one looked he saw Fords, not in ones and twos, but in flocks. Under the kind guidance of Mr. Wills, the factory superintendent and technical head of the plant, the engineers were treated to a comprehensive view of the system that makes a Ford "every six minutes of every working day," a possibility. But it was not in the ingenuity displayed in the numerous methods of machining and assembling the eighty odd cars that constituted a day's output, that drew open-mouthed admiration, as it was the spirit of the workmen. "Man alive, they actually run and jump to grab the pieces to put them together," remarked one of the experienced visiting designers to a confrère. Wherever one looked, the men were finishing parts and building Ford cars from the ground up, as if their very existence depended upon finishing the task in hand. But when they came to the next job, it was the same story of high pressure and sustained tension. "Every man in the place must be on piece work," was the opinion voiced by an old hand in shop practice and management, but a request for enlightenment on the subject made later to James Couzens, treasurer of the Ford Company, proved this not to be the case. "It's the Ford spirit," said Mr. Couzens, and the men who had seen its working realized for the first time that it was the intangible thing that the Frenchmen have so aptly termed *esprit de corps* that made possible the manufacture of more than 17,000 cars in less than two years.

President Fay and Manager Newman Confer.

"We're practically cleaning up this series now," remarked Mr. Wills to an inquiry. "But what are these endless stacks of finished motor units that cover every part of the floor?" asked the questioner. "Oh, those will all be out of here in six weeks or so," said the Ford engineer, adding in a most nonchalant way, "We have only about 2,000 cars left to build." The shutdown whistle for the day found the visiting engineers in the testing room of the plant where two long rows of motors running at full speed made conversation utterly impossible. This was practically the only department in which the long-drawn-out blast of the whistle caused the men to hustle for the wash basin, but anyone who had been testing Ford motors all day was entitled to the privilege. In the other departments, many kept right on working until the rush to wash was through.

In the evening, the first paper scheduled was that on autogenous welding, but owing to some delay in setting up the apparatus for the demonstration, which had been kindly supplied by the Davis-Bournonville Acetylene Development Company of New York, and the Linde Air Products Company of Buffalo, the

paper on "The Storage Battery in Automobile Work," by Bruce Ford, was read and discussed at some length. Mr. Foljambe then gave a brief résumé of his paper on autogenous welding, describing in a few words the apparatus necessary and the method of employing it for both welding and cutting, outlining in addition a few of the many possibilities that this process holds for the automobile builder, such as welding frames and other parts where the original construction of the car is concerned, beside its extremely widespread adaptability to the repairing of broken parts on the car, particularly aluminum and iron castings, as it is easily possible to weld any two or more dissimilar metals, the strength of the joint approximating very closely to that of the original piece before breaking.

Several drop-forged pieces, such as a connecting-rod, which had been cut in half for the purpose, were then quickly put together by Mr. Brunning, a representative of the Linde Air Products Company, the time required not exceeding two or three minutes, even with the meager facilities at hand for holding the work, although in the case of the drop-forged connecting-rod, the remarkable localization of the heat was manifested by the fact that in this eight or nine-inch piece of metal it had not extended sufficiently far from the weld to make it unbearable to the naked hand at the ends and it was possible to pick up the piece without discomfort. A large motor cylinder which had been supplied by Mr. Northway, a member of the Society, for the purpose, was then made good by welding up a four-inch cut that had been made in its water-jacket, strikingly demonstrating the value of the process for repairing castings. But for the possibility of sealing the gap in question in this manner, this cylinder would have been a waster if new, or would have required a replacement, had it broken in this manner in service, but it was made good in less than five minutes, although it is customary on a piece of such size to preheat the whole cylinder in order to avoid setting up internal strains in the metal. Then came the crucial test of the process for one branch of work—that of cutting metals. Mr. Herron, of the local committee, had furnished a slab of 60-point carbon steel a foot or more in length, four inches wide and 1 5-8 inches thick. The object of the demonstration was to show how readily a crankshaft form could be cut from the solid slab and to facilitate turning at the corners, holes had been drilled at those spots. The makeshift nature of the apparatus employed for the test may be appreciated when it is stated that a Prest-O-Lite tank was impressed into service to furnish the acetylene gas. Less than ten minutes were required to cut the top and one side of the crank outline and the efficiency of the process for the purpose having been satisfactorily shown, the demonstration was halted and the subject laid open for discussion. Owing to the extremely wide range of questions that could be brought up, it was decided to request written discussions from the members. A number of the A. S. M. E. members attended this session, the meetings of both societies having been thrown open to the members of both the visiting organizations.

Mr. Heins then read a paper on the subject of "Recent Developments in Magneto Ignition," which was profusely illustrated by lantern slides showing various phases of the develop-

Facing the Camera in Front of the Administration Building of the Fine Plant Where Packards Are Built.

ment of the ignition of the internal combustion motor since the earliest days, then taking up the magneto itself and showing the course of its development in the last eight or ten years to its present high state of perfection. He also compared the efficiency of the coil system of ignition with that of the magneto, as well as that of different types of magnetos, each point being graphically brought out by the use of lantern slides. Mr. Heins' paper also covered such a wide range that it was difficult to discuss it at any length in the time available, and written discussions were accordingly requested. A more detailed report of Mr. Heins' lecture will be found in connection with the transcript of his paper which appears in this issue of THE AUTOMOBILE.

Friday morning, the automobile engineers attended the meeting of the American Society of Mechanical Engineers at the request of the latter, in order to participate in the continued discussion of the paper by Henry Souther on "Clutches." In the absence of Mr. Souther, Secretary Hayward of the S. A. E. was called upon to lead the discussion, consisting of a brief outline of the points brought out by Mr. Souther in his paper. President Fay was then requested to enlighten the mechanical engineers as to some points of automobile clutch design, which he did by calling attention to some of the essential points of the

Chairman Coffin at the Wheel of the Chalmers-New-Detroit.

good clutch as developed during the past several years of experience on the automobile.

Cadillac Plant Came in for Inspection.

Immediately upon the conclusion of this session, the auto engineers were carried in a string of Cadillac cars to visit the plant where the latter are built. This was done at the special invitation of Mr. Leland, head of the Cadillac company, and, realizing that the time available for the visit was limited, the visitors were sent through the plant under the guidance of Messrs. Sweet, Johnson and the other members of the Cadillac technical staff in groups of five, each group making a systematic tour of the whole plant by starting out in a different direction. To the engineer, the most impressive feature of the whole Cadillac plant is its thoroughly worked-out system of manufacturing every part of the car. Although cars were being turned out in large numbers, everything was going along in the most orderly manner, and there were no symptoms of unusual bustle or hurry. But more than this was the striving after the greatest possible accuracy wherever needed that was manifest in the construction of every part so that a Cadillac could be said to be interchangeable in every respect without the necessity of the slightest fitting or alteration, and probably there are few plants that have carried systematic accuracy to the same extent as in the case of the builders of the Cadillac. After having stood for the camera man again, the engineers were whisked over to the Cadillac foundry and their visit was opportunely timed, as the pouring was just under way.

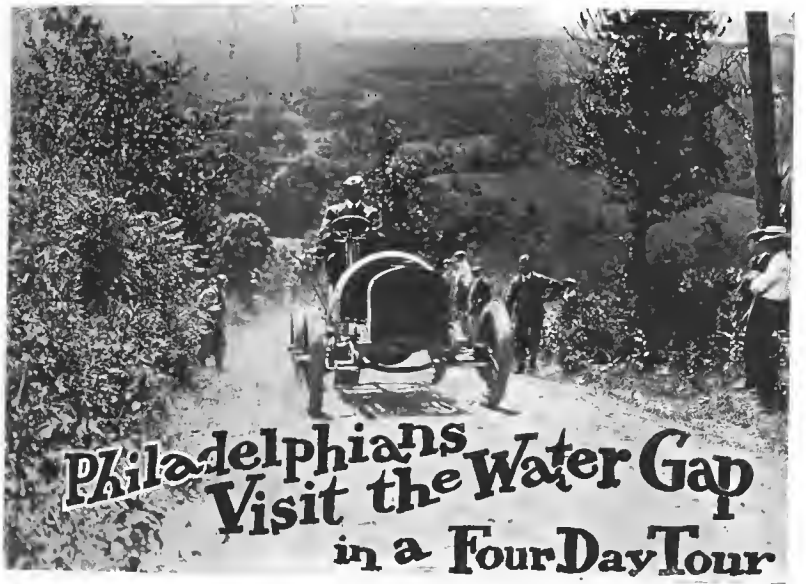
From the Cadillac plant, the automobile designers were taken in the cars to the foot of Bates street, where the steamer Brittania was again boarded at the invitation of the local committee of the A. S. M. E., headed by Mr. Dow, for a run down the river to "Baa Blow" (Bois Blanc) island, where dinner was served in the casino, the steamer bringing the party back about 10 P.M., after the end of the second strenuous day. The next morning, the new plant of the Detroit Steel Products Company was visited in a number of Packard cars and the ubiquitous Woods electric of Newman, who always managed to find his way round town on time, and from the Steel company's plant the cars were again taken for the last factory visit of the meeting, that to the Packard plant. The latter now covers some 12 acres of floor space and is reputed to have no less than 18 miles of rooms in its numerous large buildings, so that the visit was confined to the most interesting departments of the huge factory. A start was made in the testing laboratory, in charge of Daniel Huff, brother of the Packard company's chief engineer, and the action of the 200,000-pound testing machine was shown for the benefit of the visitors on a piece of strap-iron of 1-4-inch thickness. After a trip through the beautifully fitted administration building, the visitors were then conducted through the numerous manufacturing departments and shown the various processes in the building of Packard touring cars and trucks, the running and testing departments coming in for particular attention at the hands of the sharps owing to the extreme thoroughness with which the Packard system of inspection is carried out there. In addition to the Messrs. Huff, who acted as guides, Ralph Estep, the Packard publicity man, and Allen Loomis, one of Mr. Huff's staff, aided by other assistants from the engineering force, piloted the engineers through the plant so that every department of interest was covered by the time the shut-down whistle sounded at 11:30.

Final Session Held on Belle Isle.

A number of Packard and Thomas cars were then impressed for a drive round Belle Isle, ending up an hour later at the Detroit Boat club for the lunch tendered the Society by J. G. Rumney of the Detroit Steel Products Company. The occasion was a most enjoyable one, and Mr. Russell, president of the same company, felicitated the engineers on their visit to Detroit, getting off numerous quips at the expense of those whom he knew personally. The lunch was followed by a business session, at which it was decided to make Cleveland the next place of meeting, the date to be between September 20 and October 10, the exact days to be set by the committee on meetings in conference with the council.

In the absence of Frank Beemer abroad, his paper on the "Unit System of Power Transmission in Automobiles" was read by Secretary Hayward, the brief abstract given of the principal points of Mr. Beemer's arguments for the transmission axle leading to an interesting discussion during which numerous points of value were brought out. This was followed by A. L. Dixon's paper on the "Increased Efficiency of Single Motor Drive," which, owing to the fact that it consisted principally of tabulated data, was read by title, written discussions being promised on both this and several of the phases of Mr. Beemer's subject. The meeting was then adjourned to reconvene in Cleveland three months later, the dates falling somewhat in the fortnight consisting of the last week in September and the first week of October, this being decided by the council and committee on meetings.

Among those present were: Thomas J. Fay, H. M. Swetland, J. W. Cain, R. E. Northway, James H. Herron, J. Wilson Drown, Ernest L. Smith, E. S. Foljambe, John H. Thompson, H. M. Jerome, Marcel de Jarny, George McLean, Russell Huff, Daniel Huff, Allen Loomis, Bruce Ford, H. Vanderbeek, H. K. Holsman, H. B. MacFarland, J. O. Heinze, B. G. Ellis, G. L. Chandler, Robert C. Shoel, G. E. Franquist, F. J. Newman, P. H. Shearer, E. F. Schnuck, George W. Sargent, W. G. Wall, G. B. Norcross, J. A. McMichael, J. W. Bate, Otto Heins, M. H. Ferrell, F. E. Watts, L. Charles Kenen, W. S. Noyes, C. H. Westen, P. J. Brennan, Francis S. Thompson, V. Oldberg, J. E. DuBois, George L. Fish, Courtland D. Cramp, Marius C. Krarup and Charles B. Hayward, Secretary of the Society.



Philadelphians Visit the Water Gap in a Four Day Tour

The Rambler That Was a Three-time Winner During the Tour.

STROUDSBURG, PA., June 30.—While last week's first annual carnival of the Monroe County Automobile Club was not exactly a howling success, it demonstrated the possibilities of such an affair as a medium for attracting automobile visitors to this charming mountain section.

"Jack" Hiscock, the Philadelphia newspaper man who boomed the affair, labored diligently, and but for his efforts the whole thing might have fallen through. Those who took part in the carnival, however, are delighted with their experience—as well they might be, for they were treated like princes.

Story of the First Day's Run.

STROUDSBURG, PA., June 24.—To-day's double header endurance run from New York and Philadelphia to this place was disappointingly meager to the management of the affair. Less than a dozen cars came from the Quaker City, and none at all from Gotham. THE AUTOMOBILE representative had a seat in the Studebaker Navy Dispatch car, driven by Frank Yerger.

A heavy thunderstorm delayed some of the rear cars, several trees having been blown down across the road between Easton and Delaware Water Gap. The length of the route on which the committee set a time limit of 4 hours 24 minutes was 88 miles, and was laid out via Willow Grove, Doylestown, Easton, Portland and the Gap to Stroudsburg. Following is a summary:

CLASS A.

			Penalties			
			Road	Tech.	Total	Cause of Tech. Penalization.
8.	Elmore 30-35	Hardart ..0	0	0		
6.	Mitchell 35	Cram 0	5	5		Leaky Radiator.
10.	Thomas 60	Magraw ..10	0	10		
*4.	Studebaker 80	Yerger ...12	0	12		

*Yerger entered protest against his penalty of 12 points, having been illegally held up 15 minutes in Doylestown by the local police, and afterwards released with an apology.

CLASS B.

2.	Thomas-Detroit ..40	Stetson ...0	0	0		
7.	Autocar 24	Brown 0	2	2		Smashed universal joint boot.
13.	Packard 30	Simonin 194	0	194		

CLASS C.

3.	Ford 15	White 0	0	0		

Second Day Was the Hill-climb.

STROUDSBURG, PA., June 25.—The paucity of entires spoiled the hill-climb at the Water Gap to-day. The program was completed in something less than an hour. The scene of the climb which is called Gulick Hill, is a cross-road connecting the Cherry Valley and Foxtown roads. It is a trifle over 5,000 feet long, and the first 300 yards are the most difficult of the course—with a grade closely approaching 20 per cent. running straight up.

The start was from in front of the "Cherry Creek Farm," an ancient hostelry which has acquired fame (since the climb) for its hard cider and ice-cold spring water. The platform on which the officials were perched at the finish fairly overhung the deep valley, the view across which to the Delaware Water Gap elicited complimentary adjectives as to the artistic instincts of the promoters.

The feature of the day, which was to have been the upward flight of Levey's 120-horsepower Hotchkiss in the free-for all, came as near as a hair to being a tragedy, but, fortunately, "Jud" Kilpatrick, its driver, had his noddle with him, and when he swung to the outside on the last sharp turn and dashed into an upright of the stout fence erected as a protection to travelers at that point, he shut off his engine and managed to stop the car, without injury either to himself or to his mechanician, Stephen Carusso, although the latter was catapulted about 20 feet ahead of the car when it struck. The only visible injury to the flyer was the bending of the left end of the front axle, the top of the wheel standing out at an angle of 45 degrees as the Hotchkiss hobbled painfully past the finish on her way to the hospital in Stroudsburg.

The mishap to the Hotchkiss gave a walkover victory for the free-for-all honors to the Zust "40," driven by Jules Berigne, which negotiated the hill in 1:57.

Strange to say, the free-for-all winner's time was badly beaten in the $1,251 to $2,000 gasoline event, when the stripped Rambler "24," owned and driven by W. H. Pierce, made the trip in 1:46 2-5, the runner up, Bert Clark's 65-horsepower Jackson also beating the Zust's time by an even five seconds.

Jules Berigne's Zust "40" also had a walkover in the $4,001-and-over class, with a voyage in 2:04. The summary:

GASOLINE STOCK CARS, $851 TO $1,250.

36.	Buick 22	H. D. Church 2:13 2-5	
37.	Jackson 24	J. A. Rutan.....2:20	

GASOLINE STOCK CARS, $1,251 TO $2,000.

39.	Rambler 35	W. H. Pierce 1:46 2-5	
38.	Jackson 35	Bert Clark 1:52	

STEAM OR GASOLINE STOCK CARS, $2,001 TO $3,000.

4.	Studebaker 30	Frank Yerger 2:23 2-5	

Where the Officials Were Located on Pocono's Summit.

The Pennsylvania That Won in the Third Day's Event.

Kilpatrick Driving the Hotchkiss Up Old Pocono.

GASOLINE STOCK CARS, $4,001 AND OVER.

47.	Zust	40	Jules Berigne	2:04

FREE-FOR-ALL.

47.	Zust	40	Jules Berigne	1:57
42.	Hotchkiss	120	J. Kilpatrick....Damaged in collision.	

Third Day Brought Out the Speeders.

STROUDSBURG, PA., June 26.—The scene shifted to-day to Pocono summit, where a fair mile straightaway had been laid out. The course was rolling, however, and the star card, Levey's Hotchkiss, was unable to show its best paces. Kilpatrick drove the big smoke to the course record of :48 3-5, the only other car to get under the minute being the Pennsylvania "50," driven by J. Brown, which did :59 1-5 in the free-for-all, and captured another event in :58 3-5. The stripped Rambler, which made the fastest time in the Water Gap climb, again won in its class —15:1 to 24-horsepower gasoline cars—in 1:16 3-5, beating out the Buick and the Stevens-Duryea. Summary:

GASOLINE STOCK CARS, 15.1 to 24-H.P., INCLUSIVE.

39.	Rambler	24	W. H. Pierce	1:16 3-5
36.	Buick	18	H. D. Church	1:23
49.	Stevens-Duryea		J. Lee	1:27

SPECIAL EVENT.

87.	Jackson	24	W. Smith	1:16 1-5

FREE-FOR-ALL.

42.	Hotchkiss	120	J. Kilpatrick	:48 3-5
46.	Pennsylvania	50	J. Brown	:59 1-5
43.	Thomas	60	Harry Jones	1:07 2-5
47.	Znst	40	Jules Berigne	1:13

GASOLINE STOCK CARS, TOTAL PISTON AREA NOT EXCEEDING 103.87 SQUARE INCHES (BRIARCLIFF MODELS ELIGIBLE).

46.	Pennsylvania	50	J. Brown	:58 3-5
43.	Thomas	60	Harry Jones	1:03 3-5

In the afternoon hill-climb for amateurs, which was held at Canadensis, five miles across the mountains from Pocono summit, the feature once more was the Hotchkiss, which in a special event arranged for that car and the Pennsylvania, beat out the latter by a good margin, its best time in three trials being :23 1-5 as against the Pennsy's :27 3-5. The event of the afternoon, the free-for-all, was a walkover for A. R. Allen's Thomas, time :32. The Thomas later did :30 flat. Summary:

SPECIAL EVENT FOR HILL RECORD.

42.	Hotchkiss	120	J. Kilpatrick...	:24; :23 1-5; :23 2-5
46.	Pennsylvania	50	J. Brown	:28; :27 3-5
43.	Thomas	60	Harry Jones	:30

GASOLINE STOCK CARS, $851 TO $1,250.

37.	Jackson	35	J. A. Rutan	:42

GASOLINE STOCK CARS, $1,251 TO $2,000.

39.	Rambler	24	W. H. Pierce	:34 2-5
38.	Jackson	35	B. Clark	:38 2-5

GASOLINE STOCK CARS, $3,001 TO $4,000.

50.	Stevens-Duryea	35	T. J. Kitson	:34 2-5
44.	Stevens-Duryea	35	A. G. Scott	:34 3-5
51.	Stevens-Duryea	35	W. C. Snover	:40
52.	Stevens-Duryea	35	W. B. Easton	:41

FREE-FOR-ALL.

43.	Thomas	60	Harry Jones	:32

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50.	Stevens-Duryea	35	T. J. Kitson	:34
36.	Buick	22	H. D. Church	:43 2-5
45.	Maxwell	28	W. C. Snover	47 2-5

Fourth Day Was the Wind-up.

STROUDSBURG, PA., June 27.—The carnival rounded up this afternoon with a gymkhana on the half-mile track at the Monroe County Fair Grounds. Again the mighty Hotchkiss featured, Kilpatrick taking chances in driving his car to the track record of :35 3-5.

The driving a-mile-at-the-rate-of-ten-miles-an-hour event was won by J. D. Smith in a Jackson, H. R. Worthington, in a Benz, being the next best guesser, and D. H. Gaines, in a Zust, the third.

Stevens-Duryea That Won Twice on the Third Day.

Elmore That Won the Cup in Class A on the Run.

HOW THE AUTOS CLIMBED SKIPPACK HILL

NORRISTOWN, PA., June 30.—That the "Willie" Haupt-Chadwick combination is the fastest thing in the hill-climbing line in this country if not in the world, was demonstrated last Saturday afternoon at the first annual hill-climb of the Norristown Automobile Club on Skippack Hill, a one and one-fifth mile, 3-to-10 per cent. grade, some five miles north of this town. Haupt twice cleaned up a big field by a big margin, and in his last trial he pushed his Great Chadwick "Six" to the limit and registered :57 2-5—a record which, by the way, he says he can better. A little figuring will show that this time represents a 75-mile-an-hour clip, and on the level stretch just beyond the finish he says his speedometer showed 80 miles. In his first official trial, in the gasoline free-for-all, he just missed getting under the minute—1:01, which is going some—up hill.

Haupt and His Record-breaking Chadwick.

There were three score trials at the hill, and the times made in all classes were very fast. While there was some little delay, due to the overcrowding of the course at the finish, the management of the whole affair reflects great credit on the hustling organization which promoted it. All hands worked like beavers, and, when the inadequate policing is taken into consideration, the promptness with which the program was run off was highly commendable. Fully 15,000 people lined the course, which had been oiled and was lightning fast.

The Chadwick had the same gearing as at Wilkes-Barre, but, whereas Haupt used his second (2.6) and third (3.9) speed there, here he relied entirely upon his high gear (1.9). All the events but the free-for-alls were from standing starts. In the big races the entrants went a couple of hundred yards up the hill on the other side of Skippack Creek to get a start, and the difference between the two styles was worth from 15 to 20 seconds.

The hill is 6,270 feet long, 352 feet high, and almost a straight-away, there being one slight bent about a third of a mile from the start. One bad feature of the course, however, is the trolley line which parallels it, the tracks crossing from one side to the other about midway of the hill. The cars of this line were in operation throughout the contest, but men with big red flags were on duty all the afternoon, and no hold-ups or accidents occurred. A liberal treatment of "Asphaltoilene" had laid the dust and rendered the going superb.

At the top of the hill, from which, by the way, seven counties may be seen, the grandstand and judges' stand were erected, on the right ascending the hill. The timing system was something new in that line, having been invented by a Norristowner named Ballard. At start and finish a rubber hose filled with water was used instead of the usual tape. The pressure of the tires on the hose forced the water upward and effected an electrical contact which rang a bell both at start and finish. The bells were a trifle weak, however, and had to be listened for attentively by the timers in order to avoid a mistake. More current and louder bells would make the system a good one.

A half dozen State constabulary, one or two Norristown policemen and several club members armed with badges and sticks tried to keep the course clear, but it was not until the grandstand was thrown open to the public free of charge that they succeeded. That no accidents resulted was due in large measure to the officials, who, armed with megaphones, kept the crowd on the *qui vive* with their "car coming."

Aside from the overshadowing Chadwick performances, the hit of the day was made by the Knox "30," driven by William Bourgue. Although listed at $2,600, it won the $4,001-and-over class from such stalwarts as a pair of Apperson "55's" and two Stearns "60's," finished next to the Chadwick in the gasoline free-for-all, ahead of several cars costing twice as much, and captured fifth place in the big free-for-all. Earlier in the day, while competing in its own ($2,001 and $3,000) class, Bourgue stopped before reaching the finish and returned and asked for another start. There was an immediate protest from all hands, but he was allowed to start, nevertheless, and made the best time in the class, 1:33 3-5. The officials, however, upheld the protest, and the Knox, having failed to reach the finish on its official trial, is credited with being "stalled," the race going to the Pennsylvania "50," with Zengle driving, in 1:36. The Pennsy also captured the $3,001 to $4,000 class in 1:38 2-5, just nosing out A. C. Miller and his Stoddard-Dayton by one-fifth of a second.

Bourgue and His Knox That Won in Its Class.

The Overland "24," driven by J. Brockway, won the $851 to $1,250 class in 2:11, but was beaten out by the Jackson "35," W. J. Hays, Jr., up, in the $1,251 to $2,000 gasoline class. The Jackson was the first car to get under the two-minute mark—1:53.

The first car to climb the hill in the gasoline free-for-all was Bourgue's Knox "30," and when the time, 1:15 4-5, was hung out, there were great expectations entertained of what the big fellows would do. But not one of them could get under the

Brockway's Overland Capturing the Second Event.

little Knox's figures until the Chadwick did the trick in 1:01. Even the mighty Matheson, the ponderous Pennsylvania, the sturdy Stearns and the active Apperson failed, while the less powerful cars seemed to be out of it entirely. There were many mutterings, head-shakings and inquisitive glances cast at the light gray flyer by the unsuccessful ones as it lay in the paddock waiting for the next event, but it played in second place to the Chadwick alone of all its opponents.

In the final free-for-all, however, after Bourgue's Knox had done 1:16 2-5, and the charging Chadwick had buried the hopes of all the others with its :57 2-5, Al. Dennison's Knox "48" got under its little brother's time with a 1:13 2-5 journey, and later Joe Parkin, Jr., drove his Parkin "60" to a 1:16 trip, which was duplicated a few minutes later by Harry Goodin in his "Sixty" Stearns. The summary, which includes a very representative list of cars, follows:

GASOLINE STOCK CARS, $850 AND UNDER (STANDING START).

1.	Buick	18	$850	C. W. Mann	2:16 1-5
2.	Ford	18	600	J. F. Graham	2:23
3.	Ford	18	700	R. S. Heebner	2:35 3-5
4.	Buick	18	850	J. K. Lewis	2:58
5.	Buggy runabout	14	680	B. Applegate	3:40 1-5

GASOLINE STOCK CARS, $851 TO $1,250 (STANDING START).

1.	Overland	24	$1,250	J. Brockway	2:11
2.	Buick	18	850	C. W. Mann	2:16 3-5
3.	Mitchell	20	1,000	B. F. Stritzinger	2:31
4.	Reo	20	1,025	H. Greenwood	2:38 1-5
5.	Auburn	22	1,250	H. W. Trump	2:44

GASOLINE STOCK CARS, $1,251 TO $2,000 (STANDING START).

1.	Jackson	35	$2,000	W. J. Hays, Jr.	1:53
2.	Overland	24	1,250	J. Brockway	2:05 3-5
3.	Oldsmobile	35	2,000	Tom Berger	2:15
4.	Mitchell	35	2,000	B. F. Stritzinger	2:26

GASOLINE STOCK CARS, $2,001 TO $3,000 (STANDING START).

1.	Pennsylvania	50	$3,000	L. Zengle	1:36
2.	Stoddard-Dayton	45	2,700	A. C. Miller	1:38 2-5
3.	Jackson	35	2,000	W. J. Hays, Jr.	1:41 2-5
4.	Columbia	29	3,000	J. J. Coffey	1:46 1-5
5.	Ford	40	2,800	L. C. Block	1:54
6.	Crawford	50	3,000	T. M. Twining	2:05
7.	Acme	30	3,000	R. H. Morris	2:07 1-5
8.	Crawford	40	3,000		2:47 1-5
9.	Crawford	50	8,000	R. S. Crawford	3:57 3-5
10.	Knox	30	2,500	W. Bourgue	*Stalled
11.	Cadillac	30	2,500	J. E. Lee	Stalled

*Started again under protest and climbed the hill in 1:33 3-5, but protest was sustained.

GASOLINE STOCK CARS, $3,001 TO $4,000 (STANDING START).

1.	Pennsylvania	50	$3,000	L. Zengle	1:36 2-5
2.	Stoddard-Dayton	45	2,700	A. C. Miller	1:38 3-5
3.	Pope-Toledo	40	3,500	Alan Wood, 3d	2:10

GASOLINE STOCK CARS, $4,001 AND OVER (STANDING START).

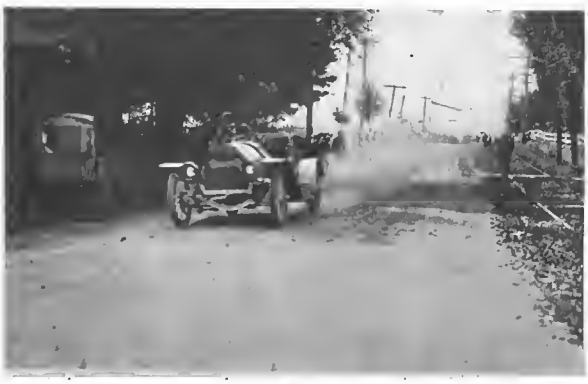
1.	Knox	30	$2,600	W. Bourgue	1:33
2.	Apperson	55	5,000	C. J. Swain	1:37
3.	Apperson	55	5,000	George Davis	1:38 3-5
4.	Stearns	60	4,600	Harry Goodin	1:40 3-5
5.	Parkin	50		Joe Parkin, Jr.	1:48
6.	Stearns	60	4,600	J. F. Betz, 3d	1:48 4-5

FREE-FOR-ALL GASOLINE CARS (FLYING START).

1.	Chadwick	50	$6,500	W. Haupt	1:01
2.	Knox	30	2,500	W. Bourgue	1:15 4-5
3.	Knox	48		Albert Dennison	1:16
4.	Stoddard-Dayton	45	2,700	A. C. Miller	1:18
5.	Parkin	60		Joe Parkin, Jr.	1:18 3-5
6.	Matheson	60	6,000	H. N. Harding	1:19 3-5
7.	Pennsylvania	50	8,000	L. Zengle	1:20
8.	Stearns	50	4,600	Harry Goodin	1:21
9.	Oldsmobile	40	2,750	Tom Berger	1:21 3-5
10.	Columbia	29	3,000	J. J. Coffey	1:23
11.	Apperson	55	5,000	C. J. Swain	1:25
12.	Apperson	55	5,000	George Davis	1:27
13.	Ford	15	600	A. A. Jones	1:50

FREE-FOR-ALL (FLYING START).

1.	Chadwick	50	$6,500	W. Haupt	:57 2-5
2.	Knox	48		A. Dennison	1:13 2-5
3.	Parkin	60		Joe Parkin, Jr.	1:16
4.	Stearns	50	4,600	Harry Goodin	1:16
5.	Knox	30	2,500	W. Bourgue	1:16 2-5
6.	Stoddard-Dayton	45	2,700	A. C. Miller	1:17
7.	Pennsylvania	50	3,000	L. Zengle	1:18 2-5
8.	Matheson	50	6,000	H. N. Harding	1:20
9.	Oldsmobile	40	2,750	Tom Berger	1:22 1-5
10.	Apperson	55	5,000	George Davis	1:23 3-5
11.	Apperson	55	5,000	C. J. Swain	1:24
12.	Jones-Corbin	50		J. Jones	1:52



Zengle in Pennsylvania That Won Two Events.

TWO PACKARDS TIED FOR HAGERMAN CUP.

St. Louis, June 27.—The second annual owners' reliability tour for the James Hagerman, Jr., trophy, which was conducted by the Automobile Club of St. Louis, took place to-day. It resulted in two 30-horsepower 1908 Packards finishing with perfect scores. One was owned and driven by G. E. J. Walsh and the other by Samuel Plant. Both of these contenders also finished last year with no penalizations against them. In accordance with the rules of the tour, which provide that the trophy shall become permanent possession of any one winning it twice in succession, there is a tie between these two for the final ownership of the trophy. The manner of running off the tie will be decided later by a committee selected by the referee.

Of the 25 original entrants 20 started. The course was extremely rocky and hilly. It was 109 miles in length and embraced six controls, as follows: Antonio, De Soto, Antonio, Denny, Sappington and the clubhouse at the finish. The contestants were allotted 1,000 points at the start. From these deductions were made for any mechanical weaknesses that developed. At the end of the run they were examined by a technical committee.

FIFTEEN PERFECT SCORES IN DELAWARE RUN.

Wilmington, Del., June 27.—In the sealed bonnet run of the Delaware Automobile Association to-day, 15 of the 21 contestants finished with perfect scores as follows: Henry McComb Bang, Stoddard-Dayton; J. T. Chandler, Mitchell; William C. Corey, Mitchell; Eugene du Pont's Peerless; Eugene du Pont's Pierce; Eugene Du Pont's Thomas; Dr. John C. Fahey, Maxwell; Robert S. Clover, Maxwell; James F. Hoey, Buick; William E. Holland, Ford; J. R. Richardson, Mitchell; Albert Rothschild, Rainier; Joseph H. Shaw, Franklin, and Frank Yerger, Studebaker. The course was to Valley Forge and back, 79 miles.

TWO TOURS TO THE WILDWOOD RACE MEET.

Two tours are scheduled to start to-morrow for Wildwood, N. J., where a race meet will be run on the Fourth of July. One leaves from New York and the other from Philadelphia.

RECENT DEVELOPMENTS IN MAGNETO IGNITION*

By OTTO HEINS, Member Society of Automobile Engineers.

IN taking up the subject of magneto ignition, it is not my intention to attempt to cover the entire field of endeavor, nor even to try to outline the improvements made in every form of high or low-tension magneto on the market, within the past year or so. My experience has been confined to the Bosch apparatus, which needs no introduction, and it is my intention to show what has been accomplished in the study of automobile ignition devices as represented by the products of this firm.

The electrical advantages inherent in the ordinary low-tension system of ignition are largely offset by the mechanical complication of the mechanical interruptors, and ignition specialists have long sought to successfully combine the low-tension mag-

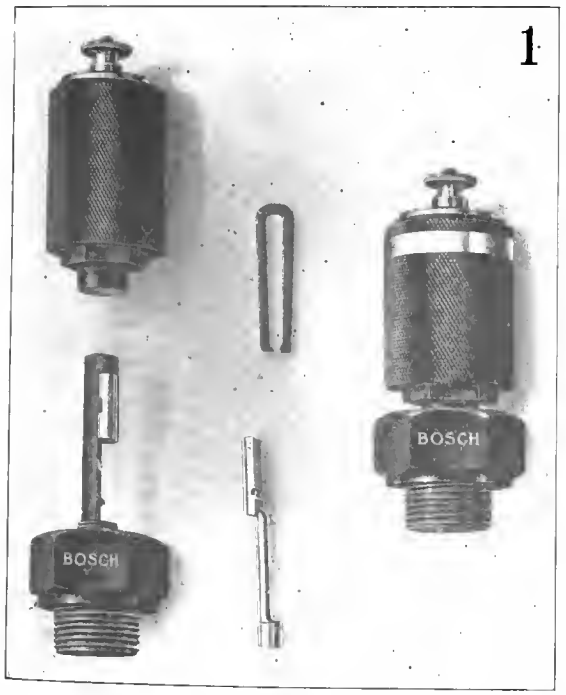


Fig. 1.—Assembly and Components of New Magnetic Plug.

neto-electric outfit. About three years ago the Bosch Magneto Company began experimenting with a magnetically-operated plug device on the Honold System, and last season placed it on the market.

The electro-magnetically operated spark plug is illustrated in Fig. 1. An important part of this plug is the interrupter lever, which rests on a steel knife edge, and one end of which bears on the contact piece, which is screwed into the cylinder wall in the same manner as a high-tension spark plug. At the bottom of the contact piece there is an insulated fixed stem which is magnetically divided in about the middle by means of a brass part, so that when the current passes through the coil, only the portion of the stem above the brass part can be magnetized, and, as a result of this magnetization the upper end of the interrupter lever, which directly faces the magnetized part, is attracted, the lower end simultaneously breaking contact with the contact piece, thus interrupting the current and producing a spark. In the normal position of the interrupter lever, the lower end presses against the contact piece, being kept in that position by a horseshoe-shaped spring, which passes right over the top of the stem and lies in slots in the sides thereof.

The top of the coil is fitted with a contact screw to which the current from the magneto is led. This magneto (Fig. 2) generates an ordinary low-tension current and is provided with a low-tension distributer distributing the current to the individual plugs, according to the number of cylinders, so that only one low-tension wire for each plug is employed. The distributer disc is shown separately in Fig. 3, as well as the interrupter, which latter is provided for the purpose of timing the ignition.

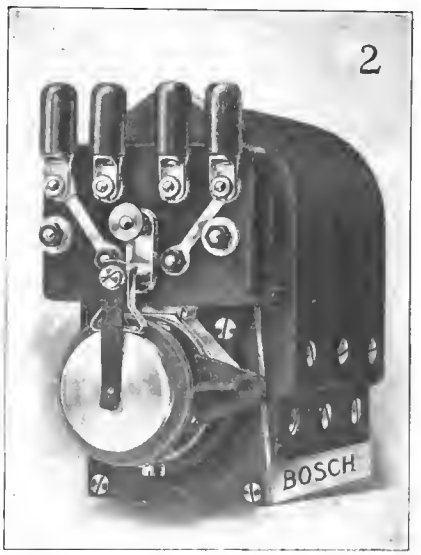


Fig. 2.—Low-tension Magneto with Synchronous Distributer.

Fig. 4 is a diagram of the electrical arrangements, which will be seen to be similar to those of the Bosch high-tension magneto. A portion of the wiring of the armature is short-circuited by the platinum points of the interrupter, and when the circuit is interrupted, the resulting armature reaction has the effect of raising the voltage of the armature sufficiently to operate the magnetic plugs. The rotating distributer bar is adjusted in such a way that it is always in connection with one of the spark plugs at the moment when the contact breaker of the magneto interrupts the circuit, so that the circuit to the plugs is closed and these are magnetized for operation.

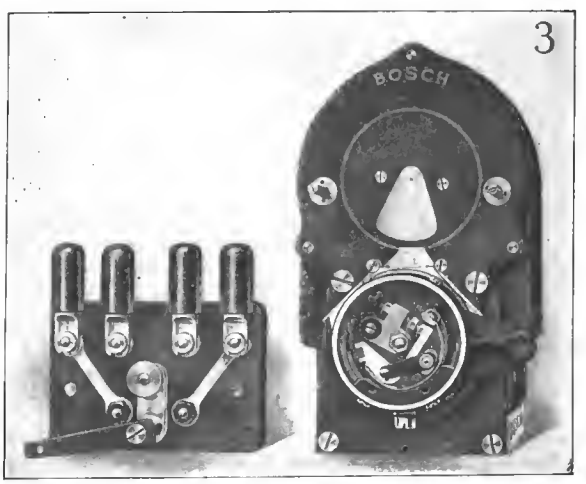


Fig. 3.--Details of Contact Breaker and Distributer of New Low-tension Magneto.

*Paper read before The Society of Automobile Engineers at Detroit, June 25-27, Third Annual Summer Meeting.

The spark is advanced or retarded by rotating the timing lever, in the same manner as with a high-tension magneto, and the timing range corresponds to an angle of 50 degrees on the armature shaft. The magneto is switched off in the same manner as a high-tension magneto, by making a ground connection. This is done by small plug switches with either a single plug or with a number of plugs equal to the number of cylinders, to enable each

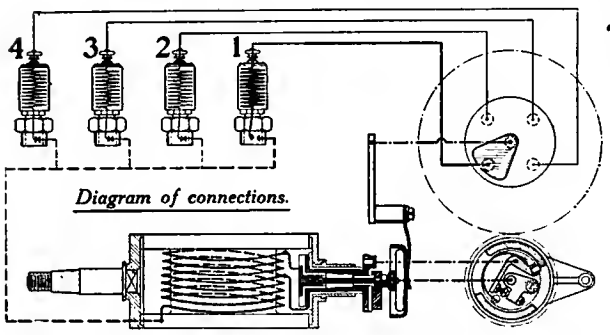


Fig. 4.—Wiring Diagram of New Low-tension System with Magnetic Plugs.

cylinder to be switched out separately for testing purposes, from the seat while the car is in motion. As compared with mechanically-operated igniters, electro-magnetic plugs are far simpler, and they are far more convenient, because they require no separate adjustment, as they are operated by the magneto itself.

Improved High-tension Systems.

During the past season dual systems of ignition have met with great favor among designers, especially among those who adhere to the high-tension principle. The author's firm has developed a synchronized dual ignition system, which comprises one of its various types of high-tension magnetos and combines the advantages of a *true* high-tension magneto and the coil dual system.

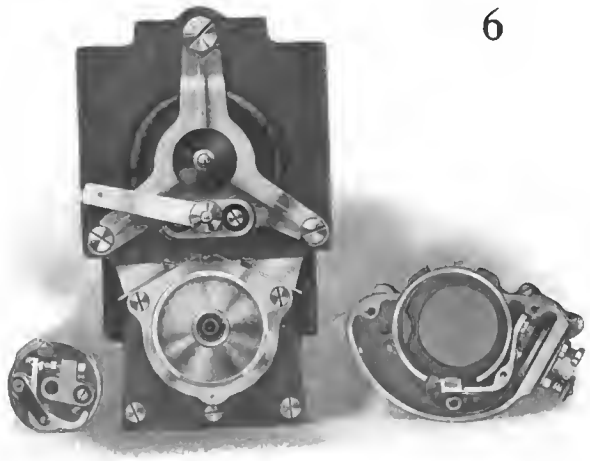


Fig. 6.—Showing Contact Breakers of Magneto for Dual Ignition.

The high-tension magneto, or the generator itself, differs from the standard rotary armature type in two respects only. In the first place, the high-tension connections are slightly altered, and, secondly, an additional contact-breaker for the battery is provided, as shown in Fig. 6, so that the magneto will serve also the function of a timer for the battery, while the one high-tension distributer of the magneto is used with both the magneto and the battery current. All other details of the magneto are similar to those of the ordinary machines, and it is therefore not necessary to describe them here.

For the battery ignition a special coil, as shown in Fig. 7, is provided, with a self-contained switch and a button for bringing a magnetic vibrator into circuit when desired. These various parts are all contained in a relatively small brass case, designed to be fitted to the dashboard, as illustrated in Fig. 8.

Contrary to usual practice in vibrator coil ignition, the vibrator in this new dual Bosch ignition system is only brought into operation for the purpose of starting the motor from the seat. As soon as the motor is working, the vibrator is cut out and the interruption of the current is effected by mechanical means. Consequently there is no lag in the operation of the circuit interrupter, as in the ordinary vibrator coil system, thus making a synchronized system. If there is any gas in the cylinder, the motor can be started from the driver's seat by simply pressing the button. The coil is of the general form of an *H* armature, as shown in Fig. 9, and not of the usual cylindrical form with concentric windings. It possesses the same amount of self-induction as the magneto armature, and while running the engine the two systems are absolutely synchronized, and no difference is apparent in the speed of the engine, whether the magneto or the battery is used.

Fig. 7.—Dash Coil and Self-contained Switch.

The trembler is only used at the moment of starting. The button switch for bringing it into circuit is fitted in the lid of the case in such a manner as to render it quite waterproof. In order to eliminate all long connections between the switch and the coil, the switch is directly combined with the brass housing of the coil, the short contact studs being well insulated from each other in the base of the housing. The connections are made by small segments in the bottom plate of the coil frame, the entire coil being moved towards the left or the right to effect the change-over. The switch handle projects through a circular slot in the housing and locks in three positions by a spring, the positions being designated respectively, as "Magneto," "Off," and "Battery." The combination is very compact and can easily be inspected by unscrewing the switch handle and removing the lid, when the coil can be taken out without disconnecting any wire, exposing the components of the switch.

The casing or housing being watertight and made of metal, prevents the coil being affected by atmospheric conditions. No wood is used in the construction. The connections between the dashboard and magneto, as shown in Fig. 10, are made by one quadruple cable, which contains the two high-tension wires and the two low-tension wires. Standard magnetos can be adapted to this dual system by only small alterations.

A New Small High-tension Magneto.

The great popularity of various light runabouts, and the growing use of the four-cylinder motor for such light vehicles, has of late created a demand for a small high-tension magneto outfit. Such a machine, suitable for four-cylinder motors up to 15 horsepower, is shown in Fig. 11. The chief *raison d'être* of this type of vehicle being its low cost of construction, its accessories

must necessarily be of low cost, and this point has been kept in view in the design of this magneto, though the electrical principles involved and the quality of workmanship are the same as found in the other high-tension magnetos of the Bosch Company.

This magneto is of the rotary armature type and must, therefore, be geared, for four-cylinder, four-cycle engines, to run at engine speed. The device is especially constructed with a view to enabling the layman to understand and use it, and the main parts can be removed without the use of tools. The parts of one of these magnetos are shown in Fig. 12. The interrupter is similar to the standard interrupter, but the distributer disc is of novel design and can be taken off with a jerk by pressing the springs on both sides. To simplify the ignition device, the magneto is generally furnished without any timing device. As these

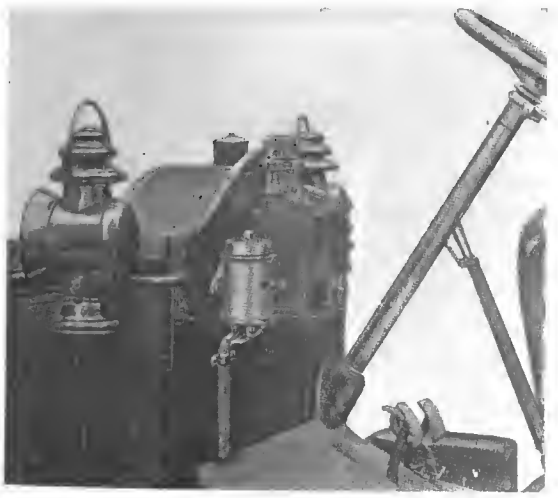


Fig. 8.—Relative Size of Coil Mounted on Dash.

magnetos will generally be used on small cars driven by persons with no special technical skill, the absence of a timing device has the advantage that the engine cannot be abused by incorrect timing. The magneto, however, can be readily supplied with a timing device.

Novel Coupling Device for Two-cycle Use.

On certain engines, particularly two-cycle and racing engines, an unusually large timing range is required. This necessitates the shifting of the magneto armature with respect to the driving

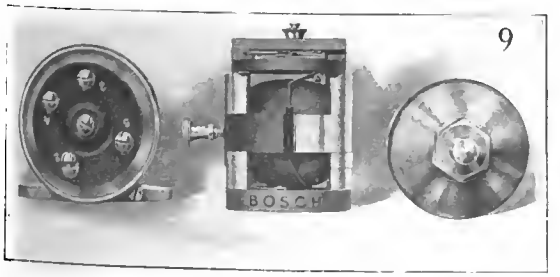


Fig. 9.—Components of Dash Coil and Switch Shown in Fig. 8.

shaft, which can be accomplished by a novel coupling device brought out by the author's firm. This coupling device, shown in Fig. 13, can be attached to practically any type of our magnetos. It consists principally of two rotary sleeves (as shown in Fig. 14), one fitting into the other, both provided with helical slots running in opposite directions, so that by removing the collar which carries pins which extend into the above-mentioned

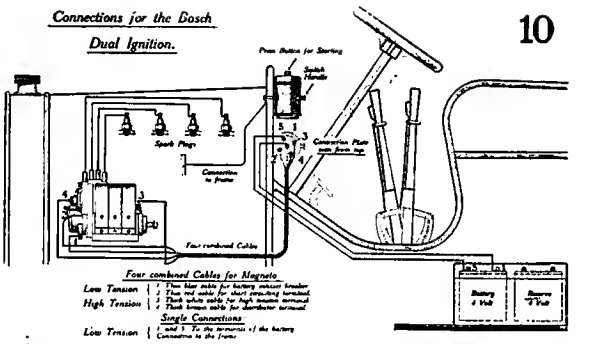


Fig. 10.—Wiring Diagram of Dual Ignition System Using Same Plugs.

slots, an angular movement of these sleeves relative to each other up to 60 degrees is obtainable.

In connection with the presentation of his paper on developments in magneto ignition that have been brought about during the past year or so, Mr. Heins, who has made a special study of the subject for a number of years past, and may well be considered an authority, also delivered an illustrated lecture outlining the development of ignition in the internal combustion motor since the latter first became a practical prime mover. The devices experimented with by Otto and Daimler and by many who followed in their footsteps were illustrated by means of lantern slides, and a complete review of this most important subject to the automobile engineer was gone through in a brief and interesting manner, the lecturer pointing out in a few words just where each inventor sought to improve upon the devices of his predecessors, and showing exactly how each one failed to realize in some important point or other the requirements of the problem to which so much study and attention has been devoted during the past quarter century. The subject is one of absorbing interest for every one connected with automobile engineering, and Mr. Heins' lecture brought out many points of interest.

Supplementary Paper Presented at Detroit.

After having dwelt upon the historical side of the question long enough to give an idea of what the present day ignition systems had been developed from, Mr. Heins went on to deliver a secondary paper of his own, which he had prepared on

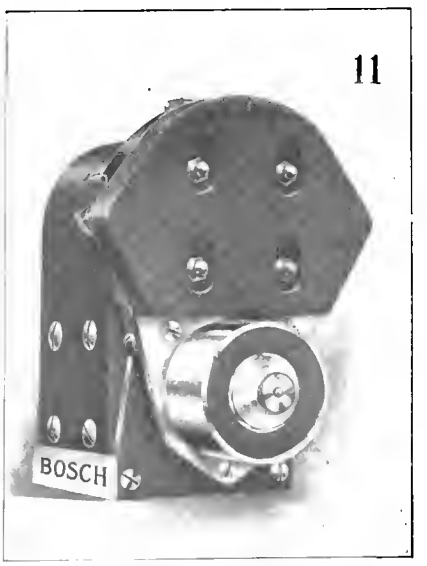


Fig. 11.—Small High-tension Magneto for Low-priced Cars.

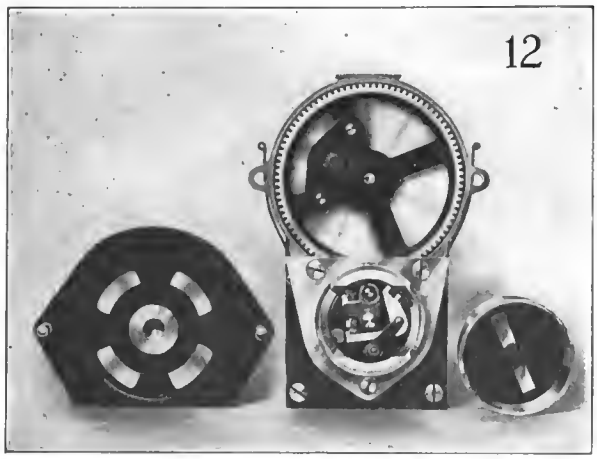


Fig. 12.—Distributer and Contact Breaker, New Small High-tension Magneto.

the subject since the submission of the illustrated paper which appeared in the Transactions of the Soeiety of Automobile Engineers, and which is being reproduced herewith. In this, he dwelt upon the purely technical side of the many problems that confront the automobile engineer in this extremely important essential of every gasoline car, and among the numerous lantern slides that were employed in connection with the lecture, many of them showed the electrical action of the magneto, giving its voltage and amperage under varying conditions as graphically illustrated by oscillographs. He also showed slides which had been reproduced by specially made photographs illustrating the difference between the spark produced by a coil system of ignition and by a high-tension magneto of the true type. The first of this series of photographs showed the appearance of the spark at 25 revolutions per minute, the photographic apparatus employed to take the pictures having been adjusted to run synchronously with the ignition apparatus, so that the results showed a true reproduction of the action of the two competing forms of ignition apparatus as compared with an accurate time factor. At the low rate of speed mentioned, the coil spark showed a solid line round part of the arc of a circle on the plate, but when increased to only a few hundred r.p.m., there was immediately apparent a very noticeable gap between each pair of the long series of sparks, and at high speed there was but a single spark, much reduced in intensity, and that occurred very late on the arc of the circle as compared with its original point, although the timing had not undergone any change. On the other hand, the magneto current recorded a substantial arc of light which was apparently not affected in the least by changes in the motor speed and which was unchanged in either timing of occurrence or power by the high rate of motor speed—as a matter of fact, there was a strengthening of the current owing to the much higher speed at which the magneto was being run, but this was not as plainly visible in the photographic reproduction as was the sudden falling off of the same element in the coil spark. Mr. Heins also compared the action of the true high-tension type of magneto with that of the magneto with coil high-tensicn type, in the same manner, showing the effect of the slight lag caused by the necessity of stepping up the current generated by the armature of the magneto to a high voltage in the independent coil. He explained the action of different forms of magnetos at some length and then went on to give a short review of the contents of the foregoing paper, descriptive of the improvements that have been made in the Bosch apparatus during the past year or more, and dwelling more particularly on what is without doubt the most radical advance made in this essential—that of the development of a satisfactory type of magnetic plug making it possible to employ a low-tension magneto without the necessity of the complicated igniter action that is now employed where the electric simplicity of this type is desired.

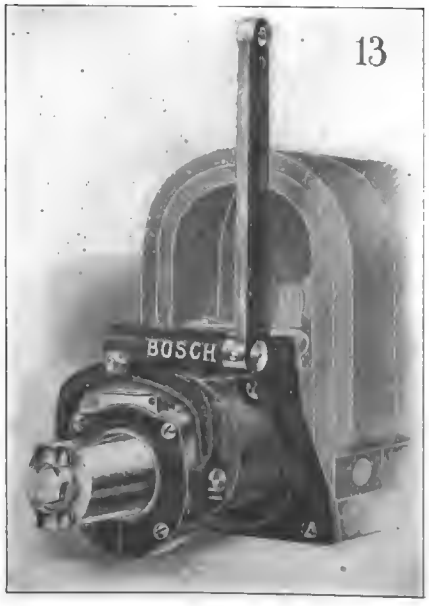


Fig. 13.—Coupling to Give Extreme Ignition Advance.

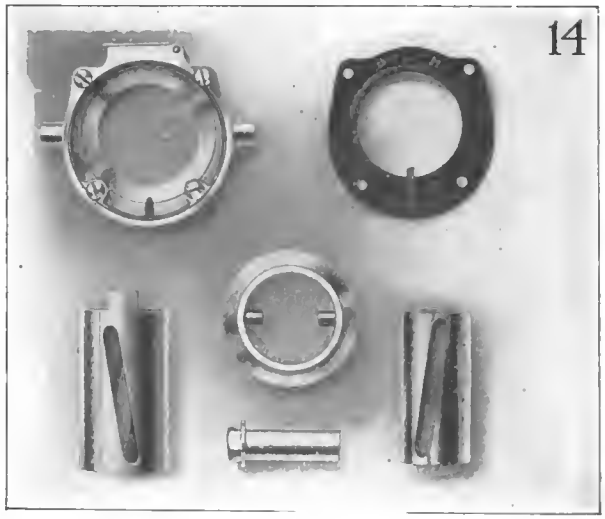


Fig. 14.—Components of New Bosch Coupling Device.

In referring to the new apparatus developed as the result of the past season's experience, special stress was laid upon the fact that, as far as it is possible to do so, both the magnetos and their accessories, such as the new coil switch for the dash, previously mentioned and illustrated, are so designed and constructed that they may be taken apart and readily reassembled without the use of any tools whatever, while their simplicity is such that they are not readily subject to reassembly with an improper relation of the parts when in the hands of even the most inexperienced autoist. The same tendency is noticeable in the case of the new high-tension magneto for small cars in that complication has been avoided by omitting the timing device.

NOTE.—Fig. 5 omitted.

LETTERS INTERESTING AND INSTRUCTIVE

BUYER LOOKS FOR HIS IDEAL CAR.

Editor THE AUTOMOBILE:

[1,446.]—I want to buy an automobile, when I can find one built somewhere near my notion. I am a subscriber to your valuable magazines and have watched the advertising columns, but have not yet found my car (all too heavy). The first safety bicycle I bought was in 1888; it weighed 114 pounds. To-day I have one that weighs only 34 pounds and is more flexible and stronger than the first mentioned.

I have had three automobiles and on account of their low power and heavy weight and unyielding construction they have ground out a small fortune in tires and repairs. Am now waiting for my ideal car. The following are suggestions for specifications: Six cylinders, 4 by 4 3-4 inches, engine and transmission on the principle of three-point support. Wheelbase, about 115 inches. Shaft drive with floating axle, springs semi-elliptic, front 2 1-2 inches wide and 50 inches long, rear side springs, 2 1-2 by 60 inches with cross spring at rear, all side springs nearly straight, with sufficient number of leaves under side to support load and one or two leaves on top to prevent excessive upward bounds. Wheels, artillery type, light construction for 36 by 3-inch quick detachable tires, body of light construction, side entrance, to seat four people. Bearings, Hess-Bright throughout; weight complete, not to exceed 2,000 pounds.

Will you kindly answer through your columns if there are any cars now made that will come quite near the above specifications. In my opinion, a car designed on above lines and kept within the 2,000 pounds would outsell any car on the market to-day.

Norwich, N. Y. C. W. L.

We do not know that there is any car on the market at the present moment that complies with your specifications in their entirety, and doubt very much if such a car is built, but there are some that approximate it in more respects than one. Every autoist of any experience has formulated a more or less clear idea of what he wants in the shape of a car, but as yet we do not know that any of these ideal cars have been built. If there are any of our readers who think they have cars that come sufficiently near to the requirements as above set forth, here is his chance to trot them out for inspection.

ANOTHER COMPARISON OF IGNITION SYSTEMS.

Editor THE AUTOMOBILE:

[1,447.]—Will you please answer through "The Automobile" the following questions? Would you advise purchasing a car equipped with make and break, using low tension magneto and jump spark plug battery ignition systems? Comparing make and break using low tension magneto, and jump spark using high tension magneto, what are the advantages and disadvantages of the different systems? C. A. LEWIS.

Chicago, O.

We would, where the advisee was inclined that way, just as we would advise an intending purchaser to invest in a car equipped with a high-tension system where he favored the latter. In the combined system you mention, the battery end is only used for starting, and practically all running is done on the magneto, although it is also possible to start on the latter by spinning the motor. To compare the two systems briefly, it may be said that the low-tension is simple electrically and complicated mechanically, while the high-tension system involves electrical complication with mechanical simplicity, but it would seem as if their differences were about to be merged by the adoption of a magnetically operated plug, using current from a low-tension magneto, this system having just been placed on the market. But even with the mechanism now required to operate it, we think the consensus of opinion is to the effect that the low-tension system is the more reliable. It is considerably more expensive to make than the average high-tension system, as the small parts of the ignitors and their operating mechanism must be made very accurately in order to give good service. The almost entire freedom of the low-tension system from electrical troubles is what causes it to appeal to many, while the lack of mechanical complication is a strong argument in favor of the high-tension system of ignition.

CONTROL BY SPARK OR THROTTLE?

Editor THE AUTOMOBILE:

[1,448.]—In our family are a '05 20-horsepower Stevens-Duryea and a '08 18-horsepower Stoddard-Dayton. The Stevens engine seems to speed up on the spark and the Stoddard on the throttle. On high the speed of the Stevens seems to depend on the spark and in the Stoddard the throttle. The timer on the Stevens seems to turn farther when advanced than that of the Stoddard. Does the carbureter make the difference, or what is it? If you would please answer I would be much obliged, as it is queer to run one with the spark high and the other with it low.

Waterbury, Conn. HOWARD P. HART.

You do not state whether either of the cars in question is equipped with a magneto or not, but from what you say, we presume not, and in this case the difference in running is to be accounted for by the factor of lag in the two ignition systems of the cars. According to popular impression, electrical action is absolutely instantaneous, or in other words, that the time intervening between the making of contact and the accomplishment of the desired result at the other end, is not a measurable period. This is far from being the case, for while electrical action is extremely rapid, magnetism requires an appreciable interval of time to manifest itself. The iron core of the primary winding of the coil must become magnetically saturated before it attracts the armature of the trembler, and both the inertia of the latter as well as the resistance of its spring must be overcome before the coil can act, so that there are no less than three factors that influence the time of occurrence of the spark in the cylinder. If the trembler spring is weak, there will be a further delay in rupturing the contact with a corresponding delay in the occurrence of the first high-tension impulse in the secondary winding.

If the spark is caused to occur exactly at the upper dead center, or a little before the piston reaches that point, then only the throttle will have any effect on the motor's speed, assuming, of course, that the ignition adjustment is allowed to remain as above stated. This is evident on several foreign makes of cars on which there is no provision whatever for advancing the ignition, the occurrence of the spark being retarded slightly for starting only. Such cars control on the throttle alone, and this would appear to be the case with your Stoddard-Dayton, a view that appears to be further supported by the fact that a greater range of timing is provided on the Stevens-Duryea. We think, however, that if you will always run the motor of the latter with the spark pretty well advanced, consistent with the work it is doing, you will find it possible to effect most of the control by means of the throttle, and you will then be getting a higher percentage of efficiency out of the motor, as the delayed spark wastes fuel and tends to heat the motor, owing to the slow burning. It will be evident that when ignition is taking place at the proper point, only an increase or decrease in the amount of fuel can have any effect on its speed and power. Advancing the spark only gives increased power of itself by permitting the motor to take better advantage of each charge of fuel. In other words, it is not adding to the power that can be obtained from a certain charge, but is producing a larger percentage of effective work from the same charge than where the spark is late.

WHAT IS THE SMALLEST ESSENTIAL PART?

Editor THE AUTOMOBILE:

[1,449.]—Will you kindly publish the name or description of the smallest essential individual part or piece of a car which goes to help make up the assembly of parts constituting the modern gasoline touring car ready for use. By essential I mean a part which, if removed from the car, would render it not usable.

Marshall, Minn. A. D. HARD, M.D.

This is a query the answer to which will depend upon the car itself. Assuming a single-cylinder car using high tension ignition, probably the platinum contact piece from the end of the trembler

screw is the smallest piece, the loss of which would render running difficult. It measures not much more than 1-16-inch in any dimension. It might be possible to run without it, but not satisfactorily, or for any length of time. The loss of the screw itself, which measures 1-2 or 3-4-inch across its circular top and is about 3-4-inch long by 1-8-inch diameter, would prevent running altogether. The loss of the locking nut from the needle valve of the carbureter might prevent any use of some cars, owing to the needle point turning very loosely. This is somewhat akin to the platinum contact point, as the car could be used, but the loss of the needle itself would prevent this and probably it is next on the list, although on some low-priced cars on which pinned joints are employed the loss of the pin from such a place as the connection of the propeller shaft to the universal would render the car useless until it was replaced. On a car using a high-tension magneto alone for ignition, the loss of the small carbon brush collecting the current from the primary winding of the armature would prevent the starting of the motor. This part is doubtless next in size to the platinum screw above mentioned. We are not certain that any of the foregoing comply exactly with the requirements of your definition of essential, individual parts, and they do not, if you mean by this a part complete in itself. In such a case, the loss of a spark plug from a single-cylinder motor would probably answer your query as well as anything. A little study of the question thus raised seems to lead to an endless number of possibilities and attention to the latter on the part of amateur autoists would reveal things about their cars the very existence of which they have never even suspected and would be the cause of their becoming very much more familiar with the machines they have been driving.

PREVENT OIL REACHING THE CLUTCH.

Editor THE AUTOMOBILE:

[1,450.]—Will you please give me some information in your department "Letters Instructive and Interesting"? I have a 16-horsepower touring car, planetary gear, leather cone clutch for direct driving, located in flywheel. Flywheel is not solid, but is spoked. I have replaced the leathers in the clutch once before, but not on account of the clutch slipping. Just replaced them when car was taken down because it was good time to do so. The leathers in the clutch are not old, but clutch will not hold. Slips all the time. I put in stronger springs, but this did not help. I think it is on account of oil from crankcase coming out through main bearing on flywheel side and getting in clutch through spokes of flywheel. Have tried everything. Carbids dust from gas generator, street dust, Fullers-earth, and Fullers-earth mixed with glycerine, all to no avail. Clutch will begin slipping again in less than two miles running after fixing it. If you can help me out same will be appreciated. R. S. TRULOCK.

El Reno, Okla.

No friction clutch can be made to hold where it is exposed to lubricating oil in any quantity and nothing that can be put on the facing will prevent the lubricating oil from causing it to slip. To remedy such trouble it would be advisable to attend to the end bearing of the crankshaft in order to prevent as much oil as possible from coming through there, as was doubtless the case when you got the car originally, and also to fill the spaces between the spokes of the flywheel with thin sheet metal or a similar oil-guard, unless the flywheel is meant to act as a fan, in which case it will be necessary to rely upon keeping the main bearing oil-tight.

CAUSE OF A KNOCK IN ONE CYLINDER.

Editor THE AUTOMOBILE:

[1,451.]—Kindly advise me through your "Letters Interesting and Instructive" what the trouble is with a two-cylinder opposed engine which runs smoothly on the high, but knocks in the front cylinder when the clutch is thrown out and gas and spark are retarded. Is this due to a loose part, and if so, where is it most likely to be found? Battery good, coil in adjustment, and no other trouble apparent. READER.

Milwaukee, Wis.

If caused by a loose part, this will most likely be found in the connecting rod or piston pin bearings, but from your statement of the case it does not appear to be trouble of that nature, as considerable looseness in these bearings will go unnoticed as long as the motor is run without load. If it were such a knock it would be most apparent when the clutch is in and the motor is driving the car, particularly on a grade. There may be something wrong with the adjustment of the ignition timing, by means of which the forward cylinder is caused to fire much sooner than the other, so that when the spark is retarded considerable back pressure is set up, which would account for it.

FRICTION-DRIVEN CARS IN HILLY COUNTRY.

Editor THE AUTOMOBILE:

[1,452.]—What has been the experience with friction drives for rough and hilly roads, such as are common in New Hampshire? I am told by almost everyone that they will slip, and are only good for fine roads. JAMES P. MELZER.

Milford, N. H.

This is something that we will have to refer to our readers for a definite answer, not having had any experience in the use of such a car in hilly country. It is well-known, however, that the friction transmission is an excellent type where the load is at all uniform or steady and that its chief drawback is not so much its inability to take care of an overload as it is to transmit an excessive load, suddenly applied, as in pulling the car out of a mudhole, or in starting from dead on a very steep grade. We understand, however, that manufacturers of cars employing this type of transmission have developed it to a point where it is unusually successful in situations for which it was formerly considered as practically valueless. Every car is equipped with a frictional element in some part of its transmission, namely, the clutch, so that it is not the use of friction for driving, but the manner in which it is applied, that constitutes the drawback. Doubtless some of our readers will come forward with further information gained from personal experience.

WILL SOME READER OBLIGE ON THIS?

Editor THE AUTOMOBILE.

[1,453.]—I would like to ask if any of your readers have tried the Holley 1908 "puddis" carbureter on the two-cylinder Autocar runabout and with what results? G. P. WELLS.

Fulton, N. Y.

We presume the inquirer refers to the Venturi tube type of carbureter made by this firm, in which there is always a small pool of gasoline present, no needle valve being employed, so that this carbureter functions for starting as a surface type and then brings the Venturi tube into action, so that we have taken the liberty of quoting puddle in the foregoing letter. Doubtless some information on this point would be appreciated by other readers as well.

AUTO PAPERS PUBLISHED ABROAD.

Editor THE AUTOMOBILE:

[1,454.]—Kindly tell me the names of some French and English automobile papers; also what language they are printed in, and if they are illustrated, in "Letters Interesting and Instructive."

McHenry, Md. H. T. CHITTENDEN.

The *Autocar, Automotor Journal, Motor* and *The Car* are among the leading English automobile papers; all are printed in English and are profusely illustrated. Any of them may be reached by addressing them at London. *Omnia* and *La Vie Automobile* are the leading French papers, are printed in that language and are well illustrated. *L'Auto* is a daily published in the usual daily newspaper form. All are issued in Paris.

CHEWING GUM AS A RADIATOR REPAIR.

Editor THE AUTOMOBILE:

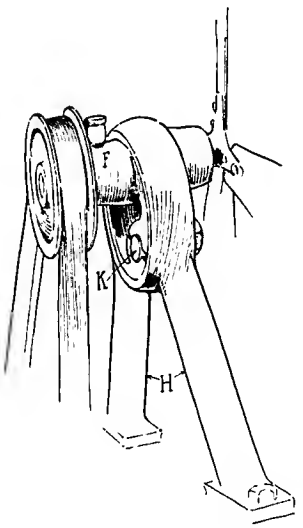
[1,455.]—Referring to your "Letters Interesting and Instructive" about repairing radiator leaks, I agree with you that there is no practical way to make a permanent repair except having it soldered by a competent repair man. I have, however, made temporary repairs which have run nearly a whole season without leaking, by the use of ordinary chewing gum (the pepsin or tutti-frutti kind); pressing it over the leak like putty.

This has the advantage of stopping small leaks for a time without filling up the circulating system like bran or flour.

Lebanon, N. H. CHAS. S. DAVIS.

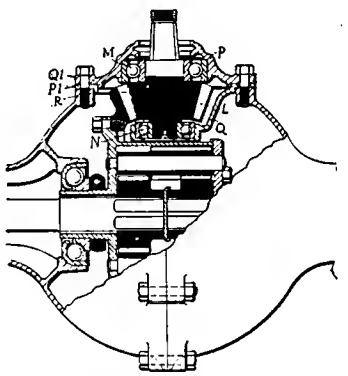
AMONG THE AUTO FACTORIES OF INDIANAPOLIS

INDIANAPOLIS, IND., June 29.—There are seven factories in Indianapolis directly interested in making motor cars, and a host of others which manufacture essential parts and accessories. Of these factories one has been running a night force since last October and through the thick of the money flurries; while the resourceful executive of another concern, having found a small plant insufficient for its ever-growing needs, has resorted to the use of tents to help out the cramped floors, with the result that members of the firm are not infrequently rallied to reveal the day's output of available factory space. Nearly all of the remaining plants are busier than their capacity normally warrants, so that the explanation of the "smiles that won't come off" is not far to seek.



Fan Adjustment of Premier.

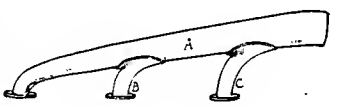
Almost every conceivable school of motor car practice is represented. The new Premier may be justly described as the machine of standard practice par excellence. The firm's latest motor is as neat, as refined and as representative of the best in engine construction as any motor in the world. There are many things about this particular engine which are very interesting, and of them, before entering into details, mention must be made of the employment of low-tension ignition. The use of a low-tension ignition system by a new firm, or a firm whose production had hitherto been very limited, would not be so remarkable, but its adoption by a concern which previously had sworn by a high-tension system is a change in essential practice deservedly claiming attention. The origin of the change of ignition system was the adoption of a six-cylinder model.



Premier Rear Axle Support.

The Premier experience with high-tension systems in conjunction with the six-cylinder motor, particularly at high speeds, led them to search for a practice which, while of especial simplicity, would nevertheless be independent of engine speed for its efficiency. The present make-and-break system is the result and is a fine example of the scientific mechanic's art. In general principle it is an ordinary make-and-break operated by horizontal cams, the plugs being located in a valve cap of either cylinder. So far it resembles the practice of two well-known foreign cars—the Itala and the Weigel—but its essential difference lies in the action series of the hammer motions. In the two cars mentioned a circular cam has a depression formed in its profile against which the hammer-operating lever is caused to bear by means of a tension spring, the spring being connected to the fellow operating lever of the adjacent plug, which bears on an entirely similar cam. The action in this case is as follows: The cams, having a circular formation, merely sustain the hammer lever against the action of the spring until such time as the depression is reached. Then the hammer lever drops until contact is made within the cylinder, directly after which, the end of the depression being reached, the contact is broken and ignition occurs, the circular portion of the cam resuming its function of holding the hammer arm out of contact.

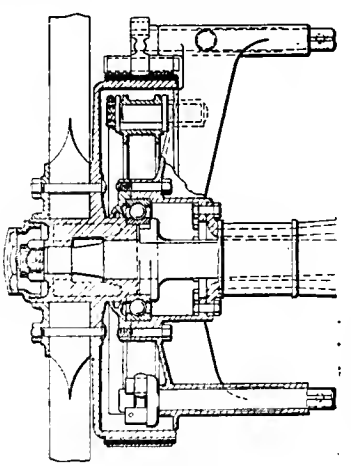
In the Premier system the general arrangement is identical with the difference that the spring is utilized to break the circuit after the cam has caused contact to take place. In order to render the making of the circuit sure and to provide for slight inaccuracies of setting, and also to compensate for possible wear, the Premier has developed a very pretty "automatic take-up," which is illustrated. As will be readily seen, the hammer lever is made up of two pieces, the one in rigid connection with the hammer proper and the other pivoted about a sleeve formed by extending the boss of the above-mentioned lever. Inspection of the illustration shows these levers at *A* and *B* respectively. Lever *A* has an open jaw formed at its free end which corresponds to a block section formed in lever *B*. The jaw on *A* is slightly wider than the corresponding portion of *B*, so that the lever *B* can move relative to the lever *A*. The small spring *S* causes the lever *B* to lie snugly against one side of the jaw on *B*. When the cam *C* revolves it is obvious that it will move the combination lever made up of the levers *A* and *B* until contact is made within the cylinder, after which any further movement is taken up by the clearance between the lever *B* and the jaw on *A*. It is easy to see that by setting the plug initially so this clearance is absorbed, or nearly so, that wear to the amount of the clearance must take place within the cylinder before resetting is called for.

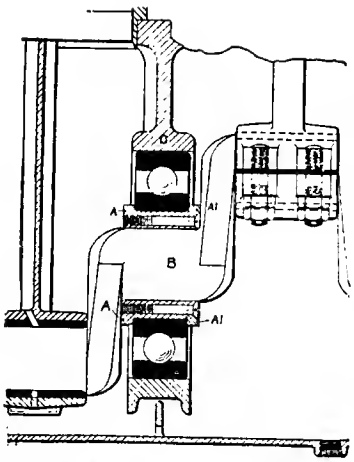


Water Pipe of Premier.

Care in Ignition Workmanship.

The system is especially ingenious and equally effective; not that the effectiveness shown by it in practice is due so much to the design of the plug but for the reason that many of the manufacturers of low-tension ignition systems forget—perfect workmanship. At the Premier plant a small department has been created to manufacture these low-tension plugs, and it is equipped to turn out only the highest quality of work. Finishing of opposed working parts is accomplished by means of crocus powder lapping, and the most rigid inspection is maintained. The particularly impressive

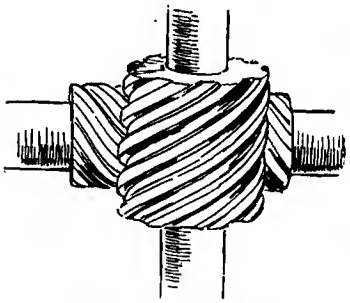

Premier Brake Construction.



Ball Bearing on National Crankshaft.

point is that the hammer and anvil points of the plug are actually liberally tipped with iridio-platinum inserts. One had begun to forget such things in these commercially hard manufacturing times.

The Premier factory management certainly understands the relation of a dollar to a dollar's worth. It does not spend any unnecessary money at that plant, but what it does spend has had such a foundation laid in the way of jigs and tools that it is not difficult to maintain a high production rate. It would be impossible to enumerate the thousand and one kinks found there, but one or two examples may be interesting. For instance: The Premier people use a cast gun iron crankcase. Another point which is interesting from a manufacturing standpoint is the way in which the water pipes are made up. Most people know that a sheet metal double or triple taper water pipe for the head of an engine is not the cheapest or easiest thing in the world to make. The taper part is easy enough, and the bend at the small end. but the remaining inlets are difficult and costly if made by the coppersmith. The Premier factory makes the taper tube *A* and the single bend and uses castings *B* and *C* for the remaining cylinder leads. Another kink is the way in which the lower half of the crankcase is made up. A gun iron frame *D* is covered with sheet steel *E* riveted into place. The composite job is as light as an aluminum casting and has certain obvious advantages of its own.



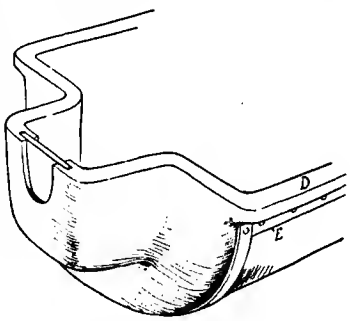
Premier Spark Advance.

System Above All.

The importance of perfection of the handling system is a point which hardly appeals to the average business man, but there are comparatively few people who realize—even though they be salesmen directly connected with the motor car industry—the extraordinary number of parts there are in the modern multi-cylinder machine. If, however, they do realize that the details are numbered in the thousand, they will begin to appreciate the thoroughness with which the organization must be carried out in order to avoid overhead and dead changes eating into the legitimate profits. In the Premier factory the systems are particularly effective, and although not especially novel are exceptionally well operated. The stock room—a general source of indefinite information at the end of the financial year in only too many plants—is most thoroughly safeguarded from unrecorded inroads. This digression must be looked upon as the natural sequel to a description of a few of the neatly economical kinks which have already been considered in this connection.

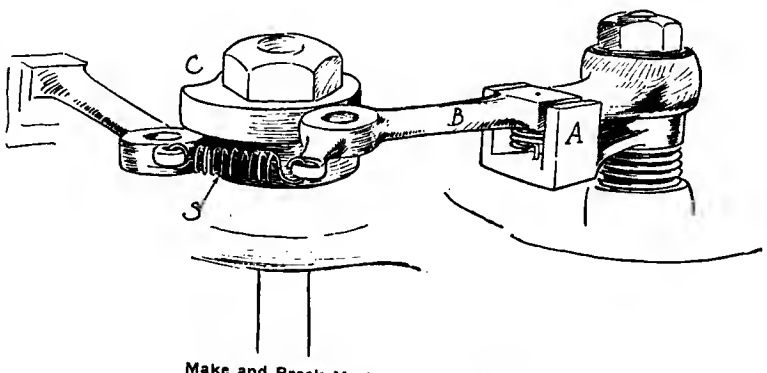
To return to technicalities, the fan adjustment of the Premier is soundly designed and comes as a distinct relief from the various twisted hoop iron crudities which are only too frequent. It consists, as a glance at the illustration will show, of an eccentrically formed sleeve carrying the fan spindle *F* and its bearings mounted in a bracket *H* bolted to the forward end of the crankcase. The fan pulley is for a V belt and is remarkable in this respect; but the neatest thing about the construction is the means adopted to retain the adjustment of the belt tension. The eccentric about the bearing sleeve is split with a saw cut, this dividing a taper hole. A taper pin *K* is located in this hole and can be drawn down by a nut. The act of tightening the nut causes the eccentric to expand within the bracket carrying it and so lock itself frictionally in position.

Probably the Premier rear axle contains the greatest novelty in the car. This is a semi-floating type, on Hess-Bright ball bearings, and in respect of being semi-floating alone is remarkable, but apart from this point there are some details as clever as they are novel. One of the best of these is the way in which the bevel driving pinion *L* is supported by ball bearings at the base *M* and the apex *N*. The saucer-like castings *P* and *O* are used; dished diversely, each having a circular flange. These circular flanges register together and are in contact when assembled; within the space between the two lies the driving pinion *L* supported fore and aft by Hess-Bright ball bearings *M* and *N*. The coincident flanges *P*1 and *Q*1 also register with a similar flange *R* formed by the axle castings so the assembled pinion housing bolts right into place and completes the axle housing assembly. The inner saucer-like casting *Q* is cut away for about a quarter of its circumference through the dished wall, this opening permitting the meshing of the housed pinion with the driven bevel gear. It is just a feature of this axle design that everything on it is circular, but it is one of those features that permit one manufacturer to turn out a high-class job at a reasonable price, while another gets out badly with a less efficient though more complex system of handling.

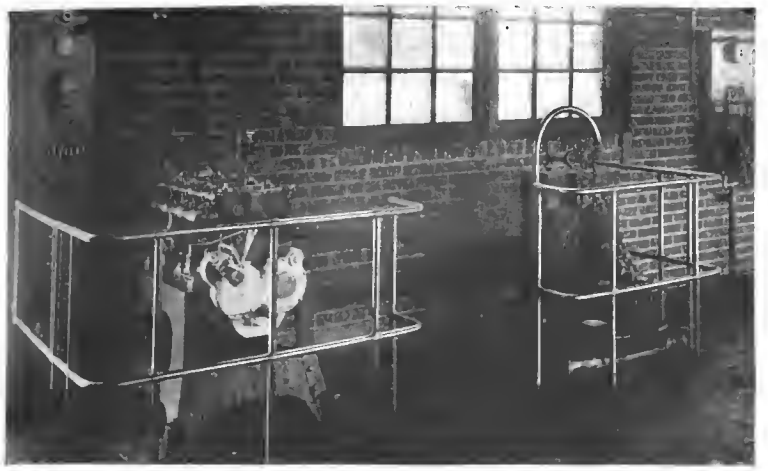


Premier Crankcase Construction.

In one or two factories they have the design and production so schemed that rapid and accurate work is not only possible but difficult to avoid doing. In others, notwithstanding elaborate jigging, much money is sunk unnecessarily where the designer might have accomplished much by a variation of a decimal of an inch in a facing, a bore, a flange, etc. And it is noticeable.



Make and Break Mechanism of the Premier.



National Motor Used for the Generation of Electricity.

too, that simplicity, rigidity, cheapness in the shop and efficiency invariably go together, as they are all but the results of a modern system of manufacturing automobiles or other machinery.

A Thorough Testing Scheme.

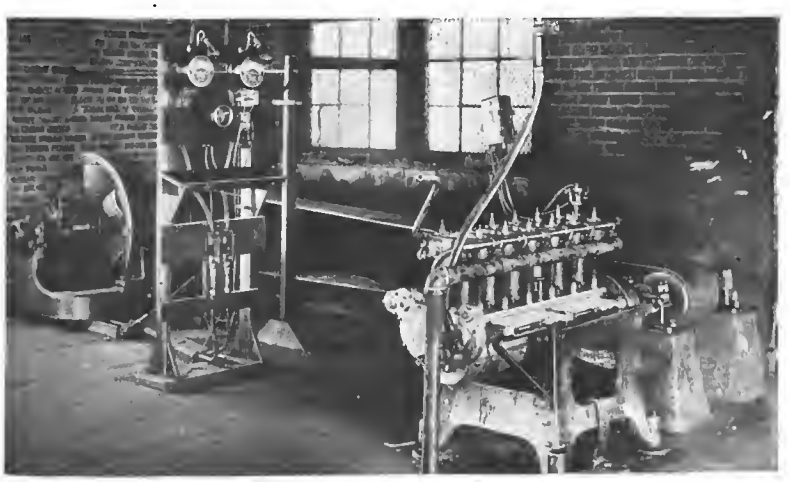
To go back to the Premier factory, however, and the things done there, there can be no better indication of the policy of the firm than the thoroughness of the testing. There is none of the slap, dash, that's good enough system that is found once in a while even among manufacturers selling high-priced cars. Each and every engine, four or six, is run first as a dummy, then light, and lastly has to stand a steady pull at overload for a fixed time. What is more, the system is lived up to thoroughly—there is no question of bye-and-bye. The engines have to pass the full test before they get to the assembling floor—rush or no rush. Then the chassis come out and get to the road testers, who set a strenuous pace. Not that this phase is peculiar to the Premier testers—the National, the American, the Marmon and the Overland all do the same, and inasmuch as there is very healthy rivalry among the testers of the various Indianapolis factories, there is no doubt that the road testing is thorough, though the speed laws outside the city limits may be annihilated at times.

National Car All Made in Home Plant.

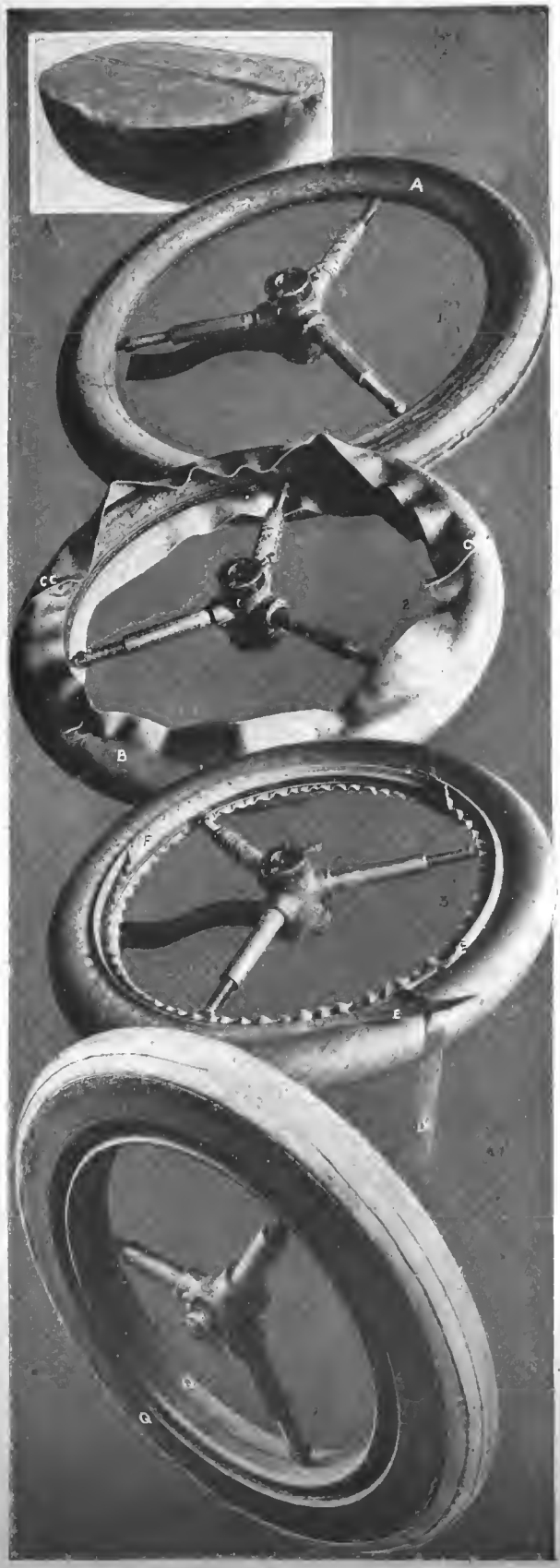
So much for the Premier line of automobiles. At the other side of the city lies the main plant of the National company, which by the way, possesses two, one—that already mentioned—where the chassis work and assembling is done, and the other, where the engines are built and tested. The former is quite a large place, fully and busily occupied. With the manufacturing end of the product well along, interest is centered upon the assembling floors, and here exceptional activity can be noticed. They build three models in the National plant, build them from stem to stern, and it is not hard to realize that with these moving through the plant the organization work has to be made more comprehensive than where only one or two models with entirely duplicate parts are the standard product.

As no doubt many of THE AUTOMOBILE's readers know, the National company has many especial points of interest in its 1908 engine, among which not the least must rank the use of Hess-Bright ball bearings on the crankshaft. The use of radial ball bearings on a crankshaft is a practice which, having been developed abroad, is used by but few people on this side of the Atlantic. The reasons for this are twofold: Firstly, the construction is necessarily expensive, and, secondly, apart from the expense of the ball bearings, there are some engineers who do not approve the practice. Opinion in this direction appears to be very evenly divided, and there is no doubt that where ball bearings are used freedom from lubrication trouble and extraordinary accelerative properties are attained. Moreover, in the case of a six-cylinder engine it permits of a shortening of the over-all dimensions, and, apart from any mechanical advantages derived, this shortening of the engine, even though it be a matter of a few inches, is quite important, as it permits a reduction of wheelbase—the bugbear of the six-cylinder machine. The National company uses what is known as the "threading system" and secures the bearing of the shaft by means of split sleeves. The bearings employed have a bore sufficiently large that they can be passed along the shaft, the collets being removed to render the necessary diameter of bearing as small as possible. In order to secure the bearings to the crankshaft a split foundation collar *A* and *A*1 is used, which when assembled corresponds to the bore of the inner race of the bearing. This collar is located positively with the crankshaft *B* and it is impossible when the bearing is in place for any derangement to occur. The bearings being assembled on the shaft, it is necessary to make sure that the shafts are quite straight after the handling, and in the National engine plant the straightening is done with the help of a very ingenious device. They are then ready for placing in the crankcase and it is very noticeable in National practice that the ball bearings are located directly in the aluminum *C* of the crankcase without the use of intermediate hard metal cages.

There are a number of other ingenious devices for labor-saving purposes which indicate how closely the National executive keeps after its factory costs. Prominent among these is a row of valve-grinding machines which will handle the most refractory valve-seating job in about one-twentieth the time it can be done by an expert mechanic by hand. However, as usual with factories making their own engines, the engine testing room is the pride of the National plant.



Testing One of the National Six-cylinder Motors.



THE MAKING OF G & J TIRES.

The manufacture of a pneumatic tire is undoubtedly one of the least known operations and processes in connection with the motor car. The public is familiar with the making of castings as well as the finishing by grinding and machining, but is decidedly unfamiliar with the manufacture of a pneumatic tire. Due to the kindness of the G & J Tire Company, Indianapolis, Ind., THE AUTOMOBILE this week is able to show eight stages in the process of manufacturing tire casing, each of these being illustrated by reproduction of photographs specially taken in the G & J factory.

The rubber used in the manufacture of any standard motor car tire is composed largely of the Brazilian product, principal among which are those varieties known as para rubber. The three most popular grades of this rubber are fine, medium and coarse, and are obtained principally from the territory covered by the Amazon and its tributaries. The rubber mostly used at this plant is fine para, which in itself has many classifications, but has in all its various grades a very uniform quality. It is usually shipped in the form as shown in illustration A, which is known to the trade as a rubber "biscuit." On arrival at the factory these biscuits are placed in large vats of hot water in order that they may become slightly softened before the washing process is begun. They are then placed in the washing machines, which are built of spirally corrugated rolls, and are passed through these many times with jets of water playing on the rubber the whole time, thus removing any foreign substances that may have been picked up with the rubber, and at the same time sheeting out the rubber into long thin sheets which, when thoroughly washed, present a spongy, porous appearance. These sheets are worked down to a thickness of about 1-16 of an inch, so that the greatest possible surface of same may be exposed to the air.

Illustration B shows these sheets in the process of drying. The rubber is taken from the washers to the dry-room and is allowed to remain there until every element of moisture is absorbed therefrom. Usually this process will take from six to seven weeks, and care has to be exercised to prevent the rubber from becoming overdried, and oxidizing. Before the rubber is compounded, an expert goes through the dry-room and carefully selects from his rubber the kind and grade that is most particularly adapted for the special requirement that he may have for same.

The rubber is then taken to the compound department, where certain inorganic substances are added to it, so that the necessary gravities and vulcanizing ingredients may be provided for. From this department it is turned over to the mill room, and in the process of milling all these various ingredients are evenly distributed, and the whole is kneaded into a soft plastic state, which enables the calender man and tire builders to handle same. By a process of calendering, the friction gum is evenly distributed on a specially woven fabric, made from selected sea island cotton of long staple and great tensile strength. The meshes of this fabric are filled during this process with the gum composed entirely of fine para—and a series of small rubber rivets are thus formed which unite the various layers of fabric together during vulcanization into one compact and homogeneous mass. Great care is exercised during this process to prevent the fabric from becoming strained either in the warp or filler, the idea being to retain to its fullest extent the tensile strength of the fabric.

The fabric thus treated is in rolls varying from 110 to 120 yards in length, which, after being calendered, is taken to the cutting room, where, according to the sizes of tires required, it is cut into strips of varying widths.

Now comes the manufacture of a tire. The rubber is by this time ready for the tiremaker, who has at hand a cast-iron core A, Fig. 1, on what is technically known as a buck and spider, being a swinging arm which permits of readily moving the cast-iron core A in each direction. Before starting the manufacture of a tire, the core A is thoroughly cleansed and dried, after which it is covered with the first coating of a rubber solution.

The tiremaker having prepared a strip of fabric B, Fig. 2, made of closely woven sea island cotton and impregnated with pure gum rubber, cuts a series of strips from this on the bias and stretches them tightly over the core A, the illustration showing the diagonal joining in the strips B at point CC. It would appear that trouble would be incurred in having the fabric lie closely and smoothly around the core A, but owing to the bias cutting the workman is able to roll it down without difficulty until perfect conformation with the core is secured.

Having covered each diagonal joint of the fabric strip B with a film of pure rubber, he applies a second layer of fabric identical with the first and then after lining the inner edge of the embryo tire with a pure rubber strip D, Fig. 3, he proceeds to insert the clinch or bead E. This is made from many strips of fabric varying in width previously built, rolled accurately to shape, and semi-cured—that is, partially vulcanized. The clinch is immersed first in rubber solution and is then fitted as shown with a diagonal overlapping joint. When in place, the second fabric layer is turned up over the clinch as seen at F and then with a roller knife the workman trims it to half the depth of the bead as at G.

According to the size of the tire to be made, varying numbers of layers of fabric are used. That applied after the insertion of the clinch is cut so that when finished the overlap at the bead matches the reverse overlap we have seen at G, Fig. 3. The completing layers of fabric are carried right to the inner edges of the tire beads. The fabric foundation being complete, the cushion stock, as the tiremakers call the first rubber layer, is put on. The neck of the section is first covered with the narrow pure gum strip H, Fig. 4, and then the wide rubber sheet I is laid and rolled into place. The rubber used to this stage of the construction is as pure as possible.

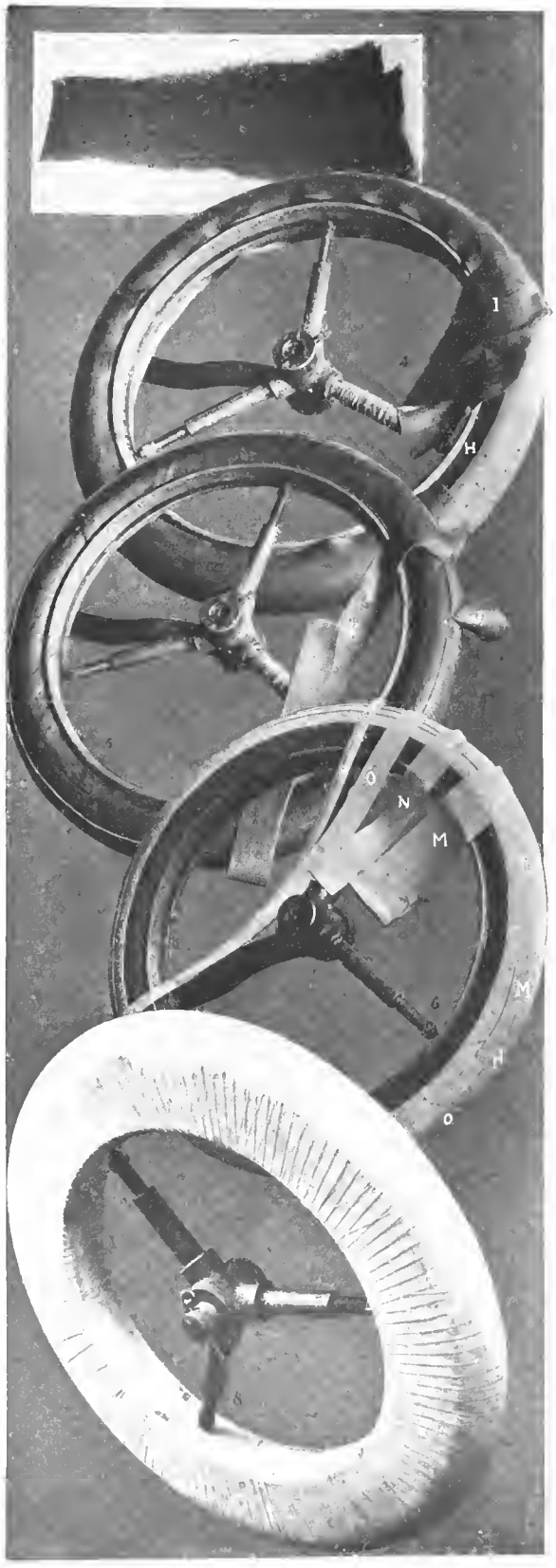
Having laid the "cushion" stock, the "breaker" strips, J and K, Fig. 5, are applied. These consist of rubber-impregnated fabric of coarser weave that the material used in the foundation, but cut so that the direction of the warp of the material is along the tread of the tire instead of diagonal to it as with the fabric used in the building of the carcass. Strip J, Fig. 5, is finer in weave than strip K, but each aids the other in providing strength for the tire in the direction of its future motion. Functionally, the breaker strips are used to reduce the strain on the tire body. The joints in both breaker strips being duly covered with pure rubber film, the laying of the tread is commenced.

The tread consists of compounded rubber—that is, the pure gum mixed with sulphur and other inorganic materials destined to increase its resiliency and durability—and is built up of strips of varying widths. The tire of the picture uses five to its tread composition, seen variously at L, Fig. 6, completely laid, and in order of decreasing width at M, N, O and P, respectively. Each strip is rolled separately into place and then copiously pricked to permit the escape of any air possibly remaining between the layers during the subsequent curing process.

The tiremakers' task is now nearly complete. The last function of the builder is to clamp on the heavy cast-iron flanges QQ, Fig. 7, and draw them together with bolts. The object of these flanges is to insure the accurate shaping of the bead and to obviate any possibility of distortion or wrinkling of the fabric during the vulcanizing process.

The last step in the constructional operations before ingenious labor makes way for the magic of the chemist is the wrapping of the tread, Fig. 8. This is done by machinery and a wetted cotton bandage R is used, being wrapped radially about the tire form. The drying of the already tightly stretched bandage in the curing chambers causes great pressure to be evenly exerted on the tread of the tire, thus materially aiding in the consolidation of the rubber composing the tire. The vulcanizing or curing process carried on at a high temperature causes each rubber layer to so closely identify itself with that with which it is in contact that it is afterward impossible to trace the lines of coalition.

Owing also to the rubber flowing during the vulcanizing process, the finished product, fabric rubber clinch and tread are homogeneously and inseparably welded together in a permanent bond.



RHODE ISLAND'S NEW LAW PRETTY NEAR "THE LIMIT"

PROVIDENCE, June 30.—With the avowed object of securing the protection of the motorists in Rhode Island by securing the enactment of just laws governing the use of the highways by all vehicles, and to prevent, by legal means, discrimination against users of motor vehicles and their unjust prosecution, a second association of automobilists has been formally effected in this city. The officers of the new league are George H. Huddy, Jr., president; J. S. Gettler, secretary, and George C. Arnold, treasurer. Mr. Huddy is the assistant United States district attorney.

The organization of the league was the outcome of the new law passed a few weeks ago in this State, in which the owners of automobiles were taxed according to the horsepower, and the entire matter of licensing the machines was taken from the Secretary of State and placed in the hands of the State Board of Public Roads.

It is about as unpopular a bit of legislation with the drivers and owners in this State as has been passed in New England.

The law was framed by members of the General Assembly, largely composed of members from the rural districts, and in spite of strenuous objections from owners of cars in this and other cities features were incorporated which it is believed are unconstitutional.

Heretofore certificates of registration and numbers for the machines were issued by the Secretary of State upon the payment of a nominal fee, but it was argued by the members of the General Assembly, a majority of whom are from towns in which there are few resident owners of automobiles, that the fast-driving of the cars was the cause of destroying the macadam roads. They urged that the larger and more powerful the car the greater was the damage, and incorporated in the law not only a speed limit of 15 miles an hour, but also provided that each car should be taxed in proportion to its horsepower.

The entire matter was placed under the jurisdiction of the State Board of Public roads, with instructions to the owners of automobiles to take out new licenses and secure new numbers. This many of the owners have thus far neglected to do, and the State Board of Public Roads has already sought the assistance of the police in the several cities and towns to aid them in enforcing the law.

At a special meeting of the Rhode Island Automobile Club for the purpose of discussing the new law, Colonel Frank W. Tillinghast, a prominent attorney and himself an enthusiastic automobilist, expressed the opinion that the registration fee as provided for in the new law should be paid by the owners of the cars under protest. He urged the members of the club to accompany the registration fee with a written protest, so that the money would be returned in case the test case which is now before the court, should result in upholding the contention of the owners that the law is unconstitutional.

It was the unanimous opinion of those present that if the authorities were to insist upon the wholesale "honking" of horns at every cross street it would become such a great nuisance that the public would rise up and protest. These horn regulations have been branded as unreasonable and obnoxious, and it was the general opinion of those present at the meeting that the drivers of the machines should run their cars so that there would be no necessity for constant "honking" and clanging of bells.

The test case to try the constitutionality of the new law was begun when a deputy sheriff served the members of the State Board of Public Roads with writs in the case of Jefferson K. Crafford, who has filed a petition with the Supreme Court for a writ of mandamus, ordering the board to furnish him with a certificate of registration for his automobile.

The case is backed by the Rhode Island Automobile Club and arose through the refusal of Mr. Crafford to pay the registration fee of $15 to register his automobile. The test case will be watched with interest, as it questions the constitutionality of the new law in many features, particularly on the ground that it imposes double taxation.

RECENT CHANGES IN MASSACHUSETTS AUTO LAW

BOSTON, July 1.—Automobilists or motor cyclists who contemplate touring in Massachusetts on or after the 12th of this month should take into account the new law which was passed by the legislature recently adjourned, and which goes into effect on that date. While the act makes no very radical changes in the motor vehicle laws, it does make certain changes of which tourists should be aware. Two new punishable offenses are specified, and the power of the highway commission is much strengthened in the matter of suspending and revoking licenses. The act was originally drafted by the Safe Roads Automobile Association. After being heard by the committee, certain changes were made at the suggestion of the highway commission, and the bill was much mulled over in the committees, being passed only during the last day or two of the session.

To autoists from outside the State, who are just now coming into Massachusetts in large numbers, a section of the new law is particularly important. The non-resident who has complied with the laws of his home State may still drive in Massachusetts seven days without taking out a Massachusetts registration. He must, however, drive himself, as the law does not make provision for the operation of such a car by a chauffeur. But if a non-resident driving in Massachusetts during the seven days' limit is convicted of violating any provision of the automobile laws, whether or not he appeals, he must thereupon have his car registered here and secure a license, thus placing his car and himself under the jurisdiction of the Massachusetts highway commission. The courts are required to send records of the convictions of non-residents to the highway commission.

The new law enlarges the powers of the highway commission in several directions, most important perhaps being the provisions which constitute the commission an investigating body in relation to accidents. It is specifically provided that the commission may summons witnesses, administer oaths and take testimony, thus making it to all intents and purposes a court. Whenever the death of any person results from such an accident the commission is required forthwith to suspend the license of the operator, and must revoke the license, unless, upon investigation or after a hearing, it determines that the accident occurred without serious fault upon the part of the operator. If a license is revoked it cannot be renewed for at least six months.

Another change in the law of interest to automobilists made by the legislature which has just adjourned is the putting on the statute books of the law of the road. This law reads: "Whenever on any bridge or way, public or private, there is not an unobstructed view of the road for at least 100 yards, the driver of every vehicle shall keep his vehicle on the right of the middle of the traveled part of the bridge or way, whenever it is safe and practicable so to do." The penalty is a fine of $20 and liability in an action commenced within twelve months of the violation. The legislature also passed a law for the codification by the highway commission of the automobile laws, the commission to report the 1st of next January.

Recent Progress in Highway Improvement in Pacific Coast States

by James W. Abbott.

Part III

One of the Beautiful Boulevards of the City of Los Angeles, Cal., That Has Been Treated by the Petrolithic Process.

IN the first of these articles I showed how Washington and Oregon are solving the problem of ways and means. In the second I showed how California is solving it. In this I will try to indicate something of the progress which California has made in methods, and how California, in my judgment, is going to give the world new lessons in road construction, so that when that international congress which has been called by the government of France shall meet, and the United States is asked for its report, California may arise and say, "Eureka!" And so all the rest of the nations may concede that California *has found it.*

The first innovation, to which I shall refer but briefly, relates to the paving of city streets where the traffic is the heaviest, and where hitherto no construction has been devised which shall be adapted as well to the needs of the heavy dray as to those of my lady's automobile or the children's pony cart.

A gentleman of Los Angeles has invented a process by which he hopes to take a soft, common brick, the cheapest kind we now use in building houses anywhere, and convert that brick into a hard, tough, durable unit which, when laid in a pavement, shall make a homogeneous street covering which will not crack, will not crumble, will not rot, but which at the same time will furnish a sure footing for horses, be resilient beneath their feet, and will be the ideal pavement for an automobile.

It seems incredible, I know; but months ago there was laid upon the busiest streets of Los Angeles, where the teaming is heaviest, ten feet of a sample pavement constructed with brick of this character, and, so far as I could judge, the brick has made good. That brick is not on the market. Its inventor has refused to give me particulars, saying, "We are not ready. There is much for us yet to learn. We are satisfied we are on the right track. While I should be delighted to have you the first to tell the world of this wonderful invention, I can only give to you such facts as any man may gain without any assistance from me."

The rest of this article will have to do with a method of road building which, in my judgment, will, when absolutely and finally perfected, meet every requirement for street or road service, from that of a street of heaviest traffic to a country road.

The limitation of this process will be climate. Where the line will be drawn, no one can yet say. The process involves the mixture of a mineral oil, carrying a high percentage of asphalt, with the natural soil of the road surface, and the tamping of this intimate mixture by an apparatus known as a tamping roller which has projecting prongs, each one of which, as the roller is drawn over the road surface, in its turn enters the loose soil and tamps it down, as the feet of sheep tamp the ground whenever a flock of sheep passes over it. The surface of this road will be made in cases of the natural soil of the region. In other instances, it will be a layer of extraneous material.

Slauson Avenue, Southern Boundary of Los Angeles.

Road made by petrolithic process on natural sandy soil, suggests the solution of the Florida problem, where similar conditions exist.

The origin of this method was in Kern county in this State. I learned of it in 1902, when I was preparing my paper afterwards published by the United States Department of Agriculture under the title "The Use of Mineral Oil in Road Improvement." I did not get a chance to see one of the rollers, and of course I did not witness its operation; and hesitating to write of what I had not seen, I did not mention it in my paper.

The eminent civil engineer, H. P. Gillette, whose works on several engineering subjects have become classic reference books for the profession, himself an enthusiastic road expert and road authority, saw the importance of this before I recognized it; and he induced his father, T. W. Gillette, to look into it. T. W. Gillette was my old co-worker in the Northwest. Years ago, when chairman of the Board of County Commissioners of Whatcom County, Washington, he led the movement for highway betterment in that county which resulted in making Whatcom county, Washington, at one time the most famous county for its roads in the United States.

It required courage in those days to use the people's money to construct roads through the bog holes and swamps of that section, where the roads had been so soft that they would mire a saddle blanket, and where it had been supposed that nothing but a plank road would float upon the waves of mud. But Mr. Gillette is a man of great tenacity of purpose as well as foresight. He was quicker than his associates to see what Whatcom county must have, and almost at the risk of his life he forced them to join him in that enlightened policy, which later made Whatcom county so illustrious.

Mr. Gillette, then and now president of the Fairhaven Water Company, spending part of his time in Whatcom county, Washington, and the rest at his beautiful home in Pasadena, induced to join him a number of gentlemen of wealth

Orange Grove Avenue, One of Los Angeles' Beauty Streets.

Street in Monrovia, Cal., Improved by Petrolithic Process.

and large view who were satisfied to accept the judgment of himself and his eminent son. They organized what they called the Petrolithic Pavement Company, the name being derived from two words meaning petroleum and rock.

With unfailing patience and unswerving purpose, they have worked at this problem. There was a vast deal to learn. Little was known definitely about mineral oil. While some oils were valuable, other oils were nearly worthless. Little was known about how substitutes for natural asphalt oil could be obtained. Little was known about the effect of oil in road-making, outside of California. Up to date, these men, engaged upon a work of universal beneficence, have found the balance large on the wrong side of the ledger. It will not always be so. If my study of road building in every possible phase for nearly forty years has been sufficient to justify me in forming a reliable conclusion, this petrolithic pavement road, when finally perfected, is to be the most satisfactory roadway for mankind.

That epigram of the ancient Romans, "Ad astra per aspera," receives a new confirmation in the experience of every great, successful enterprise. This is the lesson these gentlemen have been learning from contractors of differing grades of honesty and intelligence, the puzzling vagaries of nature in producing oil, the physical laws of road material, and the varying climates of widely separated localities. There is much yet to be learned. There is much known to-day which was not known a year ago. There is much yet to be done before the inertia of ignorance and habit among men has been finally overcome.

In California the battle has been practically won. That Pasadena boulevard which a year ago was an abysmal morass, is to-day, as I have said, the best road I have ever seen; and it is the best because it is a petrolithic road. The most interesting feature of it perhaps is that it did not cost more than a quarter of what a stone covered road would cost.

In a bend of that road, where the flying squadron of automobiles from Los Angeles meets the flying squadron coming from Pasadena, and where each is obscured from the sight of the other by an intervening slope, there was recently a sign which bore the legend, "Please slow down here to seventy miles an hour." A few days ago I went out with my camera to preserve that realistic feature of the landscape, but I found myself too late. It was gone, and I was awfully disappointed. It is true that automobiles do fly over this road at seventy miles an hour, but it is fair to assume that they generally get down to at least thirty when rounding this curve. In the interest of a common humanity, let us hope so.

The autoists tell me that nowhere else in their experience have they ever ridden over a road so satisfactory to them or their patrons. Neither warts nor smallpox have developed upon the surface of this road, but the automobile glides along with a motion suggestive of the Twentieth Century Limited, as smoothly almost as if on a velvet carpet.

Three years ago the town of Monrovia, a few miles east of Los Angeles, began constructing a system of petrolithic streets upon the natural soil which is a disintegrated granite. Those streets are to-day one of the features of interest to the tourist in Southern California. They have had no repairs during the time and they exhibit no signs of wear.

Los Angeles is bordered on the south by Slauson avenue. The natural soil is sand, and on a portion of Slauson avenue has been constructed a petrolithic road. It is ideal, and no road

A Typical Bit of Pasadena, Cal.—In the Foreground Are the Homes of Two Directors of the Petrolithic Movement.

builder could see it without exclaiming, "Here is the solution of the Florida problem." Any road builder who knows the character of the sand which overlies most of Florida and who understands the action of asphalt with sand and carbonate of lime, which is more or less abundant in Florida, knows that the sand of Florida would yield better results under the petrolithic process than Slauson avenue has yielded.

West Adams street, in Los Angeles, the most magnificent residence street in that magnificent city, has recently been paved by the petrolithic process, the specifications having been gotten up by Homer Hamlin, the city engineer of that city, and one of the most competent city engineers in the United States. If there is a Barber asphalt pavement in the country which will touch West Adams street in as many of the essentials of a perfect pavement, it has never yet been my privilege to see it, nor have I ever yet seen a Barber asphalt pavement constructed at a cost of 35 cents per square yard, which I am told is more than it cost to pave West Adams street.

Pasadena is *facile princeps* the most beautiful residence city in the world. Here the art of man has taken the handiwork of God and out of it fashioned the most exquisite collection of æsthetic products ever grouped within the boundaries of a single city. What West Adams street is to Los Angeles is Orange Grove avenue to Pasadena, sixty feet wide between

A Tamping Roller Showing the Feet of the Iron Sheep.

curbs, on either side for miles in unbroken succession bower after bower of bewildering beauty.

Before the automobile came, with its wearing effect upon road surfaces, Orange Grove avenue was paved with granite, after the old Macadam method. Its preeminent function has always been to feed and clothe the watering-cart man and his family. At certain hours each day the automobiles which sweep along that avenue have distributed impartially upon the just and the unjust a shower of mud. During all the other hours of each pleasant day this street material in varying degrees of desiccation is whirled up in clouds, which the wind, blowing where it listeth, generally lists to drive into the faces of all the people who pass up and down the avenue.

The emancipation of Orange Grove avenue awaits the petrolithic process. It will be a hard blow to the watering-cart man, but I think there will be much compensation in the absolute freedom thereafter from the showers of mud and the whirlwinds of sand which have hitherto been such a destructive plague upon fine raiment and the countenances of human beings.

If the Los Angeles County Highway Commission does not make a comprehensive use of the petrolithic process in the roads they are going to construct, I shall be very sorry for them after they have experienced the effect of public sentiment.

The Petrolithic Pavement Company has thus far made no attempt to do anything in the East. When they get ready to invade New Jersey there will be something doing, as your readers who ride in motor cars will discover. Although their operations have been confined largely to California cities, of which nearly forty have already had the benefit of this process, so insistent has been the demand from outside points that almost in spite of themselves the breastworks have been advanced to Louisiana, Florida, Cuba and even to Rio de Janeiro, Brazil, and I do not hesitate to predict that in the not distant future he who attempts to follow the petrolithic flag will find that, like the flag of Great Britain, it will lead him around the world.

I beg to say in this connection that I have not a cent's worth of interest in the petrolithic pavement, and never expect to have; that my interest in the cause of good roads solely has led me to take this interest in what I conceive to be the most important event in road construction since the days of Macadam; and I beg to say that it has been only at considerable financial loss that I have done it. Like all my other experience in road work, it has been at serious personal sacrifice.

This may be the last article I shall ever write on the road subject. It is my present determination that that shall be the case. But I am very glad that it has been permitted to me to make my final message, as I believe, so important to mankind

ROAD EXPERIMENTATION IN MASSACHUSETTS.

Boston, July 1.—To the Commonwealth of Massachusetts with its more than 700 miles of improved State highway and its nearly 14,000 registered automobiles, to say nothing of thousands of visiting machines constantly using the roads, the problem of maintenance and preservation has assumed a serious aspect and the Highway Commission is casting about for some effective means of preventing the rapid deterioration of the fine stone highways which stretch from one end of the State to the other.

The problem of road maintenance in Massachusetts is complicated by the numerous and varied conditions that are encountered, ranging all the way from the steep grades of the Berkshires to the sand of Cape Cod.

The most interesting experiment that has yet been undertaken is that which is just about to be started by the commission and the town of Hamilton. This is the construction of a dustless highway, the contracts for which have already been let. It is proposed to tear up a strip of much traveled road and to build it over from the bottom course to the top. The bottom course will be laid as in the ordinary macadam road of stone crushed to the proper size. This will be rolled hard. There will then be applied a course two inches thick of stone which has previously been treated with tar. This will be spread on and rolled solid. Upon the top will be placed a thin layer of tar. The top layer is considered the most important of all, for it is not desired to build a tar concrete but rather a stone road with sufficient tar to bind it and give a smooth surface.

Another interesting piece of work is about to be started on Cape Cod between Chatham and New Orleans, where there is no stone to speak of and where the road must be built entirely from sand. Here a Texas asphalt oil is to be used. The sand road will first be shaped with a road machine. Over the surface the oil will be spread hot. After the first coat has been on two weeks the second coat will be applied. Then the surface will be cut up with a disc harrow so as to mix the sand and oil to a depth of four inches. Then the road will be rolled and thin sprinkling of sand put on to take up the surface oil. The commission did a little work of this kind two years ago and it proved so satisfactory that it has been adopted for use on the Cape, where there is not material for stone roads. On the piece originally built in this way the results have been excellent, a good, firm road resulting, which has stood up under the wear better than was anticipated.

A third new method that is being tried is the application of thin coal tar. In the town of Marlboro two contracts have been let to parties making proprietary coal tar preparations. One applies the tar cold and the other applies it hot. The stone road is first swept, then the thin tar is applied and brushed in, after which the sweepings are put back to form a surface.

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REMOVAL NOTICE.

The Class Journal Company, publishers of "The Automobile," "The Automobile Blue Book," "The Automobile Trade Directory," etc., has removed its publication offices to the Thirty-ninth street building, Nos. 231-241 West Thirty-ninth street, New York City, from the Flatiron building, where the offices have been located for the past five years.

The rapid increase in the company's general business has made it necessary to enlarge its facilities, and the entire sixth floor of the new building is devoted to its present requirements.

A cordial invitation to our patrons is extended to visit our new offices, where every courtesy will be extended.

New York patrons are requested to make special note of the new telephone number, 2046-Bryant. It is not listed correctly in the New York telephone directory.

THE CLASS JOURNAL COMPANY,
231-241 West Thirty-ninth street,
New York.

AUTO ENGINEERS A GROWING BODY.

Nothing has served to show more strikingly the widespread interest in the movement for the fostering of independent engineering investigation in the automobile field than the success which attended the holding of the third annual summer meeting of the Society of Automobile Engineers at Detroit during the latter half of last week. Although this infant engineering organization can already claim an age of three years, which though little in other fields of endeavor, is a considerable lapse of time when measured by the rapidity of progress in the automobile field, it has suffered during the greater part of its existence from having had its light hidden under a bushel. The fact that there was such an organization in the industry only needed to be known to attract to its support the majority of the leading engineers and designers, and immediately the fact was made known that the Society also welcomed to its ranks the technical men of the accessory and allied interests the increase in its membership has been very rapid.

The possibilities for good that are bound up in such an organization, both to the industry as a whole and to the individual engineers themselves, need hardly be dwelt upon. As evidence of what can be done by proper methods and a wise administration, the dean of engineering bodies in this country, the American Society of Mechanical Engineers, need only be cited. Although it has required many years for the latter organization to arrive at its present position of influence and authority in the mechanical field, the future that lies before the Society of Automobile Engineers is not less bright and its development is bound to be many times as rapid, not alone owing to the great rapidity with which things progress in the automobile industry, but also owing to the fact that conditions generally are vastly different.

With a view to insuring the greatest attendance with the least inconvenience and of procuring all possible facilities right at hand for the furtherance of its investigations, it is the policy of the Society to hold its meetings in automobile manufacturing centers, barring the annual meeting, which, under its constitution, must be held in New York, and there is every prospect that the third quarterly meeting for 1908, to be held in Cleveland, will be fully as successful as its predecessor.

* * *

STUDYING THE TRANSMISSION PROBLEM.

For the present, at least, it may be conceded that the matter of motor design and construction has been brought to a fairly well established point of standard practice. True, there are numerous standards, but barring revolutionary discoveries, improvement will follow the lines of detailed refinement rather than radical departures from types now current. This being the case, the problem of working out the most efficient method of transmitting the power from the motor to the rear wheels appears to be the most important item of design that now confronts the automobile engineer. Naturally, many consider that this has already been solved, and to a certain extent this is the case. The tendency in recent years has been toward the adoption of what has been aptly termed the "transmission axle" on one hand, while on the other the motor and gear-set are one.

A moment's consideration suffices to show that both types embody numerous advantages and that in many instances those of one are lacking in the other. Herein lies the difficulty, for it is a matter of common knowledge that it has thus far been found practically impossible to reconcile designers on such points as the dimensions of main bearings, even where their standards differed from the other fellows' by sixteenths, or sometimes even sixty-fourths of an inch. The transmission axle permits of the use of a single universal and a long driving shaft, but it brings considerable unsprung weight on the rear tires, and the advantages of the motor and transmission unit type are likewise counteracted by disadvantages, so that the problem calls for much study.

NATIONAL COMMITTEE OF THE AMERICAN AUTOMOBILE ASSOCIATION

IN CHARGE OF THE

GOOD ROADS AND LEGISLATIVE CONVENTION

TO BE HELD AT BUFFALO, NEW YORK

JULY 7-8, 1908

CO-OPERATING NATIONAL ORGANIZATIONS: NATIONAL GRANGE AND AMERICAN ROAD MAKERS ASSOCIATION

Hon. Charles Thaddeus Terry, New York.
Charman, Legislative Board, American Automobile Association.

Frank B. Hower, Buffalo.
Chairman, Touring Board, American Automobile Association. President Automobile Club of Buffalo.

Robert P. Hooper, Philadelphia.
Chairman, Good Roads Board, American Automobile Association.

Hon. James H. MacDonald, Hartford.
President American Road Makers Association.

Ex-Governor N. J. Bachelder, Concord, N. H.
Master of National Grange.

W. H. Hotchkiss, Buffalo.
President American Automobile Association.

Alfred Reeves, New York.
Representing the American Motor Car Manufacturers Association.

S. D. Waldon, Detroit.
Representing the National Association of Automobile Manufacturers.

F. H. Elliott, New York.
Secretary, American Automobile Association.

"GOOD ROADS AND UNIFORM LEGISLATION"—THE CRY

EVERYTHING points to a momentous gathering of automobilists and highway improvement apostles at Buffalo July 6, 7 and 8, on the occasion of the American Automobile Association's Good Roads and Legislative Convention. Not only clubs, but State divisions are organizing tours. Each day brings advices of additional delegates appointed by Governors of States, highway boards and clubs.

"Good Roads and Uniform Legislation" is to be the slogan. The battle cry quoted will be seen in red and white lettering on thousands of blue pennants made for the occasion, with the emblem of the American Automobile Association in the center.

The committee is now finding it difficult to keep the program down to proportions practicable for the time allotted, as the list of speakers and demonstrators has been steadily increasing.

Additional delegates from Western States appointed by the State executives are: By Governor John C. Cutler, of Utah, Hon. D. R. Roberts; by Governor Henry A. Buchtel, of Colorado, Dr. F. L. Bartlett, E. A. Coleburn, G. H. Fernald, George E. Hannan, J. Harvey Nichols, Jr., A. T. Wilson, W. S. Hunnewell, E. L. Mathewson and D. M. Howell.

In addition to the delegates from sixteen other States, various clubs have so far notified the committee that they will be represented as follows:

Automobile Club of Hartford, Conn., Walter S. Schutz.

Automobile Club of Southern California, Los Angeles, Charlee B. Hopper.

New Jersey Automobile and Motor Club, Newark, Paul E. Heller, J. H. Wood, chairman good roads committee, and F. A. Crosselmire.

Automobile Club of Springfield, Springfield, Mass., Mark Aitken. A. E. Lerche, M. T. White and S. L. Haynes.

Elyria Automobile Club, Elyria, Ohio, A. L. Stark, W. N. Gatee and A. L. Garford.

Automobile Club of St. Louis, Mo., Roy F. Britton and Sam D. Capen.

Automobile Club of Wilkensburg, Wilkensburg, Pa., Dr. W. R. Stephens, A. J. Puffinburg and Dr. W. C. Cook.

Automobile Club of Philadelphia, Powell Evans, W. O. Griffith and S. Boyer Davis.

Quaker City Motor Club, Philadelphia, A. T. James, Edwin A. Lewis, Dr. W. J. Donnally and L. E. French.

Chicago Automobile Club, T. J. Hyman, Claude Seymour and A. R. Stumer.

Automobile Club of Bridgeport, Bridgeport, Conn., S. T. Davis, Jr., and A. L. Riker.

Wilkes-Barre Automobile Club, Wilkes-Barre, Pa., Dr. E. C. Wagner and W. L. Raeder.

Malden Automobile Club, Malden, Mass., A. E. Bliss, A. B. Tenney and C. P. Price.

Automobile Club of Washington, Washington, D. C., Robert B. Caverly, John K. Heyl and William D. West.

Norristown Automobile Club, Norristown, Pa., Edwin S. Nyce, Fred M. Jacquith and John E. Mountain.

Automobile Club of Pittsburg, Edward Kneeland, John C. Bragdon, Paul C. Wolff, Edward J. Kent, M. F. Leslie and S. A. Stewart.

Automobile Club of Germantown, Germantown, Pa., Mark Reeves, Charles H. Thompson and C. H. Wheeler.

Cleveland Automobile Club, W. C. Baker, H. L. Vail and W. P. Murray.

Automobile Club of Franklin, Franklin, Pa., John A. Wilcon, Charles Gearing and C. E. Trace.

Automobile Club of Vermont, Springfield, Vt., Charlee C. Warren, James M. Boutwell, W. D. Woolson and W. W. Brown.

Brockton Automobile Club, Brockton, Mass., Henry R. Burbeck.

Rocheeter Automobile Club, H. C. Strong, W. C. Barry, Jr., F. E. Mason, John W. Breyfogle, W. H. Campbell and Bert Van Tuyle.

Long Island Automobile Club, Frank G. Webb, Alfred Wilmarth and Russell A. Field.

Automobile Club of Kansas City, Kansas City, Mo., George M. Hawes and L. R. Moore, Jr.

Mt. Vernon Automobile Club, Mt. Vernon, N. Y., William Adams, Franklin A. Merriam and Mark D. Stiles.

Cities, towns and villages will be officially represented by appointed delegations, and the good roads flag will fly from every automobile, every hotel and hundreds of buildings in the Bison City, while the streets will swarm with men wearing the emblem of the A. A. A. convention.

It can safely be prophesied that the convention will mark the beginning of a historic epoch in the fight for uniform legislation and the battle for improved highways in this country.

HARD STRUGGLES AHEAD FOR A. A. A. TOUR TROPHIES.

ONE week from to-day the fifth annual reliability run of the Automobile Association will start from Buffalo. Indications point to a list of participants very close to that of last year, despite the doubling of the entry fee and that the contest for the Glidden and Hower trophies will be fought more fiercely than ever before. This is especially true of the Glidden contest, in view of the fact that the club teams this year will be almost universally made up of trios of individual makers, thus adding more destructive trade rivalry to the struggle.

Entries will close to-morrow with Chairman Frank B. Hower, at Buffalo. In past years the bulk of the nominations came with the closing day's mails. Mr. Hower says that from the assurances of entries he has had from makers, many of which have not yet materialized, he is confident that history will repeat itself this year. The entries given out by the touring board chairman up to the close of last week are nearly up to the number received at the corresponding date last year.

Recent nominations for the Glidden trophy embrace J. F. Duryea, Stevens-Duryea; I. H. Page, Stevens-Duryea; C. H. Foster, unnamed; Frank H. Nutt, Haynes, and Loring Wagoner, Haynes.

The following officials will assist Chairman Hower in the conduct of the tour: Dai H. Lewis, secretary of the A. A. A. Touring Board, in charge of the confetti and pilot car; E. L. Ferguson, starter; Mortimer Reeves, checker at the finish, and in charge of night controls; F. D. Stidham, chief of observers; H. D. Herr, hotel arrangements; David E. Hoag, M.D., official surgeon; Arthur Jervis, press representative; W. L. Conklin and W. A. Carroll, watchers.

Charles J. Glidden, the donor of the trophy bearing his name, will, as usual, be on the tour. Mr. Glidden will be the guest of Mr. Hower, and will ride in his car, starting every morning half an hour before the first contestant and setting an even pace. No contesting car will be allowed to pass the chairman's car.

MANAGER MILES IS HOMEWARD BOUND.

S. A. Miles, general manager of the N. A. A. M., is expected to return from his European tour between the 8th and 10th, in time to attend the preliminary meeting on the allotment of spaces for the Chicago Show, which will be held at the headquarters of the National Association, New York City.

NEW YORK TRADESMEN TO PROMOTE RACES.

It is reported that some New York tradesmen are to form an organization for the promotion of races on various tracks in the metropolitan district. It is believed that the Briarcliff committee, made up of the entrants in the last contest, will be the nucleus of the new race-promoting body.

HOTCHKISS APPOINTS COMMITTEE ON FOREIGN AFFAIRS

THE most important development of the week in the A. A. A. racing situation is the announcement that President Hotchkiss bas appointed a special committee, the members of which are now in Europe, and practically all of whom will witness the Grand Prix race at Dieppe, France, on July 7. The aim of this committee will be to clearly define the position of the American Automobile Association through a properly accredited delegate, who will appear before the International Association of Recognized Automobile Clubs at the coming Ostend meeting.

The following official statement from A. A. A. headquarters, which is appended, is self-explanatory, and fully covers the phases of the question involved:

To the end that governing bodies abroad may be accurately informed as to American conditions and concerning the standing of the American Automobile Association as the national governing body both in racing and as the central organization for the dissemination of touring information, tbe procurement of proper motor legislation and the promotion of the present movement for good roads, President Hotchkiss of the American Automobile Association has appointed a special Committee on Foreign Affairs, composed of William K. Vanderbilt, Jr., Jefferson DeMont Thompson, A. G. Batcheider, S. A. Miles and Robert Graves. All of these gentlemen will be in Europe this summer and most of them will attend the Grand Prix race at Dieppe on July 7. Indeed, it may be possible that after conference in Paris this committee will be represented at Ostend and then officially bring before what is known as the International Association of Recognized Automobile Clubs the exact facts as to our American conditions. Recent advices from Europe clearly indicate that the leading motorists abroad are not acquainted with these facts and thus have been easily misled by interested agents on the ground.

The committee above named has been given large powers, and, it is believed, will make it clear abroad that there is and can be but one national body in the United States; that no single club can be such national body; and that the national body is tbe American Automobile Association with its twenty-four State associations, ite 200 clubs, and its regietered membership of 20,000.

June 30, 1908. FREDERICK H. ELLIOTT, Secretary,
American Automobile Association.

CHICAGO WON'T BE TAIL TO THE NEW YORK KITE

THE Automobile Club of America's little scheme for a chain of allied clubs to help make good its bluff as a national organization and thus give some color to its pretenses to the the control of racing in this country, bas received something of a setback in the Western metropolis. The Chicago Automobile Club did not fancy a little bit being made a mere loop in the tail of the New York Club's kite and said so most pointedly in the following resolution, which was unanimously adopted by its board of governors:

"Resolved, That the Chicago Automobile Club respectfully declines the invitation of the Automobile Club of America to withdraw from the Illinois State Automobile Association and thereby from the American Automobile Association, and to join with the Automobile Club of America in an effort to control American motor racing."

Winthrop E. Scarritt, former president of the New York club, and a quondam occupant of the A. A. A. presidential chair, an orator of no mean repute in automobile circles, a proverbially persuasive talker, went to Chicago recently and with approved credentials laid before the Chicago Automobile Club a plan to unite with it in an effort to assume the control of racing in this country, as shown by the coming effort at Savannah.

The civic pride of the Chicagoans was a bit touched at the idea of practically acknowledging the New York Club as a leader. The chance to communicate with the European bodies through the New York club's foreign connections did not somehow appeal to them either; hence the foregoing resolutions.

Secretary Sidney S. Gorham, of the Chicago Automobile Club, put the opinion of his fellows in a nutshell when he said: "We declined the invitation of the Automobile Club of America because we felt the interests of motoring would be best served by remaining loyal to the A. A. A. The latter is an independent body for national control of the sport. Just because the Automobile Club of America saw fit to break away from the New York State Automobile Association, and, therefore, the A. A. A., is no reason why the Chicago Club should do so."

The Chicago club, as might be expected, did not see the Americanism, common sense, or logic of the sport in this country being controlled by several, much less one or two clubs, as opposed to government by a national organization of autoists.

It may be interesting and pertinent to note in this connection that advices received from the directors of the American Automobile Association, in practically all of the large cities of the country, including Philadelphia, Baltimore, Boston, St. Louis, Cincinnati, Cleveland, Detroit, Milwaukee, Minneapolis, St. Paul, Pittsburg, Buffalo and Kansas City, indicate that their clubs are loyally supporting the American Automobile Association and are opposed to any movement like that suggested to the Chicago Automobile Club by the New York organization.

Incidentally, it may be stated, with due authorization that the report that recently found some publicity that an alliance between the New York and Chicago clubs had been consummated was incorrect, the two clubs having merely agreed to grant one another's members reciprocal clubhouse privileges.

TO CONVERT PALACE INTO FAIRYLAND.

A complete surprise is promised in the decorations of Grand Central Palace for the A. M. C. M. A. international show, December 31 to January 7, for which Parisian and American artists are now engaged in making the designs.

"It is a safe bet that the Palace will take on a far more beautiful appearance than ever before," says H. O. Smith, chairman of the show committee. "Decorating schemes have already been submitted and others are in process of perfection that will turn the Palace into a veritable Fairyland. It is our intention to have the Palace show eclipse anything of its nature ever held before. Everything that money and artistic effects can do will be embodied in the next show. We are giving all artists, designers and decorators a free rein, and I expect that this competition will give us the best there is in them."

THOMAS AGAIN LEADS RACE TO PARIS.

Despite the lead of two or three days that the Protos had gained over the Thomas, due to the accident the latter sustained in bumping over unballasted ties, the Americans have again overtaken their German competitors at Omsk, Siberia, according to advices received by the New York *Times*. But the Protos was caught up with only after a most discouraging struggle, in which everything was sacrificed to make time, the Thomas being driven 19 or 20 hours out of every 24, Miller relieving Schuster at the wheel. On arriving at Omsk, it was learned that the Germans had broken down 30 miles east of Kainsk, 208 miles to the rear. Omsk is 3,408 miles from Vladivostok and 5,872 miles from Paris, and, by arriving there June 29, Schuster has made the run in four days less time than Borghese did in the Itala in the Pekin-Paris last year.

FRANCE ALL AGOG AWAITING THE GRAND PRIX

DIEPPE, June 22.—Dieppe, eighteen days from the race which will attract the attention of the whole world, is a dull city. The triangular set of roads beginning up on the high chalk cliffs just on the edge of the town has been closed to all racing cars and is being jealously watched by gendarmes in order that fast touring cars shall not develop all the power that is in them. According to the official notice sent out by the club and the local authorities all automobiles must travel over this course, capable of speeds of 100 miles an hour, at a rate of travel not exceeding 12 miles in the 60 minutes.

As European drivers would have difficulty in throttling down their speed monsters to such an extent, they have abandoned the course to the army of workmen who, under the direction of the Dieppe municipality, are endeavoring to put the triangular course into a condition satisfactory to the critical Racing Board of the Automobile Club of France. When the club officials came up last week for their formal examination of the course, they were disappointed—perhaps it would be more correct to say they were vexed—and bluntly told the authorities, who had undertaken to remake the roads, that they were not at all up to the standard. If fine weather continues during the next eighteen days the Dieppe course may be a perfect tarred ribbon of road for a distance of 77 kilometers; if rain falls there will be spots strewn with loose stones and patches which cannot be considered good for speeds of over 70 miles an hour.

Though the Dieppe course has been deserted by every European contestant, America remains on the ground. Every morning around 9 o'clock a big red Thomas flyer slips out of the Grand Hotel garage, picks a way along the fish-strewn pier and crosses over the two wooden bridges spanning the docks. Dieppe is still too nautical to be automobile, and her population is as ignorant of the ways of the benzine buggy as the natives of any fishing

PRINCIPAL FEATURES OF THE RACING CARS ENTERED FOR THE FRENCH GRAND PRIX, JULY 7.

CAR	Drivers	Engine	Stroke	H.P.	Carhureter	Gooling	Ignition	Clutch	Transmission	Drive	Wheels	Track	Wheelbase
AUSTIN (England)...	Moore Brahazon. Resta..... Wright.....	6 cylinders, cast in pairs.	4.9	120	Parallel currents.	Centf'l pump, Austin radiator.	H.T. magneto	Leather cone.	Sel. slid'g gear, 4 speeds.	Shaft...	87SX105 880X120	52 ins.	107 ins.
BENZ (Germany)....	Hemery..... Hanriot..... Erbe.....	4 cylinders, in p'rs, dome heads, valves at 45°	6.4	110	Perpend. currents.	Centf'l pump, honeycomh radiator.	H.T. Bosch magneto.	Leather cone.	Sel. slid'g gear, 4 speeds.	Side chains.	880X120 880X120	52 ins.	108 ins.
BRASIER (France)...	Thery..... Baras..... Bahlot.....	4 cylinders, in pairs.	6.6	120	Converg. currents.	Centf'l pump, tuhular radiator.	L.T. Bosch magneto.	Leather cone.	Sel. slid'g gear, 3 speeds.	Side chains.	870X90 880X120	52 ins.	107 ins.
BAYARD-CLEMENT (France).....	Rigal..... Gabriel..... Hautvast.....	4 cylinders, in p'rs, dome heads, sin. overh'd camshaft	7.2	120	Bayard-Clement.	Centf'l pump, honeycomh radiator.	H. T. Bosch magneto.	Metallic disc.	Sel. slid'g gear, 4 speeds.	Shaft.	870X90 880X120	50 ins.	105 ins.
FIAT (Italy).....	Lancia..... Nazzaro..... Wagner.....	4 cylind'rs, in p'rs, dome heads, single chamshaft.	6.8	123	Perpendic. currents.	Centf'l pump, honeycomh radiator.	L. T. Bosch magneto.	Metallic disc.	Sel. slid'g gear, 4 speeds.	Side chains.	870X105 880X120	50 ins.	107 ins.
GERMAIN (Belgium)	Degrais..... Roch-Brault..... Perpere.....	4 sep. steel cylinders. copper jackets, valves opposite sides.	6.6	120	Single nozzle, without ad'nal air.	Centf'l pump, honeycomh radiator.	H. T. Bosch magneto.	Expand. metallic	Sel. slid'g gear, 3 speeds.	Side chains.	870X90 880X120	52 ins.	119 ins.
ITALA (Italy).....	Cagno..... Fournier..... Placenza	4 cylinders, in pairs, dome heads.	6.2	115	Perpend. currents.	Centf'l pump, honeycomh radiator.	L. T. Bosch magneto.	Metallic disc.	Sel. slid'g gear, 4 speeds.	Shaft.	87SX105 895X135	54 ins.	118 ins.
LORRAINE-DIETRICH (France).....	Duray..... Rougier..... Minoia.....	4 cylinders, in pairs.	6.8	123	Perpend. currents.	Centf'l pump,	L. T. Bosch magneto.	Metallic disc.	Sel. slid'g gear, 4 speeds.	Side chains.	870X105 880X120	52 ins.	107 ins.
MERCEDES (Germany).....	Salzer..... Poegge..... Lauttenschlager.	4 cylinders, in pairs, dome heads.	6.6	120	Perpend. currents.	Centf'l pump, honeycomh radiator.	H. T. Bosch magneto.	Lindsay spiral spring.	Sel. slid'g gear, 4 speeds.	Side chains.	870X90 880X120	52 ins.	105 ins.
MOTOBLOC (France)	Courtade ..... Pierron ..... Garcet	4 cylinders, in p'rs, flywheel in centre dome h'ds, overhead valves with single camshaft.	6.6	120	Perpend. currents.	Centf'l pump, honeycomh radiator.	H. T. Nilmelor magneto.	Metallic disc.	Sel. slid'g gear, 4 speeds.	Side chains.	870X90 880X120	50 ins.	103 ins.
OPEL (Germany)....	Opel..... Joerns..... Michel.....	4 cylinders in pairs.	6.2	115	Converg'nt currents.	Centf'l pump, honeycomb radiator.	H. T. Bosch magneto.	Leather cone.	Sel. slid'g gear, 4 speeds.	Side chains.	87SX105 880X120	52 ins.	103 ins.
PANHARD-LEVASSOR (France).....	Heath..... Maurice Farman. Cissac.....	4 sep. steel cylinders, copp'r jackets, valves opposite sides.	6.6	120	Automatic hydraulic regulator.	Centf'l pump, honeycomh radiator.	H. T. Nilmelior magneto.	Metallic disc.	Selective sliding gear, 4 speeds.	Side chains.	870X90 880X120	50 ins.	103 ins.
PORTHOS (France)..	Stricker..... Gauhert..... Simon	6 cylinders, separate	4.7	98	Automatic Porthos	Centf'l pump, honeycomh radiator.	H. T. Bosch magneto.	Leather cone.	Sel. slid'g gear, 3 speeds.	Shaft.	87SX105 857X105	52 ins.	123 ins.
RENAULT (France)..	Szisz..... Caillois..... Dimitriewitch...	4 cylinders, in pairs, valves one side.	6.2	115	Perpend. currents.	Copper tube radiator on dash; thermo-syphon.	H. T. Bosch magneto.	Leather cone.	Progr's've sliding gear, 3 speeds.	Shaft...	875X90 875X120	50 ins.	105 ins.
THOMAS FLYER (America).....	Strang.....	4 cylinders, separate; valves opposite sides.	5.7	80	Perpend. currents.	Gear-driven pump, cellular radiator.	H.T.Eiseman magneto; Atwater K't generator.	Metallic disc.	Sel. slid'g gear, 4 speeds.	Side chains.	87SX105 880X120	56 ins.	112 ins.
WEIGEL (England)..	Laxen..... Harrison ..... Coleman.....	4 cylinders, one cast'g, d'me h'ds, valves at 45°.	6.6	120	Parallel currents.	Centf'l pump, honeycomh radiator.	H. T. Bosch magneto; stor. bat'ries	Leather cone.	Sel. slid'g gear, 3 speeds.	Shaft.	880X120 880X120	56 ins.	111 ins.
MORS (France).....	Jenatzy..... Jarrott	4 cylinders, separate overhead valves.	6.6	120	Automatic	Tahular radiator gear driven pump.	L. T. Mors magneto.	Leather cone.	Progr's've sliding gear. 3 speeds.	Side chains.	815X105 895X135	49 ins.	102 ins.

hamlet in wild Brittany. Generally, when the big red Thomas—or any other car, for that matter—emits its first honk at the beginning of the narrow bridge, half a dozen tugs of war immediately commence between as many pairs of mariners engaged in transporting a heavy basket of fish. Sometimes it is a baby carriage containing one speck of humanity and some of the products of the briny that obstructs the way when the first honk goes forth. Then it is a struggle between the half dozen relatives as to which side of the road shall be closed. The men will pull to starboard, the women will pull to port, while the baby threatens to fall overboard. A loud roar of laughter from Strang at the wheel of the immobilized Thomas, and the struggling group, realizing that there is nothing to fear from the big auto, stop to respond with a smile at their own foolishness and fear. The baby is saved, but the next time it meets an auto on the bridge it will be the center of the same scared group.

As there will be no possible chance of the American racing car going on the course until the moment it is given the order to start in chase of the fourteen ahead of it on July 7, Strang has made a practice of going around the course on a touring car from three to four times a day. Certainly the 1908 Grand Prix will be the most keenly contested automobile race the world has ever seen; the cars have been prepared with a greater care than ever before, and the drivers are more highly trained. For this reason alone it is essential to know the course so thoroughly that there will never be a moment when the nature of the stretch ahead cannot be recalled. There is some caution needed in this daily training, for, although there are few cars, there are numerous tar wagons and a few keen-eyed gendarmes at Criel.

Because it is the only car on the road the Thomas Flyer has been frequently called upon to act the rôle of the good Samaritan. One afternoon it was a long-robed priest with his clerical garments pinned around his legs, who was carried back to the garage from an outlying spot on the course, where his motorcycle had suddenly decided to go out of business. Half an hour's patching by the team of mechanics at the garage and the clerical gentleman had scrambled on his saddle and was tuf-tuffing down the road, after struggling to return thanks in broken English. Next afternoon is would be the village postman, who, for the first time in his life, had a practical experience of how nine kilometers could be covered in nine minutes. On the next round the gendarme himself would plead to be taken home faster than his legs could carry him, or the dignified government gamekeeper would make a sign that he would like to be helped along. None of them were refused.

Although there are no racing teams on the course, practically every firm has secured headquarters either in Dieppe or in the little towns and villages of the neighborhood. Now and again an entire team will run up from Paris on a practice trip, stay a few hours and disappear with a formidable roar. Gabriel, Rigal and Hautvast, who made one of these appearances this week on their Bayard-Clement cars, claim that they have covered the kilometer in 21 seconds, which is equal to the tremendous average of 106 miles an hour. Duray, of the Dietrich team, whose trial trips have been of no less than 500 miles a day, claims about the same period. Szisz, chief of the Renault team, puts in lower claims for speed, but is none the less confident of winning, the three cars being marvels of regularity. Benz, Fiat and Itala are known by the French to be dangerous rivals who might again rob the tricolor of victory.

There is very little doubt but that the speed average of 70.6 miles an hour established last year will be broken next month, providing, of course, that weather conditions are favorable. It will be a remarkable performance to thus break the record, for, under the 155-millimeter rule, the cars have on an average been reduced in bore by one inch. Naturally, under such rules, the stroke exceeds the bore, all the engines, with the exception of the British Weigel and the American, being long-stroke, slow-speed engines. In the voiturette race to be held the previous day, exaggerated strokes are well in evidence, some of the little single cylinder cars, with a bore of slightly less than 4 inches, having a stroke of 7 1-2 inches and an engine speed of 2,200 revolutions a minute. Horsepower is rated anywhere from 14 to 22, and maximum speed is estimated at 55 or 56 miles an hour.

THREE UNBROKEN IN ALBANY RUN.

ALBANY, June 26.—Three of the seven contestants in the six-day endurance run of the Albany Automobile Club, which ended here to-night, completed the test with perfect scores. They were Joseph Taylor, Locomobile; Matthew Van Alstyne, Peerless, and Edward Wright, Elmore. All three competed for the McClure cup with sealed bonnets and evolved with seals unbroken. The Locomobile for the third successive year made the run with a perfect score. Of the seven cars entered, five were from Albany, one from Ballston, and one from Troy.

HIGH-CLASS SPORT PROMISED AT ELKWOOD.

A high-class list of nominations has been made for the Fourth of July meet at Elkwood Park, Long Branch. In the sprint line a five-mile match race is featured with Harry Levey's Hotchkiss, driven by H. J. Kilpatrick; Walter Christie's direct-drive racer, piloted by Joseph Seymour, and E. R. Hollander's Fiat Cyclone, with George Robertson at the wheel.

In the 50 and 100-mile races, included among the entrants are Harry Michener, Lozier; Ralph de Palma, Allen-Kingston; Georges Renault, Mercedes; Maurice Bernin, Renault; Al. Poole, Isotta, and Stewart Elliott, American.

ALFRED REEVES IS NOW OUT OF DANGER.

Alfred Reeves, general manager of the American Motor Car Manufacturers' Association, who was operated upon for appendicitis at St. John's Hospital, Yonkers, last week, is now entirely out of danger. He expects to be able to leave the hospital for his home next Sunday. Later he will go to Lake Mahopac for a fortnight to recuperate.

WORCESTER'S ORPHANS HAVE OUTING.

WORCESTER, MASS., June 28.—The annual Orphans' Day outing was observed by members of the Worcester Automobile Club on Friday last. Only thirty-five cars were secured by the committee, who were consequently greatly disappointed. The date selected was only made known four days in advance, and in addition the dedication ceremonies of the memorial statue of the late Senator Hoar fell on the same day.

The committee, therefore, found it necessary to shorten the trips for the little waifs and to make the cars return and take another load. Because of several collisions during the parade last year, the committee this year had the cars report at the club quarters, and there assigned them to certain orphanages, and after they had got their loads they could go anywhere they cared to, there being no regular route.

NEW YORK CLUB'S "IDEAL TOUR" ENDED.

The survivors of the "Ideal Tour" of the Automobile Club of America, a dozen cars in all, reached New York on Sunday, having covered some 900 miles of road, for the most part in New England. The last day's trip was a jaunt of 102 miles from Waterbury, Conn., through Woodbury, Newtown, Danbury, North Salem, Cross River, White Plains and Yonkers.

Thursday's run was to Portsmouth, N. H., 81 miles. On Saturday the tourists made a 157-mile journey to Boston. At this point they numbered but nine. They were here reinforced, however, by Daniel Daly, Matheson and F. D. Hughes' Ford.

The participants pronounced themselves well pleased with the tour. There is talk of the club's repeating the experiment in the autumn, over a route of similar interest and good roads.

THE FACTORY BEHIND GREAT ARROW.

Under this title, the George N. Pierce Company, of Buffalo, N. Y., have just issued one of the most elaborate and attractive pieces of publicity work that an automobile company has ever undertaken. Descriptions of plants are nothing new—in fact, are all too familiar, but seldom does such a work show the painstaking care and attention that is revealed in this latest effort of the Pierce Company. It is a book measuring 10 by 12 inches, substantially bound in board covers of a dark neutral green, offset by the lighter green and gilt of the title, "The Factory Behind the Great Arrow Car," and the ornament emblazoning the cover. Most of its 70 odd pages are devoted to a description of the new Pierce plant which is a model of its kind. It is situated on the old Pan American exposition grounds and its various buildings are fitting companions to the artistic structures of a more enduring type that were left as a memento of the exposition held in that city during 1901.

The description of the various departments of the factory and its systems is by John Foord and is profusely illustrated, showing most of the important steps in the construction of the Pierce Great Arrow cars. The administration building, power plant, stock rooms, the machine and assembling departments, are each taken in turn and shown in detail, the reader of the work really enjoying the next best thing to a personal visit of inspection, to which the Pierce works are always open. Right up to the very last step in the handling of the car at the works, its placing in the freight car for shipment, is shown and then the remainder of the work is devoted to the Pierce product, with a pictorial introductory showing its evolution from 1901 down to the present.

YALE BOYS TO CROSS CONTINENT TWICE.

Charles T. Crocker, of San Francisco, and M. C. Scott, both students at Yale, left New York on Thursday in a 40-horsepower runabout with the intention of making a round trip to the Pacific Coast before college opens again next autumn.

The car has been especially equipped for the journey. There is one small seat behind for the mechanic, the remainder of the space behind the double front seat being taken up by a large provision box and some extra oil and gasoline tanks. The extra gasoline tanks have a capacity of 70 gallons of fuel and the extra oil tanks have a capacity of 30 gallons of lubricant. Two long boards to be used when the car gets into deep sand or into mud holes are carried on the car, along with several coils of wire rope. The tourists are carrying guns, ammunition and fishing tackle with them, as they expect to do considerable hunting and fishing.

QUAKER CITIZENS GET MORE TAXICABS.

PHILADELPHIA, June 20.—"We are now well launched in our business," said President John C. Hinckle, of the Pennsylvania Taximeter Cab Company to THE AUTOMOBILE representative last week. "With a dozen cabs already at work, we are to get a half-dozen more during the present week, and will have 25 at work by July 15. We are so situated that we can easily increase our equipment with the growth of the business."

The company as now organized has the following officers: President, John C. Hinckle; vice-president, Edward Malpass; secretary-treasurer, William C. Wilson; board of directors, John O. Gilmore, Mahlon Newton, John H. Simons, Claude Bennett.

SWINEHART INCORPORATES IN ILLINOIS.

The Swinehart Clincher Tire & Rubber Company has been granted a license to do business in Illinois, with a capital stock of $200,000, headquarters to be in Chicago. According to officers of the company no part of the plant is to be moved, but the object is to be able to begin legal proceedings to prosecute the alleged infringement of certain clincher tire patents that the Swinehart Company holds. Similar proceedings have already been started in Cleveland.

ANOTHER TIRE FACTORY FOR AKRON.

AKRON, O., June 29.—The Buckeye Rubber Company has added one more tire manufacturing plant to the many in this now celebrated city of tires in establishing a new factory for the special output of pneumatic tires, the company having decided to extend its business to that line. A building has just been put up adjoining the company's present plant. It is three stories high and 231 feet long by 40 feet wide. It is being equipped with the latest tire-making machinery, and S. S. Miller, the company' superintendent, says that manufacturing will be started in two months. The pneumatic tire to be manufactured will be a standard clincher type and has been made in an experimental way for the last year, being placed on the market in limited quantities. The success of the product led the company to take the present step.

The new factory will be devoted entirely to auto tires. The Buckeye company has its general offices in New York, and it has for some years been manufacturing in large quantities the well-known Kelly-Springfield solid buggy tires. It has been led to take the present step by the vast increase in the automobile tire business, which has been responsible for the great growth of the Goodrich, Diamond, Firestone and Goodyear factories, as well as of the Swinehart, Motz and other Akron makes, all of which have made Akron the chief rubber tire city of the United States. At present the tire plants are running day and night and doing the greatest business in their history, despite the recent setback that caused many other plants to shut down last fall.

CONTINENTAL GIVES PRIZES IN TIRE CONTEST.

What was probably a unique contest in automobiledom on this side of the water was held at the salesrooms of the Continental Caoutchouc Company, 1788 Broadway, New York, last Friday. The object was to determine how quickly a damaged tire could be removed and replaced with one of the new Continental "ready-flated" type, such as was used in the Briarcliff race this Spring. It was the first event of its kind ever held in New York City, and the attendance was consequently large. Each contestant was obliged to loosen and remove the demountable rim carrying the tire and place on the wheel in its stead another similar rim with an inflated tire on it, ready to run, this simple operation being all that is necessary with the Continental "ready-flated" equipment. The prize of $10 was won by R. Piccoli, who turned the trick in 59 seconds, the second prize of $5 going to Felix B. Faust.

SELDEN TO HAVE A BRANCH IN NEW YORK.

One of the latest comers to the metropolis to be represented by a branch house will be the new Selden car, which is the product of the Selden Motor Vehicle Company, of Rochester, N. Y., and the advent of which caused quite a ripple at the last show in the Garden, owing to the very low price the makers have put upon it. The Selden has been represented in this territory by the Palmer & Singer Manufacturing Company since early in the spring, but the makers have now decided to open a branch of their own, which will be located at 41 West Sixty-third street. For the present, it will be in charge of E. T. Birdsall, the designer of the car and chief engineer of the company.

PAGE COMPANY TO BUILD CARS AT PROVIDENCE.

PROVIDENCE, R. I., June 30.—The Page Motor Vehicle Company, recently chartered under the laws of Rhode Island, will begin operations at once at its headquarters, 288 Dyer street. It is expected that the first instalment of cars will be turned out in about three months. The location of the new plant has just been decided upon, but the manufacturers will not give out the detail of construction at present. The officers of the new company are: President, Dr. O. Fletcher; vice-president, Arthur A. Page; treasurer, Samuel J. Green; secretary, H. B. Vandergrift, the same officers also constituting the board of directors.

WHAT THE AUTO CLUBS ARE DOING JUST NOW

AUTO CLUB AND TEAMSTERS' UNION FUSE.

MINNEAPOLIS, MINN., June 29.—In the hope of securing better roads, the Minneapolis Automobile Club has entered politics. In conjunction with the Minneapolis Teamsters' Union the club will work and vote for the election of men for aldermen who, in the opinion of the club, will help the good road cause. The Automobile club has nearly a thousand and the teamsters 2,000 members. Theodore Wirth, superintendent of the Minneapolis parks, has the distinction of having been the first person elected to an honorary membership of the Automobile Club. He will assist in the good roads campaign.

From now on women will be eligible to membership in the club, action to that effect having been officially taken. The initiation fee of $25 will be waived, for a time at least. There are fifty women in this city who own automobiles.

Owing to the date for the Chicago hill climb being set for August 14, the tours and contest committee of the Minneapolis Automobile Club has decided to postpone the contest here until a date after the Windy City contest, so that the cars used there may be brought here.

PITTSBURGH CLUB'S TOUR TO BUFFALO.

PITTSBURGH, June 30.—Arrangements have been completed for the Automobile Club of Pittsburgh's run to Buffalo to the legislative and good roads convention. It will start next Sunday morning from the clubhouse, Baum and Deatly streets. Three pilots will precede the caravan, Edward J. Kent, starting at 7 A. M.; Edward Kneeland, at 8 A. M., and W. N. Murray, at 8.30 A. M. The tourists will rendezvous at Silver Creek, three miles west of Buffalo, on Monday, at 2.30 P. M., where they will be joined by the other clubs of Western Pennsylvania so as to enter Buffalo in a body. The route to be taken follows: East Liberty, 0 miles; Zelienople, 30; Mercer, 62; Sheakleyville, 77; Meadville, 94; Saegertown, 102; Cambridge Springs, 110; Erie, 130; Fredonia, 178; Silver Creek, 190; Buffalo, 224.

This division is but one of the three that are being organized by the Pennsylvania Motor Federation.

IN AND AROUND CONNECTICUT'S CAPITAL.

HARTFORD, June 30.—The gymkhana of the Automobile Club of Hartford, which was held at Charter Oak Park in connection with the Hartford Hospital benefit, was a most successful affair. About four thousand were in attendance. Practically all came in motor cars, many of which were very tastefully decorated. There were six events on the program, three for ladies and three for gentlemen. These were run off on the broad lawn under the shade trees.

The autoists of Torrington will soon form an automobile club, and it is expected that definite action will be taken within a few days. As soon as the formal organization takes place the club will make application for membership in the State association and the American Automobile Association.

SALT LAKE CITY AUTOISTS ORGANIZE.

SALT LAKE CITY, June 27.—With every prospect of success and a very good chance of soon having their own clubhouse, local owners have organized the Salt Lake Automobile Club.

Among those present at the meeting were James J. Brosoit, Van D. Spalding, O. W. Powers, O. H. Hewlett, Dr. H. N. Mayo, J. E. Jennings, C. R. Pearsall, R. W. Salisbury, Frank Botterill, Lewis S. Hills, L. B. McCornick, J. Frank Judge, H. A. McCornick, Dr. H. D. Niles, A. C. Ellis, Jr., F. A. Babcock, Jr., L. L. Terry and Joseph Nelson, H. W. Walker, F. C. Schramm and Mayor J. S. Bransford telephoned to have their names added to the list of members.

SPRINGFIELD, MASS., TO HAVE HILL CLIMB.

SPRINGFIELD, MASS., June 30.—The Automobile Club of Springfield has voted to hold a hill-climb over the Wilbraham Mountain road, a distance of only a few miles from this city, some time next autumn. The directors of the club have given the committee in charge carte blanche, so far as expense is concerned, and it is expected to make this test one of the most memorable in this kind of competition.

The Wilbraham Mountain road has but one place that could be called dangerous, and this will be eliminated at an expense of two or three hundred dollars. The grade, which, it is believed, will average about 12 per cent., runs in some places as high as 23 per cent. It will be surveyed at once. The test will be classified according to horsepower and selling price, and valuable cups will be offered as premiums.

THE BLUE GRASS CLUB IS A HUSTLER.

LOUISVILLE, KY., June 30.—The Louisville Automobile Club's president, Pike Campbell, in his monthly letter to the members for June, expresses confidence that by the annual election the club's roster will show 250 members, 37 new names having been added to the roll since April 1. Every effort is being made to add influential men to the roll to assist the club in its campaign against drastic laws and ordinances.

The club has already accomplished much. The toll on the Kentucky and Indiana bridge has been reduced. Holes in the streets have been repaired. Arrests and fines have been averted. The orphans were given their annual ride. How hard the club's officials are hustling may be judged from the fact that during the past month 2,200 communications were mailed from the secretary's office.

PEARSALL BRIDGEPORT ORPHANS' HOST.

BRIDGEPORT, CONN., June 27.—Orphans' Day was celebrated last week by the Automobile Club of Bridgeport giving 100 orphans a ride around the city and suburbs ending at the handsome estate of Thomas W. Pearsall at Black Rock. Mr. Pearsall's large stone garage was profusely decorated with flags, and the children were entertained by a fine collation provided by him. Music on the graphophone was furnished by Mrs. Pearsall. Twenty-eight large touring cars were used in the trip, the ride being in charge of F. W. Bolande, secretary of the automobile club; Ralph M. Sperry, chairman of the contest committee, and Bernhard Setzer. This is the second time that Mr. Pearsall has entertained the orphans in this manner.

ST. PAUL CLUB IS TO AID THE POLICE.

ST. PAUL, MINN., June 29.—By official action and formal resolution the St. Paul Automobile Club has decided to do all it can to stop the reckless handling of automobiles by making each one of its members a monitor, whose business it will be to report and bring about the punishment of offenders of the speed laws. The organization will also do what it can to annihilate the meanest of all automobile drivers—the fellow who, following an accident, turns on the throttle and speeds away. A reward of $50 for information leading to the identification of every such offender. A reward of $50 will also be paid for the arrest and conviction of the thief who steals a machine belonging to a member of the club.

FLORIDIANS TO RAISE FLAG ON FOURTH.

DAYTONA, FLA., June 29.—The Florida East Coast Automobile Club will raise its new flag on the Fourth of July. The club has recently spent over $1,000 in improvements on its clubhouse on the famous Ormond-Daytona racing beach.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

The salesmen of the Franklin factory will take their annual vacations July 3 to 20. Immediately after their vacations the Franklin salesmen will go to the factory at Syracuse, N. Y., for the annual salesmen's conference.

Alexander Winton has decided not to allow any chauffeur in the $2,500 Six-Teen-Six contest to go unrewarded. After the judges have chosen the ten money winners, special additional awards will be made to the remaining contestants. Reports already received indicate that the final records will show some exceptionally fine performances to the credit of the Six-Teen-Six.

Within about two weeks the Speedwell Motor Car Company, Dayton, O., will have completed another spacious shipping warehouse which is now being erected on the spur track which the Big Four Railroad bas installed. The new building will be used for a shipping warehouse, and is of concrete and steel construction. It is 200 by 30 feet. The company still employs two sbifts of men, and the output for next year, according to General Manager Loomis, will be about five times that of the present year.

According to the K-W Ignition Company, Cleveland, O., the "sun never sets on the K-W magneto," as they have now made sbipments to points all over the globe, a number of the machines having been sent to China, India, Japan and the Pbilippines, as well as to South American countries. The K-W magnetos are enlisting for themselves a host of enthusiastic users in this country from coast to coast, and autoists who have oncc placed one of them on their cars would never think of again returning to a battery for ignition.

According to his usual custom, Colonel James H. Sprague, of Norwalk, O., who has achieved for himself the title of the "canopy autocrat," will hold open house on the Fourth, and with his customary generosity has extended an invitation for every one in the trade to help him celebrate Independence Day in a much more fitting, if less noisy manner, than is usually followed. The invitation takes the form of a giant cracker, and beside extending a most cordial request to make merry with the Colonel from 2 to 6 P.M. on that day, includes an apt picce of poetry entitled "Smile."

With its last phenomenal victory on Skippack Hill, in which it made the unprecedented speed of 74 2-5 miles per hour up a steep grade of 1 1-5 miles, the Great Chadwick Six won the culminating event of a long line of hill-climbing victories that has seldom been approached either here or abroad. In fact, a careful review of existing rccords is said to show that the Chadwick's average speed on Skippack was faster than has ever been attained previously by an automobile in any hill-climbing contest. In the past month or so the Chadwick stock car has swept away all records, defeating by generous margins all competitors in the four big hill climbs of the year, Wilkes-Barre, Worcester, Cleveland and Skippack, in the last named of which a number of famous stock cars and racing machines were beaten by 16 2-5 seconds.

Chairman Frank B. Hower announces that the two pilot and confetti cars selected for the fifth annual A. A. A. reliability touring contest are a six-cylinder Premier "45" touring car and a Reo "20" touring car. A six-cylinder Premier "45" was used in successfully laying out the 1908 route early in May, last, when the heavy rains, deep mud and rough country roads put the pathfinding party and car to a severe test. The companion pilot car—a Reo "20"—is a $1,250 model, one of which created the great sensation in the 1907 Glidden reliability touring contest by being the only car of 83 starters selling under $2,250 which finished with a perfect score, and then made its 500-mile official non-stop dash immediately thereafter, from New York to the Jamestown Exposition, in 23 1-2 hours.

The Renault people intend eventually to occupy the same place in America in the taxi business as thcy now do in France, where 2,000 cabs are in daily use in Paris streets, while the Renault factory has an order for an additional 1,000 cabs for another Paris taximeter company now forming. London is a close second, with 1,500 cabs in daily use in her streets, and an order already placed for 500 more for a new English company. Paul Lacroix, General Manager of Renault Frères, announces that the Auto Taxicab Company of Chicago, recently incorporated, to use Renault taxicabs exclusively, have placed their first order for 50 cabs. In New York the Motor Taximeter Cab Company, incorporated with a capital of $150,000, has taken over the entire Renault Taxi Service, heretofore opcrated by Renault Frères, and has ordered 50 more cabs. They use Renault taxicabs exclusively, two types, 10-14 horsepower, 4 cylinders, and 8-10 horsepower, 2 cylinders, the experience of three years in Paris showing the Renaults are the only cabs that successfully stand the strain.

NEW AGENCIES ESTABLISHED.

The Schacht auto buggy has made its appearance in Philadelphia, D. Applegate & Company. 336 North Broad street, having secured the local agency for the high-wheel vehicle, the first of its kind to be exploited in the Quaker City.

The E. L. Leinbach Auto Company, 2312 Madison avenue, Baltimore, local agents for the Stearns car, have added the Oldsmobile to their list of agencies there, while the Arbee Auto Company, William C. Blome, president, has just opened up in this city. Tbe firm has the Baltimore agency for the Moon car.

Having abandoned its agency representation in Philadelphia, the Matheson Company, of Wilkes-Barre, has been quietly looking around for a suitable location for thc establishment of a branch house. The matter was settled last week by the announcement that permanent quarters had been secured at the northwest corner of Broad and Green streets, and that W. Wayne Davis had been appointed manager of thc new Quaker City branch.

Since the announcement of the new Chalmers-Detroit car at $1,500 and the Chalmers-Detroit Forty for 1909, the Chalmers-Detroit Motor Company has renewed contracts and closed up a great many dealers for the coming year. Among those who have signed contracts within the last week are Charles B. Shanks, formerly sales manager of the Winton Motor Carriage Company, who takes Cleveland and northern Ohio; I. H. McDuffee, a veteran auto man, who will handle the Chalmers-Detroit line in Colorado, Wyoming and New Mexico, with Denver as his headquarters; C. E. Whitten, of Boston, Capital City Garage, of Montgomery, Ala.; The W. L. Hibbard Motor Car Company, of Milwaukee; E. P. Moriarty Company, of Kansas City; Fort Dodge Automobile Company, of Fort Dodge, Ia.; Chas. I. Durheim, of Muskegon, Mich.; Newark Garage & Repair Company, of Newark, N. J., and the Barclay Auto Company, of Minneapolis.

PERSONAL TRADE MENTION.

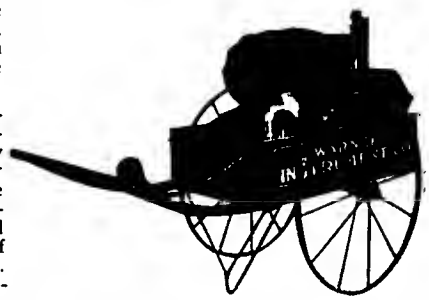
Henry Lomb, one of the founders of the Bausch & Lomb Optical Company, Rochester, N. Y., passed away on June 13, in that city. Mr. Lomb was almost eighty years of age, and his long and most successful career closes a line of achievements in the optical world that have seldom been equaled.

Charles W. Churchill, former manager of the Winton branch at New York, has gone to Clevcland to take up his new duties as sales manager of the Winton Motor Carriage Company. Charles Brown, manager of the San Francisco branch, will leave a fortnight hence to take Mr. Churchill's place.

James F. Fairman, for some time identified with the sales force of the New York & New Jersey Lubricant Company, New York, has severed his connection with that concern, to take a position with the Wilson Trading Company, 179 Greenwich street and 46 Cortlandt street, wholesale and retail dealers in auto tires, sundries and the like.

WARNER'S "AUTO-METER ARTIE."

After years of experience with the average office boy, one firm in the West, the Warner Instrument Company, of Beloit, Wis., have hit upon a clever scheme by which they have successfully tamed that specimen of procrastination. The Warner Company have fitted their mail cart with a Warner Auto-Meter and odometer combined, and by this means are pretty nearly able to tell just where the office boy has been when he returns with the mail cart.



According to President Warner, of the Warner Instrument Company, it is now a matter of record around the Warner office that since the autometer was placed upon the car the boy has become greatly interested and takes great pleasure in trying to make record runs to the post office, and the speed he can get out of the two-wheeled cart and the stories he tells have made him the envy of the other urchins who fill similar rôles in the business offices of Beliot's factories. It is also noticeable that the cart is equipped with a large automobile born to enable him to make speed.

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SPECIAL NOTICES

Advertisements inserted under this heading at 20 cents per line; about 7 words make a line. Remittance should accompany copy. Replies forwarded, if postage is furnished.

Cars for Sale

A 1907 PACKARD touring car in A1 condition, with full equipment; price, $3,750. Address Box 91, cars The Automobile.

A 30 H.P. DeDetrich touring car for $600, and ons 1906 three-cylinder Elmors for $550. For furthsr particulars address, F. E. Lockwood & Co., 39 Wall St., Norwalk, Conn.

A TOURING CAR, seats five, good condition; complets, extras. EWELL, 898 Bedford Ave., Brooklyn, N. Y.

AUTO CAR RUNABOUT, just overhauled and painted, in good condition, will bs sold cheap if taken at once. Inquire 29 Main St., Bristol, Conn.

BUICK 1907 model, two-cylinder, 22-h.p.; a sample car, otherwise absolutely new. Cost $1,375. Yours for $1,175. Furthsr particulars and photo upon request. Halssy Auto Co., 3908 Olive St., St. Louis, Mo.

CADILLAC Runabout, fine condition, three new tires; no reasonable offer refused, as it must be sold at once. A. Schnell, 165 Grand St., Brooklyn, N. Y.

CORBIN Touring Cars and Runabouts, $800 and up. Thoroughly overhauled by us and guaranteed. Corbin Motor Vehicle Corp'n of N. Y., 1888 Broadway, near 62nd St., New York City.

ELEGANT 1907 Pope-Toledo Roadster, fully equipped with Eisemann magneto, five lamps, Prest-o-Lits tank, top, extra tire with covsr, etc. One of the finest outfits in Buffalo. A bargain for quick sale. E. R. Thomas Motor Company, Second-hand Dept., 1200 Niagara St., Buffalo, N. Y.

GET WISE—We have anything you want in second-hand cars—Packards, Wintons, Locomobilee, White Stsamers, Franklins, Buicks, Oidsmobiles—and bargains at that. Ths Sld Black Automobile Co., 630 Walnut St., Cincinnati, Ohio.

MODEL M Cadillac Runabout; 4 new tires complete; 5 lights; new sprockets and chain; reason for selling, purchased new Cadillac touring car; no reasonable offer refused. W. L. Gray, Bullford, Conn.

NEW AUTOMOBILES that are strictly guaranteed, bought for cash, of overstocked manufacturers at forced sale prices, for immsdiate delivery and quick sale profits. They includs Dolsons, Queens, Dragons, Orient Buckboards, Walthams, and numerous others. Apply for descriptive list and prices. If you are about to buy a second-hand car, do not fail to consult us. We have on our sales floors and rsady for delivery, about every make of automobile there is. They are all substantial and well built cars that have been thoroughly overhauled in our shops and are equal to new both in reliability and appearance. We ask you on an average about one-fourth the original cost. They range in price from $250 to $3,000. We will gladly mail you our weekly list upon request. We have ths largest and most complets stock of automobile supplies in America, and can give you cut prices on evsrything. We make a specialty of tires, have an immenss stock on hand, of the best makes and can give you bargain counter prices. Send for our new 100-page catalogue and souvsnir. The former is a dandy, and the latter, unique. Times Square Automobile Co., largest dealers in new and second-hand automobiles in the world, 1599 Broadway, New York, and 1332 Michigan Ave., Chicago, Ill.

MAXWELL 1907, 20-h.p. touring car. Seats five. Motor brand new; paint and tirss in fine condition; fully equipped throughout; fine top; five lamps; clock; extra tire and tire holdere; tire cover; tool box; tools, parts, etc. Bought another car, must sell this one. Act quickly. Maxwell Owner, care The Automobile.

ONE 1905 French type Oldsmobile runabout; good condition; minus tires; $175. Frank Herbst, Wilmington, N. C.

POPE-HARTFORD Model B, improved, at at $400. Lock Box 323, Barrs, Vt.

PACKARD 1905 Touring Car. First check ior $1,500 obtains this bargain. This car has just been overhauled throughout, is fast and reliable. Cost complete $3,900. Send for photo and further particulars. Haisey Auto Co., 3908 Olive St., St. Louis, Mo.

POPE-HARTFORD, four-passenger, automobile in good condition, for sale or exchange. Wanted, cash or good land improved or unimproved, preferably in this or adjoining state. Write if you mean business. Dr. W. M. Martin, Wellington, Kan.

RUNABOUT in good condition; equipped with three lamps, top, and new 8-h.p. Illinois engine; $250. Jos. Rohleder, Peoria, Ill.

STEAM AUTOMOBILES—Write for bargain list. F. W. Ofeldt & Sons, Nyack, N. Y.

STEVENS-DURYEA light touring, four-cylinder, Model R. Condition perfect. Car nswly painted for owner. Will sacrifice as havs purchassd another car. Under Thousand, care The Automobile.

TIMES SQUARE Automobile Company, largest dealers of new and ueed automobiles in world. Send for our list of cars on hand; send for our big 100-pags catalogue; everything at cut prices. 1599-1601 Broadway, New York City, and 1332-1334 Michigan Ave., Chicago, Ill.

TOLEDO steam runabout, $65; Rambler runabout, singie-cylinder, 8-h.p., $150; 20-h.p., 2-cylinder Winton, $250. E. S. Youse, Reading, Pa.

USED BAKER ELECTRICS.—In excellent condition for giving tbe good satisfaction which is assured by the nams of "BAKER." Wire Wheel Runabout..... $400.00
Imperial 650.00
Suburban 1,050.00
Surrey 900.00
All cars have been thoroughly overhauled and nsw batteries put in. Baker Motor Veh. Co., 1790 Broadway, New York City.

WE ars going to eell every second-hand car we have regardless of their real value, as we must have the room for other purposes. Thess include some exceptionally fine propositions, from two-passenger runabouts to seven-passenger touring cars. Get our list and make us an offer. E. R. Thomas Motor Company, Second-hand Department, 1200 Niagara St., Buffalo, N. Y.

WELSH Touring Car, 1907 model. Run less than 5,000 miles. Tires in good shape. A genuine bargain at $2,500. Haleey Auto Co., 3908 Olive St., St. Louis, Mo.

WHITE STEAMER—1906, with '08 regulation equipment; double brakes on rear axles, demi-limousins body, with long doors, cape top, glass front, full set lamps; prics $1,500, complete. Address Box 39, care Ths Automobile.

WHITE STEAMER, Model F, in sxcellent condition. A. F. Crittenden, 32 Main St., East, Rochester, N. Y.

WINTON, 1907 Model M; top and dust cover, tire holders and tire case; sxtra tire; folding glass front; speedometer and gas tank; two extra tonneau seats; Kilgors shock absorbers; cost new $4,000; will sell for $2,250 and guarantee in first-class condition. C. C. Stoitz, Marion, Ohio.

WE ACT AS BROKERS for ths quick sale of second-hand cars; we charge the owners only 5 per cent. commission. In this way we get a great many bargains from owners who, for various reasons, want money rather than the car. We can put you in touch with the owner, and you can often buy at your own price. Ws have always on hand from 100 to 200 cars of practically every make. Ws issue a weekly list of cars on hand which we will mail you on application. The following ars speciai snaps for this week:

Mercedes, four-cylinder, 28-32-h.p. limousine, with extra touring body; fully equipped and cost over $10,700. Call, examine car, and make best cash offer. Six-cylinder National touring car, that originally cost $6,500; 50 to 60-h.p., 7-passenger, complete equipment of five lamps, horn, caps top, curtains, etc. Winton, K 1906, 4-cylinder, 40-h.p. touring car, of magnificent appearance, largs searchlighte, side lamps, horn and other extras; cost $3,500. Whits Steamer touring car, 18-h.p., lamps, tools, top, and good tires; fins order, and ready for use; originally cost $2,500. Columbia Electric Brougham, undersiung batteries, finished in morocco, solid tires, Samsonized, magnificent for opera use; cost owner $3,500. Four-cylinder Richard Brazier; cost $4,000; side entrance, full equipment, top, good tires, etc. Pope Toledo touring car, 4-cylinder, 30 to 35-h.p., eide entrance, just thoroughly overhauled and in fine order; cost $4,300. Waverly Electric Runabout, newly painted, side lamps, tools, good condition. Columbia Electric Runabout, solid tires, good batteries, and top. Mason Enginss, two, 4 1-2-h.p., 2-cylinder; suitable for autos or boats; cost $150. Manhattan Storage Co., 334 West 44th St., New York City.

'06 K WINTON, 35 H, top, glass front; Al condition; $1,050; coet $2,600. A. L. Sheridan, La Fayette, Ind.

1907 STANLEY Steamer Model F Touring Car; high grade top, tool box, robe rail, electric gauge and tail lamp; boiler in strictly first-class condition; car thoroughly overhauled; owner going to Alaska. Full dstailed information and price on request. Hawthorns Auto Co., Mason City, Iowa.

1908 MODEL G Marmon Touring Car, 35-40-h.p.; as good as new. Full equipment, including top, etc. Reason for selling, owner has ordered a larger and mors powerful car of the same make. Brazler Automobile Works, 38th and Market Sts., Philadelphia, Pa.

Cars Wanted

I AM in ths market for a 1906 Peerless Touring Car. In replying state price and condition. Box 92, care Ths Automobile.

WANTED—Franklin Runahout, model G, 1906, 1907; give complete description; lowest price for cash. Dr. J. H. Bryan, Asbury Park, N. J.

WANTED—Model R, 1907 Ford, four-cylinder Runabout at once. Stats full particulars and lowest cash price in first letter. Address D. E. Sunderland, 98 and 100 Mechanic St., Freeport, Ill.

WE WILL PAY full value in spot cash for ff your automobiles, in quantities from one to one hundred. Call or mail descriptions. Broadway Mammoth Automobile Exchange, 245 West 56th St., New York City.

WILL buy 1906 Peerless Touring Car at once. Quote price and condition. H. C. Mayo, 69 Fourth St., Wellington, Mass.

(Special Notices continued from page 42.)

Parts and Accessories

(FOR SALE)

AUTO TIRES—All the best makes of tires on hand, at cut prices; a big stock of "specials" and "seconds" at "Bargain Counter Prices"; we will sava you monsy on any make and any size; write or call. Broadway Mammotb Automobile Exchange, 245 West 56th St., Naw York City.

AUTO TIRES—New and second-hand auto tires at larga discounts; expert repair work, including recoverinig and applying of Bailey treads, etc. Broadway Rubber Tire Works, 58 West 63d St., near Broadway, New York City. 'Phona 5384 Columbus.

AUTOMOBILE TIRES—Overstocked with second-hand casings and tubes, all sizes, right prices; tire rapairing, recovering, rebuilding; best workmanship and material. All work done on short notice. Tel., Harrison 7801. Bebber & Coen, 831 Michigan Ave., Chicago, Ill.

BODIES—We hava a few 5-passenger touring car bodies, in two sizes: 69 1-2x34 1-2 on bottom, price $40; 80x34 1-2, price $50. Ara new bodies, finishad in Quaker green, upholetered with curled hair and genuina leather; prices cash with order, f.o.b. cars Waltham, crated. Illustration and blueprints showing all dimensions ssnt upon request. We also have a few 1908 model steering columns with worm gear for sala. Waltham Mfg. Co., Waltham, Mass.

BOWSER Gasolene Pump and 800-gallon Tank, with 30 feet of pipe, complete. Guaranteed by the manufacturer until October, 1909. Make a cash offer. Address Garage, care The Automobile.

BRAND new 4-cylinder Connecticut dash coil, $27; one Splitdorf 4-cylinder dash, $17; ona two-cylinder, $10. Charles A. Vuille, Huntingdon, Pa.

FOR SALE—300 sets 28x3 best grade artillery wheals fitted with clincher rims, less hubs; write for bargain prices on single sets or the lot. Thomas B. Jeffery & Co., Kenosha, Wis.

FORD RUNABOUT OWNERS—You can make a handsoma "Roadster" of your car, with our rumble seat and trunk, glass front, new fenders with brass bound running boards, folding hood, "hood dash," atc.; send for catalogue; avoid spring rush; order now and sava money. Auto Rebuilding Co., Chicago, Ill.

FOUR-CYLINDER air-cooled motors, $100; wood wheels, $15 per set; sliding gear transmissions, $20; worm gear wheel steering devices, $22; planetary transmissions, $20; opposed motor, $65; spark coils, $2 aach. Auto Parts Co., 99 W. Monroe St., Chicago, Ill.

KINGSTON CARBURETERS.—Model C, 1907, new 1 1-4-inch, $4; 1 1-2-inch, $4.50; Universal Model D, 1907, naw 1-inch, $3.50; Holley, slightly used, Model E, 1 1-4-inch, $3; 1 1-2-inch, $3.50; a few 1 1-4-inch Scheblar, Buffalo, and Universal at $5. McLean & Brotherton, 78 Home Bank Bldg., Detroit, Mich.

REBUILD YOUR CAR into "Gentleman's Roadster." We maka latest style hoods, radiators, tanks, fenders, "hood dashas," glass fronts, rumble seats and trunks, atc. 20 per cent. saved, your old car redasigned free. Hood and dash outfits for '03 and '04 Ford, Cadillac and Winton in stock. State your needs for catalogue. Auto Rebuilding Co., Chicago, Ill.

SINGLE CARBURETER OUTFITS, '05-'06 Reo, '05-'06 Ford, Maxwell, Buick, Cadillac; also commutators, slip covers, top hoods, under shields, folding fronts, running boards, mud splashars, tire protectors. All specialties. Stata your wants. Jenkins Specialty Mfg. Co., Sumter, S. C.

TIRES for automobiles; brand new goods; overstocked; 28x2 1-2, $8; 28x3, $14.50; 28x3 1-2, $14.80; 30x3, $14; 30x3 1-2, $16.50; 30x4, $18.75; 32x4, $20; write for other eizes; will surprise you. A. H. Kasner, 152 Church St., New York. Largest Tira Dealers in U. S.

TIRES—We sell any tire on the market; new casings at the following prices: 28x2 1-2, $9 each; 28x3, $17 each; 30x3 1-2, $20 each; 32x4, $26 each; 34x4, $27 each; other sizes and tubes in proportion. Chicago Vulcanizing Co., 1463 Michigan Ave., Chicago, Ill.

4x4 AIR-COOLED opposed motor, new, $75. Would take second-hand enginee in trade. Comet Motor Works, Madison & Canal Sts., Chicago, Ill.

$55 BUYS 7-h.p. Auto Engine, transmission, tanks, etc., complete; perfect condition. M. P. Cushing, Dedham, Mass.

Situations Wanted

DRAFTSMAN-DESIGNER, dssires position; long practical experience, thoroughly in touch witb latest practice, and competent to assuma entire charge of drafting and designing departments. For refsrences and complete particulars, address Box 81, care The Automobile.

POSITION wanted by expart auto repair man as chauffeur. Address Matthews, cara Tha Automobile.

SALESMAN wants agency for specialties, or a line suitable for the New England automobile trade. Address Box 780, care The Automobile.

Help Wanted

WANTED—By a prominent automobila manufacturer, salesman of experience as district manager. Address, giving experience, references, and salary expected. Box 33, care The Automobile.

Insurance

INSURANCE for automobiles—Broad, safa policies at lowest prices; insuranca against fire, self-ignitad explosions, transportation hazards, theft, etc.; best services guaranteed, no matter where insurar is located. For particulars, address H. W. Beals, 76 William St., New York City. 'Phone, 8052 John.

INSURANCE for motor cars against evary risk, including fire, explosion, self-ignition, theft, collision, accident, transportation, perils and otber damages; cars insured anywhere in the world by the kind of "Policies that Protect," at the lowest rates of premiums; automobila bail bonds to cover all States; demonstrating policies for the trade. Dixie Hines, Times Building, New York City.

Schools

THE AUTOMOBILE industry offers a great opportunity for the ambitious man to secure a permanent paying profession. Its growth has been marvelous. It is yat in its infancy. New York City alona will requira within two years 5,000 taxicab drivers; commarcial vehicles as many more. A competent, careful driver is always in demand for pleasure cars. The supply is limited and the salaries high; the associations are first-class. Wa can make you a skilled driver, mechanician or salesman. Also coursa on automobile designing. Write us now for prospectus of terms, etc. Naw York School of Automobila Engineers, Inc., 145 West 56tb St., New York City.

817 MEN who enrolled in our automobile school last season say their time and money were well invested. Our courses are thorough and practical. We have a large garage, completely equipped, and expert instructors. The school is not run to maka monay, but to give men a thorough course of instruction at a minimum cost. Catalog sent on request. West Sida Y. M. C. A., 310 West 57th St., New York City.

Miscellaneous

AUTOMOBILE TIRES rebuilt, retreaded, relined, rim cuts and blow-outs repaired, inner tubes repaired and respliced; all work thoroughly tested before shipment, and fully guaranteed. Thomas Rubber Vulcanizing Co., 227 South St. Joseph St., South Bend, Ind.

CARRY A BURROWES emergancy rim or spare wheel on stap of your car, all inflated ready to clamp to sida of car wheel. No need of removing punctured tire till you get home. Local agants wanted. E. T. Burrowes & Co., Portland, Me.

CLASSIFIED LIST all licensed automobila owners in Iowa, compiled by towns and alphabetically arranged to June 1, 1908. Ona dollar per copy, postpaid. Address W. J. Wallaca, care Sears-Nottinger Co., Des Moines, Iowa.

CHAUFFEURS, machinists and repairmen can secure, free, a set of Bullard wrenches; write us for special offer. Bullard Automatic Wrench Co., Providence, R. I.

STOLEN; STOP THIEF; $200 REWARD.—No. 701 Studebaker touring car, deep red, black trimmed, brick red gear, paint scraped off right fender, Rushmore lamps, tires smootb and Bailey traad, tripla springs. Harry Wood, 871 Warren Ave., Chicago.

THE AUTOMOBILE HAND BOOK.—By L. Elliott Brookes. Over 100,000 copies sold. This sale guarantees absolute authority. This work was written to supply practical information to automobile owners, operators and chauffeurs, including road, motor, carbureter, ignition, battery, clutch and starting troubiss, with information of value to automobile mechanics. Pages, 480. Over 180 illustrations. Leather bound, $1.50. Frederick J. Drake & Co., 214 Fisher Bldg., Cbicago, Ill.

TIRE REPAIRING is our business, and we know that our vulcanized repairs give satisfaction to our patrons. Why not give us a trial? Onca a customer, always a customer of the Model Vulcanizing Co., 1547 Michigan Ave., Chicago, Ill.

TIRES—Retread or repair them yourself without removing thsm from wheel. Kracker Jack Vulcanizer Co., 1122 Pine St., St. Louis, Mo.

TIRES REPAIRED—Automobile owners, do you want your tires repaired or recovered by people who know how? Give us a trial and be convinced. Inner tubes vulcanized at short notice. Jungkind & Vogisr, 158 Chambars St., New York City. Telephone, 8886 Cortiandt.

TIRES REPAIRED and retreaded—All work guaranteed. We have tha largest and best-equipped tirs repair shop in tbe West, and experienced men to do the work. Best materials and workmanship only. A complete lina of Morgan & Wright tires carried in stock. Auto Tire Co., agents Morgan & Wright, 605-7 East 15th St., Kansas City, Mo.

WM. SANFORD, JR., dealar in Automobila Tires, 42 West 67tb St., New York. Perfect, scientific and honest repair work a specialty.

SPECIAL NOTICES

TOO LATE TO CLASSIFY

FOR SALE—ELMORE.—On account of leaving the city for several months, I will sell my new Model 40 Elmore for $2,250. H Stewart, 1020 Main St., Cincinnati.

FIRST-CLASS MECHANIC and chauffeur desires position driving; fiva years' experience, driving and repairing all makes of gas. cars. Sober; best references. Address Box 165, Hampton, Iowa.

WANTED—Cylinder for Olds runabout 1903. Boiler and burner for Mason engine, 4 1-2-h.p. Address G. W. Hall, Box 204, Little Britain, Ont., Can.

G&J TIRES

That Have Run 8454 Miles

¶ The car is owned by Mr. C. R. Forth, of Mansfield, Ohio. He has written us as follows: "The distance I have covered with the tires you got a photograph of is 8454 miles. They have never been punctured and have been pumped up only once."

¶ Good tires have much to do with the economy as well as the comfort of automobiling. To equip with G & J tires means absolute satisfaction to the owner as well as perfect security in the knowledge that no better tires are made.

¶ If you need any new tires this season and are still undecided which are the *best*, drop us a line and we will give you some surprising facts.

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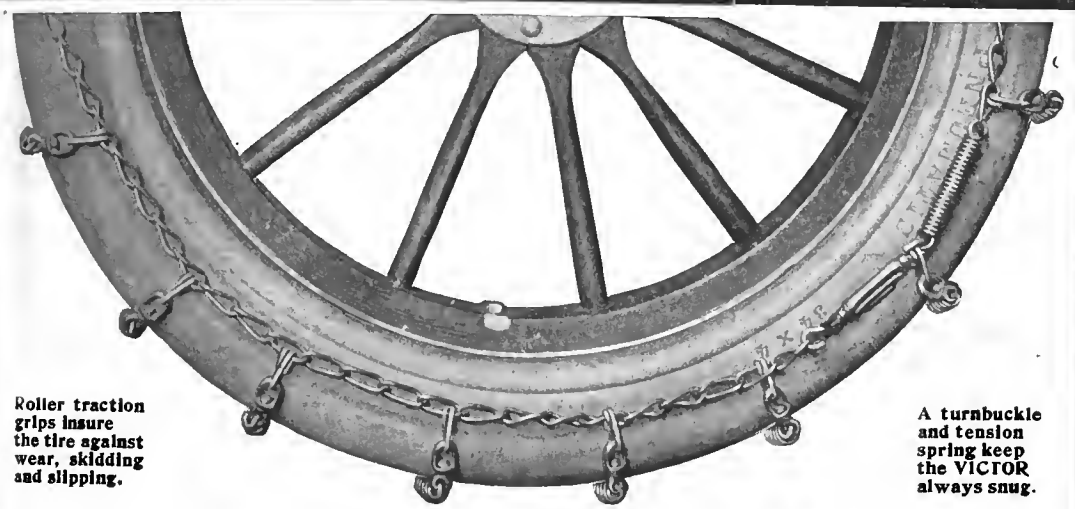

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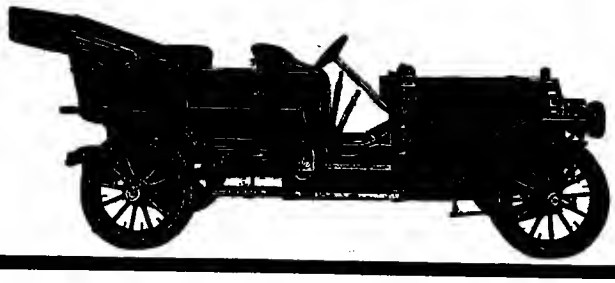

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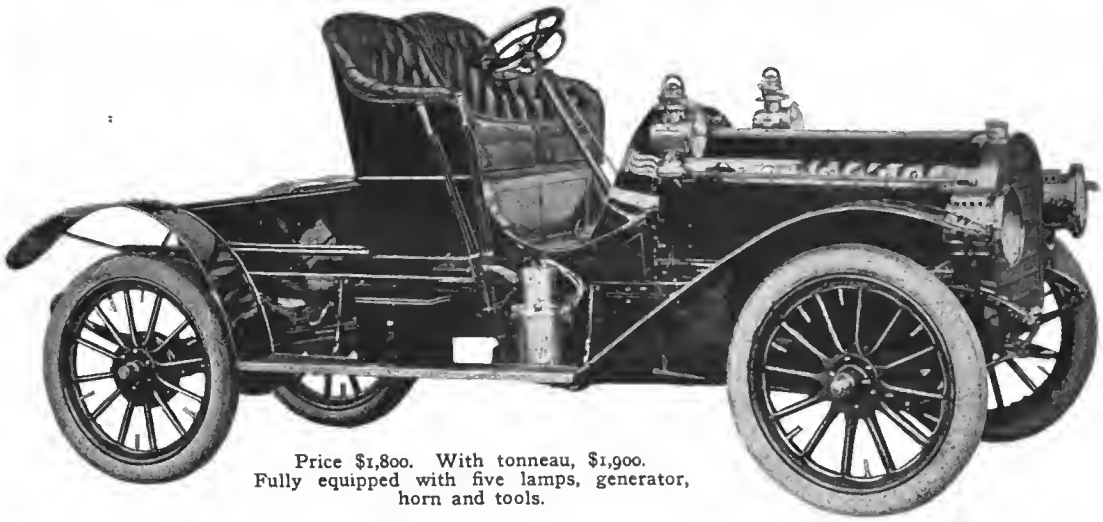
MODEL 248



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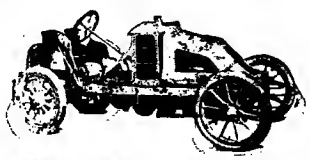

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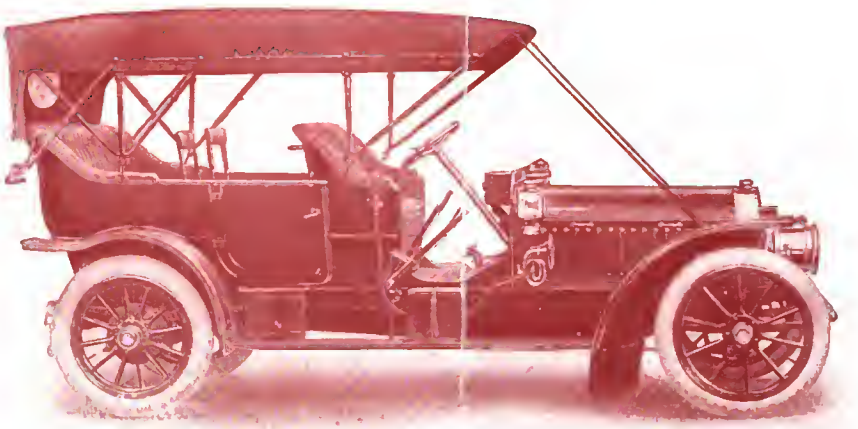

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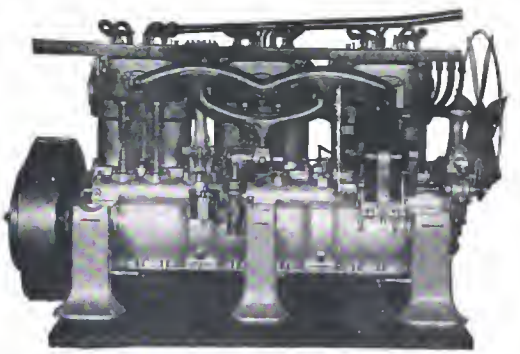

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2461 Oakdale Street **Cleveland, Ohio**

VOL. XIX NEW YORK—THURSDAY, JULY 9, 1908—CHICAGO No. 2

THE AUTOMOBILE

Rain failed to stop Independence Day Meet at Long Branch

Elkwood Park's Wide Course Showed Up In Magnificent Shape When the Competing Cars Faced the Starter.

HISTORIC old Monmouth county, New Jersey, famous as the birthplace of Moll Pitcher, of the Revolution, and of Arthur Augustus Zimmerman, greatest of all bicycle riders, too, gave to motordom on the Fourth of July a multi-millionaire meet. Crusty old Jupiter Pluvius frowned upon it and stormed upon it, but his cloud bursts could not quench the enthusiasm of the Guggenheims, the Lewisohns, W. E. D. Stokes, and the other plethoric promoters a little bit nor stop for more than a quarter of an hour at a time the racing at the old Elkwood Park mile trotting circuit at Long Branch.

The promotion of the meet was a praiseworthy bit of simon-pure sportsmanship on the part of the automobile enthusiasts of the Jersey coast summer colony. They spent money without stint to insure first-class sport. For a fortnight before the Fourth the track was worked and a week ahead was treated with 9,000 barrels of oil to insure against dust. Liberal purses were put up to attract the best cars and drivers in the metropolitan district, and the response was generous. The grandstand was elaborately decorated with flags and bunting. The visiting racing men and scribes were brought to Long Branch in special parlor cars, lunched elaborately at Pannaci's and sent away full of choice viands and good cheer after a rousing clambake at Pleasure Bay.

The Copper Crœsuses and money magnates were not looking for any profits either for themselves, having in advance promised the surplus proceeds to the local hospital. How much of a surplus the rain allowed is to a considerable extent dependent on the truth of a story that received wide circulation and was vouched for by Tom Moore, who managed the meet, to the effect that the management with characteristic business prudence had insured against one-tenth of an inch of rainfall with the Lloyds, accepting odds of $7,500 to $1,500. There was little doubt at the track that day that one-tenth of an inch had fallen. An hour before the time announced for the start, the heavens twice opened and remained with full water power turned on for a quarter of an hour each time. Then the sun peeped out in a half-hearted, dubious sort of way, yet promisingly enough to jolly several hundred automobiles and several thousand enthusiastic foot, trolley and 'bus passengers to start for the course.

Arrived at Elkwood Park, it really did not look so bad or impossible for racing after all. To be sure, there were little lakes of mud amid slimy stretches of mingled oil and water. A postponement of an hour was announced to permit the track to dry out, and this helped matters considerably. It had been well rolled and soon was in fairly good racing shape, as the times will show.

Elliott Rests His American 10-mile Handicap Winner.

As the afternoon wore on and the weather clerk kept the rain in fairly good check, barring several showers not too heavy to scare an enthusiast, the crowd grew in numbers until the seats on the little grandstand at $2 per were all taken, the tiny bleachers were entirely filled, and several thousand railbirds lined the fence. On the lawns at either side of the stand close to half a hun-

Officials Confer on Postponement After a Heavy Shower.

dred cars were parked at $10 each, scores of automobiles were in the open field near the clubhouse at the head of the stretch, and as many more were drawn up along the fence on the backstretch. Conservatively estimating, there were 300 cars and 5,000 people on hand. With good weather both of these figures would undoubtedly have been doubled. The Jersey coast, be it remarked, is one of the biggest automobiling centers in the country in summer, and its hot-weather colonists are accordingly in an excellent position to command every facility for the holding of an event of this character, even including long-since abandoned horse racing tracks as a venue for a meet.

The races all had good sized fields of really fast cars and the contests were hard and closely fought. It was mean that that cantankerous Jupiter Pluvius had such a grouch on. The management and the sport put up deserved better treatment at his hands.

The outcome, however, was encouraging enough to make it pretty sure that the Fourth of July meet at Elkwood Park will hereafter have a permanent place on the racing calendar.

Two accidents of the bone-breaking variety marred the meet. Both occurred in the 50-mile race. The first one was when an Autocar, driven by C. E. Fisher, and a Stearns, piloted by Arthur Warren, came into collision in rounding the south turn. The Stearns was overturned, throwing out the crew. Warren had his collar bone and three ribs broken, and James Crawford, his mechanic, had his leg so badly crushed that it has to be amputated below the knee. A few minutes later M. R. Guggenheim's Renault, driven by Al. Bellows, lost a tire and dashed through the fence. Henry Myer, the mechanic, evolved with a broken leg. The pitching of a hospital tent in the infield and the conspicuous presence of an ambulance had not been a useless precaution

A five-mile race for stripped cars or stock chassis for a silver cup and a purse of $50 was the curtain raiser. It had for starters a promising quintette, made up of Al. Poole, Isotta; Arthur Warren, Stearns six-cylinder; Ralph De Palma, Allen-Kingston, and Al. Bellows, driving M. R. Guggenheim's Renault. The Allen-Kingston took the lead during the first mile, followed by the American and the Stearns in order. De Palma was never headed. Drawing gradually away, he finally won by a hundred yards from Elliott, who beat Warren the same distance. The fractional times of the winners were: 1 mile, 1:13; 2 miles, 2:16 2-5; 3 miles, 3:19 2-5; 4 miles, 4:23 1-5; 5 miles, 5:25 4-5; Elliott, 5:31 2-5; Warren, 5:38 2-5.

The Isotta was practically left at the post, though starting its motor and later lost its right rear tire and was stopped by Dr. J. R. Overpeck, of Philadelphia, the referee.

Then came the ten-mile race for fully equipped touring cars or runabouts manned by simon-pure amateurs under the A. A. A. rules as follows: W. B. Anderson, 50-horsepower Welch; James Doig, 30-horsepower Stearns; Thomas J. Scully, 30-horsepower Packard, and Stewart Elliott, 50-horsepower American. It was a rattling good race between Elliott and Doig with Scully in warm pursuit and Anderson in fourth place. For two miles less than a hundred feet separated the leaders. Then the big powered American drew gradually away and finally won by 300 yards in 10:53, with the Stearns second in 11:07 2-5, and the Packard third in 11:42 3-5.

Elliott's times by miles were:

1	mile	1:16	6	miles	6:35 2-5
2	"	2:20	7	"	7:38 2-5
3	"	3:24	8	"	8:43 2-5
4	"	4:27 3-5	9	"	9:47 2-5
5	"	5:31 1-5	10	"	10:53

Long-distance races were made prominent features of the card and began with the 50 miles, in which the following lined up: Al. Bellows, Renault; Harry Michener, Lozier; Arthur Warren, Stearns; C. E. Fisher, Autocar; Ralph De Palma, Allen-Kingston; Stewart Elliott, American, and W. B. Anderson, Welch. For the first nine miles there was a rattling good scrap between the American and the Allen-Kingston, with an interesting see-saw struggle also in progress between the pursuing pair, the Lozier and the Renault. Elliott held the lead for five miles and was then passed by De Palma. The American in the tenth mile was stopped by some ignition trouble and lost its place as runner up to the Allen-Kingston, which from here on was never headed, winning in 55:59 3-5, a new record for the track by 6 2-5 seconds. The Lozier was second with 47 miles, and W. B. Anderson's Welch, which was driven by C. Frewin, third, with 44 miles. The

Cars Getting into Action at the Start of the 5-mile Event.

Autocar, Renault and Stearns had been put out of the running by the accidents recited above. The intermediate times were:

Miles.	Leader.	Time.
5	Elliott	5:49
10	De Palma	11:25
15	De Palma	16:47
20	De Palma	22:00 4-5
25	De Palma	27:46
30	De Palma	33:17 1-5
35	De Palma	39:00 2-5
40	De Palma	44:41 1-5
45	De Palma	50:45
50	De Palma	55:59 3-5

Two drivers essayed to beat the mile track record of 53 seconds put up by the late Emanuel Cedrino, in the Fiat, on the occasion of bis racing début in this country in 1903. M. J. Seymour was first away in the Christie, but could do no better on such a soft track—there had been more showers—than :57 1-5. Ralpb De Palma in the Allen-Kingston scored 61 2-5 seconds.

A speedy octette of long-distance track performers faced the starter for the 100-mile race, which concluded the racing. They were: Al. Poole, 60-horsepower Isotta; Harry Michener, 45-horsepower Lozier; J. Price, 45-horsepower Acme; Stewart Elliott, 50-horsepower American; Ralph De Palma, 40-horsepower Allen-Kingston; Felix Prossen, 40-horsepower Bianchi; Ed. Von Kathergill, 50-horsepower Pope-Toledo, and I. M. Appercu, 20-40-horsepower Cadillac. The struggle that ensued was a hard-fought battle with varying leadership that kept the interest and enthusiasm of the spectators keyed

Lozier Makes Change of Tire in One Minute.

up from start to finish. It was besides a game all around exhibition of perseverence and pluck on the part of the drivers, for before the race was one-third over the rain again began to fall and made a skating rink of the course. The cars skidded badly at the turns and often swayed from side to side in the stretches. In fact, the going was so bad that there were calls to the referee to declare the race off. Dr. Overpeck, however, refused, pronouncing the course safe for long-distance racing and declaring that the contestants had a right to a run for their entrance fees.

Elliott went away in the lead and held it for ten miles, when De Palma, who had been pursuing him hotly, took it from him. The contest soon split up into a triangular duel of three pairs of cars, the Allen-Kingston and the American fighting for the lead, the Lozier and the Isotta alternating ahead of one another, and the Acme and the Bianchi having a merry scrap further back.

Around the 35th mile Poole stopped for goggles and then began chasing the flying leaders in earnest. Within five miles he had caught and passed De Palma. Elliott had dropped out in the 29th mile. The former bicycle racer, however, would not be shaken off and hung on tooth and nail. Mile after mile the pair wig-wagged in the mud by the cheering stand. Closer and closer the Yankee car crept up on the Italian machine and finally got by it in the 80th mile. Then Poole woke up and cut loose with the Isotta and caught and passed the Allen-Kingston. Both took desperate chances in the mud. But the Savannah and Briar-

Picturesque Finish by the Stearns in 10-mile.

cliff winning brand was too fleet for the Allen-Kingston, well and courageously as it was driven, and, drawing gradually away, finally won by the length of the stretch in 2 hours 10 minutes 36 4-5 seconds. The Allen-Kingston was beaten by but 12 seconds. The Lozier was third with 93 miles, the Bianchi fourth with 88 miles, Acme fifth, 82 miles, Cadillac sixth, 77 miles, Pope-Toledo, seventh, 70 miles. The score was:

Miles.	Leader.	Time.
10	Elliott	10:34 2-5
20	De Palma	23:11 2-5
30	De Palma	36:03
40	Poole	50:06
50	Poole	65:54 3-5
60	Poole	79:54
70	Poole	93:07 2-5
80	De Palma	106:03
90	Poole	118:20 2-5
100	Poole	130:26 4-5

It may be of interest to watchers of the success of the various makes of tires to note that Michelins were first and second in the 100 and first in the 50-mile race. After the races the drivers and scribes were given a clambake at Price's, Pleasure Bay.

ROCKVILLE CLUB HOLDS SUCCESSFUL CLIMB.

Rockville, Conn., July 2.—The Automobile Club of Rockville is to be congratulated on the success which attended the holding of its first hill-climb. The course measures 7-10-mile and is a stiff grade, which had been prepared by sprinkling with calcium chloride solution. Robinson in the Stevens-Duryea six and Bourgue in the Knox were the stars of the day in the large car class, while the Ford runabout took honors in its class. The Stevens-Duryea's record of :41 flat in the final was not approached, the Knox and Thomas-Detroit times of :50 and :50 1-5, respectively, made in Event 5, coming closest to it, the Knox also doing the hill in :50 flat in Event 6. In the latter, J. W. Swan in the Corbin was a good third in :50 2-5, a Stevens-Duryea taking this event in :43 1-5.

Where the Guggenheim Renault Turned Itself Over.

WILDWOOD AUTOISTS CELEBRATE THE FOURTH

WILDWOOD-BY-THE-SEA, N. J., July 6.—A battle royal between the Chadwick and the Fiat was the feature of Saturday afternoon's sprints over the famous Central avenue mile straightaway speedway, and the result proved a hard-earned victory for the foreigner, its 120 horsepower proving too much of a handicap for the 50 horsepower of the Pennsylvania designed car. Paul Schill and Willie Haupt were the drivers, and each exerted every ounce of strength and technical wisdom to land his car in the lead. Under the circumstances the result is a practical triumph for Haupt and the Chadwick, for, despite the disparity in power, each of the three trials of the latter in the official time trials was slower by but 2-5 of a second than those of his 40 per cent. more powerful rival. The Fiat's times were :45 2-5, :44 3-5 and :42 3-5, while the Chadwick's trials were made in :45 4-5, :43 4-5 and :43 2-5. The Fiat's best time not alone broke the best previous gasoline figures—Monte Robert's :44 flat—but was also two-fifths of a second under the course record of :43 flat made last Labor Day by Bert Holland in a Stanley steamer. Haupt twice succeeded in besting the 1907 gasoline record, while Schill was also able to do the trick but once. The Fiat's average for its three official time trial trips was :44 3-15, as against the Chadwick's :44 5-15. Haupt claims that he can beat :42 flat over the course, and would have done so had not some gravel found its way into his gearcase and interfered with the prompt shifting of his gears.

There was something of a mix-up in the $2,001 to $3,000 class when Frank Lescault, driver of the P. & S. car, protested all the other cars in the event for the reason that they were not equipped with fenders, as per catalogue—the program calling for catalogue equipment. After a consultation the officials refused to entertain his protest, whereupon Lescault left the course, withdrawing his car from all the other events in which it was entered and departing immediately for New York. It later developed that the P. & S. had made faster time than any of its competitors in the event, and as the prize was "up in the air," the event was run again as a special, when W. Mullen's Thomas "Forty" bested the Pennsylvania "Thirty" and the Apperson "24-30" with a mile in 1:02 flat.

Besides the Fiat-Chadwick duel, the time trials were rendered interesting by the excellent performances of the Chalmers-Detroit, which covered the course in :51 2-5; of the Apperson, driven by "Charlie" Swain, ex-president of the Quaker City Motor Club, who, despite the fact that he was the only "pure" driver in the official time trials, took his car to the wire in :52 2-5; and of the Parkin "40," a comparative newcomer, which went two trips in :55 3-5 and :53 respectively, with young "Joe" Parkin, son of the builder, at the wheel. Eddie Wilkie, with his 18-horsepower Buick, negotiated the course in 1:13 3-5, equaling the time made in the trials by the Cleveland "40." Wilkie had previously captured the under $1,250 class for gasoline with the same car in 1:28 1-5, excelling the time of the winning Mitchell in the $1,251 to $2,000 class by nearly five seconds.

Mullen and Magraw, in Thomas "40's," and W. Sprankle in a "45" Premier, battled for the honors in the $3,001 to $4,000 class; the Thomases finished one-two, Mullen winning in 1:04 2-5.

Schill and the monster Fiat easily registered in the four-cylinder over $4,000 class, with a mile in :53 1-5, "Charlie" Swain being unable to do better than 1:01 2-5, owing to a cylinder missing. Had he done as well as he did later in the time trials, :52 2-5, he would have had the satisfaction of collaring a cup from Schill. The latter also easily annexed the free-for-all, Haupt being unable to get his Chadwick to the tape owing to ignition trouble. Schill for the first time let the Fiat out, getting under the :50 mark. His time was :49 4-5, and Joe Parkin, who finished second, could do no better than :58 4-5.

The course was in excellent shape and was kept clear at all times with the assistance of the Ninth Philadelphia Boys' Brigade, under Clement M. Devine. An early morning rain, which promised to spoil the sport, had the effect of packing down the surface and laying the dust. The summary:

GASOLINE CARS, UNDER $1,250.

1.	Buick	18	Eddie Wilkie	1:28 1-5
2.	Mitchell	20	W. M. Cram	1:28 2-5

GASOLINE CARS, $1,251 TO $2,000.

1.	Mitchell	35	W. M. Cram	1:33
2.	Overland	24	W. H. Ford	1:35 4-5

GASOLINE CARS, $2,000 TO $3,000.

1.	Palmer & Singer	45	Frank Lescault	1:13 1-5
2.	Pennsylvania	30	Len Zengle	
3.	Apperson	24-30	George L. Davis	

GASOLINE CARS, $3,001 TO $4,000.

1.	Thomas	40	W. Mullen	1:04 2-5
2.	Thomas	40	W. Magraw	
3.	Premier	45	W. J. Sprankle	

FOUR-CYLINDER CARS OVER $4,000.

1.	Fiat	120	Paul Schill	:53 1-5
2.	Apperson	48	Charles J. Swain	1:01 2-5
3.	Stearns	50	H. Goodin	

SIX-CYLINDER GASOLINE CARS.

1.	Chadwick	80	F. J. Nordell	1:00
2.	Parkin	40	J. W. Parkin, Jr.	1:00 1-5

FREE-FOR-ALL.

1.	Fiat	120	Paul Schill	:49 4-5
2.	Parkin	40	J. W. Parkin, Jr.	:58 4-5
3.	Chalmers-Detroit	40	W. J. Brown	

SPECIAL FOR GASOLINE CARS, $2,000 TO $3,000.

1.	Thomas	40	W. Mullen	1:02
2.	Pennsylvania	30	Len Zengle	
3.	Apperson	24-30	Geo. E. Davis	

TIME TRIALS, OPEN TO ALL CARS.

1.	Fiat	120	Paul Schill	:44 3-5
				:45 2-5
				:42 3-5
2.	Chadwick	50	Willie Haupt	:45 4-5
				:43 4-5
				:43 2-5
3.	Chalmers-Detroit	40	W. J. Brown	:51 2-5
4.	Apperson	48	C. J. Swain	:52 2-5
5.	Parkin	40	J. W. Parkin, Jr.	:55 3-5
				:53
6.	Thomas	40	W. Magraw	1:01 1-5
7.	Apperson	24-30	Geo. E. Davis	1:06 3-5
8.	Buick	18	E. Wilkie	1:13 3-5
9.	Cleveland	40	W. A. Wood	1:13 3-5

The carnival wound up Saturday night with the presentation of medals and prizes at the big band stand on the boardwalk. Paul Schill, besides his other prizes, was given a handsome gold medal for driving the car that lowered the course record.

Friday's reliability run from Philadelphia was marred somewhat by the combined antics of J. Pluvius and the constables at Magnolia. The former, however, acted quite decently as compared with the latter. He let up now and then; the constables never. About forty cars left the Jersey side of the Delaware for this place. At Magnolia, about six miles from the start, a pair of constables were "on the job." Each driver was asked to show his license card and certificate, and the unlucky wight who had neglected to provide himself with credentials was compelled to turn his car around and go home. In this way over a dozen cars were eliminated from the run, and their occupants were naturally furious. So were the hotel keepers here when they heard of the hold-up. But 24 cars arrived at the finish, and of these 14 were adjudged by the officials as clean-scorers. The handsome cup hung up by the Wildwood Club was drawn for and won by J. M. Hendricks, owner of a Chadwick.

After the run on Friday night all the cars were hurriedly cleaned up and, with the addition of quite a number of cars of visitors and residents, were placed on exhibition on the boardwalk. The display was very creditable both as regards number and quality, the cars extending along the esplanade for quite a distance. Attendants were stationed at most of the cars, and the novelty of a one-night outdoor automobile show was voted a huge success by the thousands of holiday visitors.

The parade on the morning of the 4th was a huge success.

Germany Triumphant in Grand Prix

HOW THE DRIVERS FINISHED IN THEIR LONG RACE ON THE DIEPPE CIRCUIT.

Pos.	Car.	Nation.	Driver.	Time. H. M. S.
1.	MERCEDES	Germany	Lautenschlager	6 55 43
2.	BENZ	Germany	Hemery	7 04 24
3.	BENZ	Germany	Hanriot	7 05 13
4.	BAYARD-CLEMENT	France	Rigal	7 30 36
5.	MERCEDES	Germany	Poegge	7 32 31
6.	OPEL	Germany	Joerns	7 39 40
7.	BENZ	Germany	Erle	7 43 21
8.	RENAULT	France	Dimitriewitch	7 52 12
9.	PANHARD	France	Heath	7 55 38
10.	GERMAIN	Belgium	Perpere	7 59 08
11.	ITALA	Italy	Cagno	8 07 56
12.	BAYARD-CLEMENT	France	Gabriel	8 11 44
13.	MOTOBLOC	France	Courtade	8 12 43
14.	MOTOBLOC	France	Gerest	8 19 58
15.	RENAULT	France	Callois	8 19 57
18.	MORS	France	Jenatzy	8 24 44
17.	MORS	France	Jarrott	8 39 20
18.	AUSTIN	England	Brabazan	8 42 50
19.	AUSTIN	England	Resta	8 46 50
20.	ITALA	Italy	Fournier	8 47 20
21.	OPEL	Germany	Opel	9 08 11
22.	GERMAIN	Belgium	Degrais	9 13 34
23.	PANHARD	France	Farman	9 24 40

DIEPPE, July 6.—All the high honors in the Grand Prix, which was run over the Dieppe course to-day, fell to Germany. Her triumph was as complete as was ever attained by a nation in this classic international contest. Her cars finished one, two, three. It was a bitter day for French and Italian makers, who in the past years have pretty well monopolized Grand Prix honors. Frenchmen, however, were at the wheels of the second and third cars.

Lautenschlager, driving a Mercedes, won. He covered the 478.1-mile course in 6 h. 55 m. 43 s., an average of 111.5 kilometers, or 69.24 miles per hour.

Hemery, a Frenchman, and former Vanderbilt Cup winner, was second in a Benz, a German car, in 7 h. 4 m. 24 s.

Hanriot, another Frenchman, also driving a Benz, was third, in 7 h. 5 m. and 13 s., less than a minute behind Hemery.

Louis Strang, before the start, drove up to the enclosure with the transmission and reversing gear of the Thomas, the only American car competing, so jammed as to kill all chance this stock car had before the race was even started. Strang and his mechanic managed to mend matters a bit, but was forced to start with the first and second speed and the reversing gear out of commission. Despite this, he completed the first round of 47.8 miles in 53 m. 44 s., and, after more repairs, resumed the race. He made the second lap in 63:43, the third in 56:47, and the fourth in 58:01. This was as far as he got. He said he had tire troubles every round, and that finally one cylinder was put entirely out of commission.

The killing of two men was the one cloud on the success of the race. As Cissac was on the final round with a Panhard, a tire was torn off, resulting in the car upsetting and crushing to death its driver and his mechanic, Schaub.

Another serious accident was the upsetting of a Weigel in rounding a turn near Eu. Harrison, its driver, was thrown out and carried to a hospital tent, badly injured.

A feature of the race was the pluck displayed by Hemery in continuing the contest after a flying stone had driven a piece of glass from his goggles into his eye. The game Frenchman drove up to the stand, stopped only long enough for a physician to inject cocaine in the injured member, and then went on without losing his place as runner up.

The pace at the start was very fast. Salzer, driving a Mercedes, made the first round in 36 m. 31 s., or at the rate of 126.5 kilometers an hour. This was the fastest lap in the race, and beat the 38 m. 16 s. made my Nazarro last year. In fact, six drivers beat the Fiat crack's record in the first round. The winner's time at the end, however, was 9 minutes slower than Nazzaro's winning time in 1907.

Lautenschlager took the lead in the seventh round by steady driving, and after that was never headed. After five rounds had been completed, the three German cars had attained the positions in which they finally finished. After the Mercedes champion had wrested the lead from Nazarro, the Fiat crack dropped back into the ruck. His downfall was due to a jammed clutch. Nazarro had fought his way to the fore in the second round.

The French fought fiercely to avoid defeat. Szisz, the Renault crack, fell back, and then Duray, the blonde Lorraine pilot, dropped behind. This left the brunt of the fight to Théry, the champion of the Gordon-Bennett days. He, too, was finally passed in the fourth round by his compatriots, Hemery and Hanriot, at the wheels of German cars. Tire trouble was at the bottom of his fall.

The Frenchmen, though bitterly disappointed at the outcome, took their medicine with admirable sportsmanship. Lautenschlager was loudly cheered as he was escorted to the presidential box, where he was congratulated by M. Maujan, minister of the interior, while the band played "Wacht am Rhein." Baron von Zuylen, president of the Automobile Club of France, telegraphed Emperor William, announcing the success of the German cars.

The result of the race was a repetition of the Michelin success of the voiturette race the day before, the entire trio of German cars, which finished in the lead, being equipped with Michelin tires.

A. A. A. DELEGATES ARE DENIED ADMISSION AT DIEPPE

ACCORDING to press cables, the allied European clubs, which met at Dieppe on Monday, denied the national body of the United States admission, a personal hearing and voted to recognize the Automobile Club of America as their sole representative in this country. William K. Vanderbilt, Jr., and A. G. Batchelder, the accredited representatives of the American Automobile Association, were not allowed to be present. Count Sierstopff, president of the German Automobile Club, is reported to have made a statement on their behalf setting forth as best he could from hearsay the conditions existing in this country. There was no opportunity afforded Messrs. Vanderbilt and Batchelder to reply to any statements Dave Hennen Morris, George Heath, and W. S. Hogan, the club delegates, might make.

Count Sierstopff is said to have pointed out that the A. A. A. was the larger and more powerful organization and that the Vanderbilt commission had never been notified of any agreement made by its correspondents in the matter of the Ostend rules. As a matter of fact, the New York club's foreign representatives, then acting as A. A. A. correspondents, never attended the Ostend meeting and so could not have bound the A. A. A. to the revised rules had they had any such authority.

The shutting out of the A. A. A. delegates and the refusal to grant the national body in the United States a hearing was the outcome of a protest filed by the national clubs of Great Britain and Germany prior to the meeting.

The cables say the discussion was a warm one and resulted in the recognition of the New York club as the only organization in this country that could hold membership in the International Association of Recognized Automobile Clubs. The position taken was that only one organization could be recognized in any one country and that the choice should fall on the one that had incorporated the Ostend conditions in its rules.

A clever grandstand play was made by the New York club in Judge Gary securing from President Roosevelt, our nation's good-natured chief, a message of good will for transmission to Baron Zuylen von Neyvelt, the president of the association. The color this message lent to the pretensions of the New York club to being a national body can well be imagined.

The outcome will draw the line between the A. A. A.'s contest and the New York club's races still more sharply. The Vanderbilt will have its Americanism intensified and the Savannah will be more than ever emphasized as a special event kindly promoted in this country for European cars under European rules by their very good friends of the New York club.

FRENCH VOITURETTES ARE VICTORIOUS.

DIEPPE, July 6.—France prevailed signally in the race to-day for voiturettes over the Dieppe course, which scored as a curtain raiser to the Grand Prix of to-morrow. The first five cars to finish were of French make.

A double cylinder Delage, driven by Guyot, won, his time being 5 h. 45 m. 30 s., an average of 50 1-3 miles per hour. A single cylinder Sizaire et Naudin, piloted by M. Naudin, was second in 5 h. 52 m. 6 s. Leon-Peugeot single-cylinder cars, driven respectively by Goux and Dugernoy, finished third and fourth, the first being four minutes behind Naudin. Thomas, driving a Delage, captured fifth place. All were fitted with Michelin tires.

There were 62 entries and 47 starters, of whom 32 finished, including 8 complete teams. There were 40 French, 3 Italian, and 3 Swiss cars in the race.

The attendance was conspicuously small at the start—less than one thousand were seated on the monster grandstand. The course was in bad shape and was further cut up by the racers, so that to-morrow's Grand Prix contestants will probably have rough going with the likelihood of much tire trouble.

There were a few accidents, none, however, of a serious character. A Truffault, driven by DeMeester, struck a bridge at Eu. A Guillenim, piloted by Bordes, overturned at Maux. Anaries, with St. Marc in the seat, broke a wheel. None of the drivers were badly injured in any of the spills.

ZEPPELIN AIRSHIP PROVES DISAPPOINTING.

FRIEDRICHSHAFEN, GERMANY, June 30.—Count Zeppelin's monster airship has sorely disappointed its backers. After considerable delay, caused by mechanical defects discovered at the last moment, the airship made preliminary flights over Lake Constance, but altogether failed to live up to expectations.

The driving fans, operated by two 126-horsepower motors, appeared to be no larger than those of the earlier No. 3, and were manifestly unable to drive the balloon at anything like the speed required. There was also a lack of buoyancy.

It is declared on good authority that the German Government officials who have been backing Count Zeppelin are bitterly disappointed at the failure of the airship, and that as the result of non-success support is likely to be withdrawn.

OVAL TRACK FOR WINNIPEG.

WINNIPEG, MAN., July 2.—A movement is afoot to construct a 158-mile road for automobilists near Winnipeg. It will be oval in form, and the expense of the construction and maintenance will be met from the tolls collected from those who use it. It is proposed to run some big races on the road, which will be oiled to keep down the dust. Eastern Canada has already taken kindly to oiled roads. This is demontrated in Montreal, where the practice of oiling the roads is being freely adopted.

RACES AT FAMOUS PIMLICO TRACK WERE EXCITING

BALTIMORE, July 6.—Robert Morton, who drove the 40-horsepower Pullman car entered by the York Motor Car Company, of York, Pa., was the real hero in the third automobile races held at Pimlico, on the Fourth of July, under the auspices of the Motor Car Racing Association of Maryland. Of the four events in which this Pullman car was entered, Morton captured three firsts and was third in the other. He defeated E. L. Leinbach, the "Daring Dutchman," in the five-mile stock touring event, his time in this race being 6:06. Leinbach drove in this event a 35-horsepower Moon car, entered by William C. Blome, of Baltimore. Morton was also first in the ten-mile free-for-all handicap and in the 50-mile championship, open to stripped stock chassis of 45-horsepower or less.

Morton in Pullman Winning 10-mile Handicap.

Leinbach was a close second in the distribution of honors. With his 60-horsepower Stearns car, he won the ten-mile Maryland runabout championship, for stock touring runabouts or tourabouts, and was third in the ten-mile handicap, the only two events in which this car was entered. He only lost the handicap race to Morton and Roy Stains, who also drove a Pullman car, of 30-horsepower, because of the handicap he gave these cars. Morton had 35 seconds and Stains 50 seconds. Morton's time, including the handicap, was 10:36, while Stains's time was 10:47. Leinbach made the distance in 10:52 from scratch. This race was the center of interest and while Leinbach crossed the line third he made the best time. One of his miles was made in 1:03 3-5, while his average for the ten miles was 1:05 1-5.

The 50-mile championship proved a dual event—two races in one. The two Pullman cars, driven by Morton and Stains, were neck and neck in the lead until Stains's car, near the approach of the 28th mile, went wrong. In the meantime the two Autocars, driven by John Archfield and J. F. Brown, had an interesting race all to themselves further back. Morton won the event and Archfield came second, with A. W. Behrens, in a 28-horsepower Maryland car, third.

The opening event, a five-mile race for baby runabouts, was won by Robert F. Kaehler, in a 15-horsepower Ford. The only accident occurred in the motorcycle event when Chic Thomas went through the fence. W. E. Mangold won this event.

The crowd was disappointed by the non-appearance of the entries of Louis J. Bergdoll, of Philadelphia, the millionaire driver, who was scheduled to meet Leinbach in a 25-mile match race. The failure of the cars to be at the track will result in Starter Wagner reporting them to the racing board, which may result in suspension. The cars of J. L. B. Wilhide, of Baltimore, and Thomas and Tolman of Washington, will also be reported.

Starter Wagner would not allow the 40-horsepower Thomas, entered by Wallace Hood, of Washington, to start in the Maryland runabout championship because of an extra tank being on the car. Hood was also entered in the 50-mile race, but had trouble with his cylinder, which he could not put in shape.

H. M. Rowe was referee. The judges were Osborne I. Yellott, W. S. Belding and James S. Reese; starter and clerk of the course, Fred J. Wagner; assistant starter, Edgar F. Dobson; announcer, Howard A. French; scorers, E. C. Briggeman, L. W. Tremblay and R. Milton Norris; timers, C. Howard Millikin, Harry F. Fisher and C. Ross Klosterman. The summaries:

FIVE MILES—BABY RUNABOUT CLASS; OPEN TO RUNABOUTS COSTING $1,250 AND UNDER.

1.	Ford	15	R. F. Kaehler		6:59
2.	Cameron	16	Jefferson Davis		7:13
3.	Overland	20	Geo. E. Norwood		....

TEN MILES—MARYLAND RUNABOUT CHAMPIONSHIP; OPEN TO STOCK TOURING RUNABOUTS OR TOURABOUTS.

1.	Stearns	60	E. L. Leinbach		11:04 2-5
2.	Pullman	30	Roy Stains		11:33
3.	Pullman	40	Robert Morton		11:39
4.	Autocar	30	J. F. Brown		.....
5.	Autocar	30	E. H. Freas		.....
6.	Autocar	40	Chester Smith		.....

FIVE MILES—OPEN TO STOCK TOURING CARS OF 24.1 TO 40-HORSEPOWER, INCLUSIVE.

1.	Pullman	40	Robert Morton		6:06
2.	Moon	35	E. L. Leinbach		6:56 3-5

TEN MILES—PIMLICO FREE-FOR-ALL HANDICAP

1.	Pullman	40	Robert Morton		27:08
2.	Pullman	30	Roy Stains	(60)	10:47
3.	Stearns	60	E. L. Leinbach (Scratch)		10:52
			Also Started.		
	Maryland	28	A. Behrens	(1:10)	.....
	Jackson	40	C. Smith	(:55)	.....
	Autocar	30	E. H. Freas	(:55)	.....
	Autocar	30	J. E. Brown	(:50)	.....
	Thomas	40	W. C. Hood	(:10)	.....

FIVE-MILE MOTORCYCLE CHAMPIONSHIP PISTON DISPLACEMENT HANDICAP.

1.	Indian	3 1-2	M. E. Mangold	(20)	5:49
2.	Indian	3 1-2	Chic Thomas	(20)	5:55
3.	Indian	3 1-2	W. S. Fisher	(30)	.....

FIFTY-MILE CHAMPIONSHIP—OPEN TO STRIPPED STOCK CARS OR STOCK CHASSIS OF 45-H.P. AND UNDER.

1.	Pullman	40	Robert Morton		57:08
2.	Autocar	30	John Archfield		62:22
3.	Maryland	28	A. W. Behrens		66:18
4.	Autocar	30	J. F. Brown		66:47
5.	Pullman	30	Roy Stains		.....

Start of Runabout Championship That Stearns Won.

TIME OF WINNER BY MILES.

Miles.	Time.
5	5:47
10	11:20
15	16:55
20	22:30 2-5
25	28:02
30	33:35
35	39:17
40	45:07
45	51:02
50	57:08

F. A. M. MEET BRINGS OUT NEW MILE RECORD

NEW YORK, July 6.—For the past three days the Federation of American Motorcyclists has had possession of the town. Friday, July 3, was set as the day for the opening of the annual reunion, which took the form of a business meeting and election held at Terrace Garden. The officers who will serve for the ensuing year are: president, Earle L. Ovington, New York; vice-president, eastern district, E. L. Buffington, Providence, R. I.; vice-president, southern district, E. Y. White, San Antonio, Tex.; vice-president, western district, John R. Ball, Milwaukee; vice-president, Pacific Coast district, R. K. Holmes, Los Angeles, Cal.; treasurer, E. B. Gibson, Westboro, Mass.; secretary, H. J. Wehman, New York.

On the following day, the members and their friends, several thousand strong, gathered at the new Clifton Stadium in Paterson, N. J., for the annual race meet which proved to be a highly exciting event. The star performer of the day was J. H. DeRosier, of Springfield, Mass., who lowered the world's motorcycle mile track record of :56 2-5 seconds, made by C. Hoyt of Cambridge, Mass., in 1905, to :56 flat. DeRosier, mounted on a 5-horsepower, twin-cylinder Indian machine, made his first appearance in the 10-mile race for professionals, limited to machines not exceeding 61 cubic inches piston displacement. He got away easily and led the bunch for the entire distance, his machine making lap after lap of the steep-banked track with that steady purr that indicates perfection of running. He made the distance in 11 minutes, 59 seconds, J. King of Newark, N. J., coming in second shortly after.

The next event on the program was DeRosier's mile exhibition against time, and was made from a flying start. His terrific speed of considerably better than a mile a minute was appalling on the small saucer-like track, which has six laps to the mile, the impression received by the spectators being that of a flying human ball from which flames and smoke leaped in a steady stream, as the motor was kept opened to such an extent, even on the curves, that the exhaust was nothing but an uninterrupted roar right from the start to the finish.

The comparison made by the next event on the program, which was a half-mile race for tricycles, brought a laugh from the spectators, owing to their snail-like pace. The best time was made by F. W. Jones of Passaic, who led Oscar Goerke of Brooklyn, over the tape by a tire in :57 4-5. In the five-mile pursuit race limited to machines not exceeding 61 cubic inches piston displacement, Charles Davidson, of Springfield, Mass., on a 5-horsepower Indian, overtook Fred Huyck, of Chicago, at the two-mile mark. Preliminary heats in the three-mile pursuit race were cut to a mile, and the two left to contest in the final three-mile trial were Walter Goerke, of Brooklyn, and Charles Gustaveson, of Springfield, Mass. Goerke caught his opponent at exactly the three-mile mark, his time for the distance being 3 minutes, 17 seconds. This event was limited to machines not exceeding 30.50 cubic inches piston displacement. There were two or three bicycle races on the program as well.

The closing event of the annual meet took the form of an 1,100-mile tour from New York to Chicago, 20 contestants leaving the Hotel Empire at Sixty-third street and Broadway Monday morning last. Between six and seven o'clock the same evening, 16 of them had checked in at the Ten Eyck, at Albany, 153 miles, to I. F. Alofsin, who is the tourmaster. The remainder were stretched along the road between Poughkepsie and Albany, their delays being chiefly due to tire troubles. Tuesday's installment consisted of a run of 98 miles to Utica, N. Y., the difference in the distance of the two days being accounted for by the fact that part of the day's run will consist of a hill-climb at Tribes' Hill. This is between Amsterdam and Fonda and is believed to be the worst rise on the entire run to Chicago. Chairman Alofsin has charge of the climb, assisted by E. A. Githens and P. S. Harte. All the riders who arrived at Albany the night before in time to check in got to the hill in good season, with the exception of De Salvo on an Armac, who was penalized 3 1-2 points for being late at Amsterdam. He was also unfortunate on the hill, as he was compelled to dismount about half way up, and in this manner lost another 5 points. With this single exception the much dreaded hill proved to be a tame affair, every one of the machines getting up it without the slightest hitch. Nor have any of the others suffered from road penalizations, although the going has not been quite as good as the first day. The difference in the distance may account for this, and doubtless some of the riders will meet with misfortunes between Utica and Buffalo. Since it was last reported at Poughkeepsie at 5:30 P. M. Monday, the light team of three machines has not been heard of, and it seems quite probable they were unable to continue further, owing to an accident of some kind.

One of the features of the first day's run to Albany was the welcome of the Hudson Valley Automobile Club, at Poughkeepsie, who warned the motorcyclists of speed traps and torn-up roads between that city and Hudson and set them on the right way, furnishing complete directions for finding the good state roads in Dutchess and Columbia counties. The run was marked by but one accident, which happened to Arthur Lyon, of Chicago, who killed a dog while coming up Green street, Albany. Lyon got a severe jolt but was not thrown from his seat or injured in any way. The roads and weather have been ideal and reports received from points further west indicate that favorable conditions are to be looked for as far as Buffalo at any rate. The riders, or at least those of them who manage to survive the gruelling test, expect to arrive in Chicago July 16.

Some of the Huge Crowd That Gathered at Clifton.

Start of One of the Motorcycle Teams for Chicago.

THE STORAGE BATTERY IN AUTOMOBILE WORK

By BRUCE FORD, Member Society of Automobile Engineers.

THE history of the storage battery dates from the year 1860, when a Frenchman named Gaston Planté immersed two pieces of sheet lead in dilute sulphuric acid without touching each other and passed a current from an external source through them; one of these plates became oxidized, and upon reversal of the current the oxidized plate became reduced and the other plate became oxidized. He discovered that upon breaking the circuit the lead plates had become charged and would act like a primary battery in giving current, the oxidized plate being the positive and the reduced plate the negative pole. He further discovered that by reversing the current several times the capacity of the cell was considerably increased by reason of the fact that the layer of oxide would become thicker upon each reversal, and that this oxide becoming reduced would give a layer of spongy lead, thereby increasing the capacity of both the positive and the negative plate. In 1880 another Frenchman named Camille Faure and an American named Charles F. Brush, almost simultaneously brought out plates in which the chemical actions employed were the same, but instead of forming the layer of oxide from the metallic body of the plates by the reversals of current, the oxide was mechanically applied to frames of lead or lead alloy. By this process the same, or greater capacity, could be obtained from plates of less weight.

Plates of the former type, although very much modified in design over those of Planté, are to-day extensively used in stationary work, and to some extent in portable work. They are also used to a very limited extent in automobile work; but the plate almost universally used in this class of service is of the Faure or Brush type, and this paper will be devoted to this type alone. The earliest commercial application of the storage battery for automobile propulsion was made with the chloride accumulator, a battery of modified Planté type, and in 1899 its makers, foreseeing the need of a lighter and more compact type of battery, started to develop one of the Faure or Brush type. The result was the battery since known as the "Exide." The makers have kept in close touch with the requirements of service, and not only have the positive and the negative plates been modified from time to time, but the jars and accessories and methods of mounting and connecting the cells have been improved just as the vehicle itself has been improved, as the requirements have become better understood.

The storage battery finds itself used in various ways in an automobile. In the electric machine it is the entire source of the energy used for propulsion. In the gasoline-driven machine it makes a convenient and reliable source of ignition. These two form by far the largest uses, although, in the case of the combination gasoline-electric machine the storage battery is useful as a reservoir of power to be called upon in emergency conditions, enabling the power plant to be of size more in proportion to the average rather than to the maximum demand. In this system the storage battery is also very useful in starting the engine. The storage battery is also used to some extent for lighting automobiles, and in some cases the ignition battery of a gasoline machine is made of specially high capacity, so that it can be used for front and rear lights in addition to its function of furnishing current for the spark.

Batteries for Pleasure and Business Service.

As used for propulsion, the battery can be divided into two classes: those used for pleasure vehicles, and those used for commercial delivery wagons and trucks. The type of battery is, in general, the same. In commercial service, however, the batteries run to much larger sizes and, in consequence of this as well as the less resilient spring and tire action, they are of necessity assembled in a more heavy and substantial manner. Propulsion batteries consist of the following elementary parts: positive plates, negative plates, separators, straps, jars, covers, connectors and crates for containing the assembly of cells.

The Exide plate consists of a grid of special elastic lead alloy filled with a paste of lead oxide. In design the positive and negative plates are similar, the positive grid, however, being thicker and heavier than that for the negative plate. The standard grids are 7-32 inch and 3-16 inch thick respectively. The grid consists of a frame around the outside of the plate, having vertical bars throughout the body of the plate spaced about 3-4 inch apart and which extend from its top to its bottom edge. There are horizontal rods of very small cross section flush with the surface of the grid and spaced about 1-4 inch apart on each side of the plate; the rods on one face of the plate are not placed opposite those on the other face but midway between them, or in staggered relation. It is thus seen that the body of the grid contains open spaces about 3-4 inch wide, which extend from the top frame to the bottom frame and are enclosed by the horizontal facial rods; these open spaces are filled with the lead oxide paste, which, when in position, sets like cement in the form of a pencil about 3-4 inch wide, held in its position between the vertical bars and between the facial horizontal rods. The plates, after being pasted and the paste allowed to set, are given an electro-chemical formation, during which the paste or active material of the thicker plates becomes peroxidized, making them positive plates, while the active material of the thinner plates becomes reduced to porous, spongy metallic lead, making them negative plates. Each grid is supplied with a projection or lug at or near one of its upper corners.

The plates are made of different sizes, but the two sizes most used are the *MV*, 8 5-8 inches high by 5 3-4 inches wide, and the *PV*, 8 5-8 inches high by 4 3-4 inches wide. The *MV* is rated at seven ampères per positive plate for four hours, and the *PV* at six ampères for four hours; a sufficient number of plates is assembled in each cell to give the required capacity, and a sufficient number of cells are connected in series to give the required voltage. Each cell consists of a rubber jar, an element and electrolyte. The rubber jar consists of a deep rectangular box of hard rubber, with walls 1-8 inch thick, more or less, according to the size and service. In the bottom of the jar, and made integral with it, are bridges or ribs of height consistent with the service and whose function it is to support the weight of the element and to provide space into which is deposited the sediment thrown off by the plates with wear.

Construction of the Elements.

The element consists of positive and negative plates burned to straps and kept apart by separators interposed between the positive and negative plates. In assembling an element, a negative plate is laid down with a separator on it, then a positive plate, separator, negative plate, and so on. The plates are so placed that all the lugs of the positive plates are on one side and all the lugs of the negative plates are on the other side. A strap, consisting of a flat strip of lead or lead alloy having rectangular openings in it of the same dimensions as the cross-section of the lug of the plates, these openings being spaced to register with the lugs, is then placed over the plate lugs of the positive plates, and a similar strap is placed over the lugs of the negative plates. The lugs are then burned into integral union with the straps. In pleasure vehicle service it is customary to make the plate lugs comparatively short, so that the straps are somewhat below the top of the jar, and a cover consisting of a rectangular piece of hard rubber is placed on top of the straps which are furnished with projections extending through holes in the cover and by which the cells are connected by burned joints. In commercial service the batteries are usually assembled with top straps, and the plate lugs extend above the top of the jar, the strap having

two rows of holes in it, one row being placed over the corresponding row of plate lugs of one cell, and the other row of holes being placed over the plate lugs of opposite polarity in the adjoining cell, and the cell is completed by burning the lugs to the straps, which, in this case, themselves make the connection from cell to cell.

Wood Separators Are Most Efficient.

The separator, which has proved by experience to be the most successful, consists of a piece of wood veneer with parallel grooves about 1-4-inch wide, spaced close together and plowed out of one side, the plain sides being placed directly against the face of the negative plates. A thin sheet of perforated hard rubber is placed against the grooved side of the wood and rests against the face of the positive plate; this perforated rubber performs a double function, in that it protects the wood from the oxidizing action of the positive active material and also tends to restrain the wearing action of the wash of the acid on the active material of the positive plate. The grooves of the wood separator are arranged vertically, and there is thus a number of free channels for circulation of the acid and for the escaping gases liberated during the action of the battery, especially toward the completion of charge. The wood of which the separators are made is given a chemical treatment to remove substances contained in natural wood which would otherwise do great damage to the plates; this is of the greatest importance, as the success of the wood separator depends upon the proper method of treatment, and the thoroughness with which the treatment is applied. An improperly treated wood separator is a menace to the life of the plates.

The cells are filled with electrolyte, which consists of a mixture of pure sulphuric acid and pure water, with a specific gravity of about 1.210. After the battery is fully charged the specific gravity reads about 1.280; the reason for this rise in gravity is that the negative plates before leaving the factory are given a slight sulphating treatment to prevent their oxidation; in giving the battery its initial charge the sulphate is reduced to spongy metallic lead, giving sulphuric acid to the electrolyte, which raises its gravity.

In pleasure vehicle service it is customary to enclose the cells with a tight-fitting rubber cover resting on the plate straps slightly below the top of the jar, and to seal the joints with sealing compound, placing a rubber plug in a hole in the center of the cover for filling cells with water to replace evaporation, the plug being supplied with a small hole for the escape of gases. In commercial service, covers are often dispensed with altogether, as the batteries are usually in service a greater proportion of the time and require filling and inspection much oftener. Where covers are used to prevent splashing, they usually rest on special supports and are seldom sealed. From 40 to 42 is the largest number of cells that it is customary to use, as more than this number cannot be charged in series from a 110-volt lighting circuit, and, without special and inconvenient apparatus, it is bad practice to charge batteries in parallel. In the smaller equipments, where the use of 40 or 42 cells would necessitate cells of very small size, it is common practice to use fewer cells of a larger size in spite of the fact that in charging some of the voltage may be wasted through resistance.

Factors Influencing Battery's Life.

The durability of a battery not only depends upon pure materials and uniformity of methods in manufacture, but also upon the care which it receives in operation. A battery could be ruined in half a dozen discharges by sufficient abuse, whereas, with good treatment the same battery might have run for several hundred discharges. The manufacturers, realizing the importance of this fact, have expended a great deal of time and money in trying to impress upon the users the importance of following a few simple rules; and the instruction books, which are carefully revised and brought up to date from time to time, are worked out with a view to bringing out clearly the necessity for following the rules laid down. One of these instruction books is now in its fifteenth edition. A battery is not like a steam engine or dynamo, which, if neglected, will squeal or groan and refuse to work. There are, however, just as clear evidences of trouble or neglect in the storage battery, if looked for, as there are in an engine or dynamo being run without oil. Voltmeters and hydrometers used in an intelligent manner can be used to determine a battery's condition with remarkable accuracy if properly understood.

The life of a battery with pasted plates is normally limited by life of the active material of the positive plates, which with each charge and discharge become more soft and loose at the surface, gradually washing out. As this washing out depends chiefly upon the number of charges, and, within usual limits, is practically independent of the strength or duration of the discharge current, it may be readily seen that statements of life expressed in time, or total mileage, are apt to be misleading.

Four-hour Capacity Is Standard Rating.

Present practice is to rate batteries on the basis of their 4-hour capacity; for instance, a 9-*PV* cell is rated at 24 ampères for 4 hours, the 11-*MV* cell is rated at 35 ampères for 4 hours. The reason for this is that present practice is to so construct the vehicles that at the average current consumption the vehicle will run for about four hours. Some years ago it was the practice to rate vehicle cells on the basis of their 3-hour capacity. This, however, was when a heavier type of cell was used and the requirements for mileage per discharge were not as great. If a battery will give 40 ampères for 4 hours, or 160 ampère hours, it will not give 160 ampères for one hour; and if discharged at 20 ampères it will give more than 8 hours, or more than 160 ampère hours. This is one reason why greater mileage can be obtained on a charge when the vehicle is run at low speed, although, of course, other factors, such as wind resistance, etc., play their part. Exide batteries with proper use will increase up to from fifteen to twenty-five per cent. more than their rated capacity.

Demands are made from time to time for a battery having a greater capacity for unit of weight. It is an axiom in storage battery work that greater capacity for unit of weight means decreased durability. The simplest way to increase capacity with the same weight is to fill the plates with a more porous paste. This results in a paste which, with use, becomes softened up and washes out more rapidly, and is not considered good practice. The preferable method is to make the plates thinner and put more of them in each cell. A plate of one-half the thickness will not have the same capacity as a plate of standard thickness, but it will have more than half the capacity. This fact, together with the fact of there being more plates per cell, and therefore, at the same current per cell the rate of discharge per plate is lower, makes an appreciably higher ampère-hour capacity per unit of weight. Cells have been made in which the positive plates are 3-16 inch thick and the negative plates 5-32 inch. By placing eleven of these plates in a jar designed for nine standard plates, the weight is increased about 2 per cent., while the capacity is increased about 20 per cent. The life, expressed in number of discharges, is naturally less in the special thin plate combination. If, however, the full capacity is taken out on each discharge, the life in ampère hours, or, in other words, the mileage obtained, would be about the same as with standard plates fully discharged each time.

Light Weight Is Not the Only Factor.

The aim in the design of the Exide cell is to produce the greatest watt output per pound at the 4-hour rate of discharge, consistent with durability. The straps and plate lugs are not only designed with reference to mechanical strength, but also are made of cross-section consistent with drop in voltage, to give the maximum watts per pound at the cell terminals. In the vehicle battery this is a most important feature. There are many cases where the vehicle manufacturers could give advantageous consideration to the drop in conductors. An Exide cell discharging at its 4-hour rate is giving, roughly, two watts per

pound of cell. In ordinary cases the most economical size of wire to use for the conductors would be that which would give a loss per pound nearly equivalent to the output per pound of battery; or a conductor loss of about two watts per pound of wire, since the number of watts per pound should be a maximum at the motor terminals and not only at the battery terminals.

Ignition Accumulators an Important Branch.

There are probably many cases where the addition of a pound to the wire or to the controller contacts would save three watts or more at the motor terminals. It would seem that aluminum is a metal particularly well suited for wiring electric vehicles, since its weight for the same conductivity is much less than that of copper. By using aluminum conductors it would, therefore, be possible to reduce the weight and also to reduce the total loss in conductors both together. Its cost for the same conductivity is about the same, or even a trifle less, than the cost of copper. I have, however, never heard of aluminum being used for this purpose in this class of work.

Storage batteries for the ignition of automobile gas engines have become quite an important development of the storage battery business. For this class of service it is not only necessary to have substantial and durable plates and fittings, but it is necessary that all the parts should be mounted in a compact and durable manner. Batteries for this class of work, at the present time at least, must be built for abuse. They are frequently discharged until practically exhausted, and they are allowed to stand in this condition. No battery worked in this manner can give the best results, and it is economy to take care of the batteries in this class of service just as it is economy to take care of them in other classes of service. The discharges, however, extend over long periods of time and, even when abused, after the battery has given comparatively few discharges it has had a considerable life, measured in time. The Exide battery for this purpose consists usually of three cells, each element composed of plates, usually 5 inches high and 4 3-4 inches wide, mounted in a rubber jar with wood separators, and having posts extending through the cover of the jar. The inter-cell connections are burned and the posts are extended and terminate in a bolt and nut connection for the ignition. The bolts were formerly made integral with the posts, but owing to the possibility of their being twisted off or stripped they are now made separate and can be easily replaced if broken or damaged. The cells are mounted in a substantial box and are made integral with the box by pouring compound between the jars and the sides, and flooding the compound level with the top of the box, which is somewhat above the top of the jars and inter-cell connectors. Tubes placed in the covers extend through this compound and are closed by a removable vent cap, which gives access to the cells for filling with water to replace evaporation. It is good practice to charge these batteries at regular intervals whether they are being used much or not.

Simple Rules to Be Observed.

In general, the observance of a few simple rules is all that is necessary to get the best results from any kind of lead storage battery. The principal rules to be followed are:

(1) Keep the level of electrolyte above the top of the plates.

(2) Never replace evaporation with anything but pure water; the use of dilute acid for this purpose causes much harm, and should never be resorted to until it is known that the specific gravity of the acid cannot be brought up to its proper value by continued charging.

(3) Do not make a practice of charging batteries when only a small percentage of their capacity has been taken out, except, as above noted in ignition service, where the length of time necessary to take out a larger percentage might be too long.

(4) Do not allow the batteries to remain an unnecessary moment in a discharged condition, and at intervals see that the battery is charged to its maximum.

AUTOMOBILES AS AN AID TO AMERICAN RAILWAY SERVICE

PHILADELPHIA, July 6.—The Pennsylvania Railroad Company, as an experiment, introduced the use of automobiles to expedite the handling of freight between stations in large cities. Such a service has been started between Kensington and Shackamaxon stations in Philadelphia, and if that is a success it is planned to try the same experiment in other large terminal cities, such as Pittsburgh and Baltimore. The automobile truck which the Pennsylvania Railroad is using in Philadelphia has saved between six and twelve hours in the handling of package freight between the stations named. This freight automobile has a capacity of five tons and is driven by a six-horsepower electric motor. It averages about seven and one-half trips a day, carrying 2.2 tons per trip, its daily mileage averaging about eight miles.

Previous to the introduction of the automobile in the Kensington district, small lots of freight were sent from station to station in cars. With the automobile service congestion is relieved and the movement of freight by a direct route instead of a circuitous one saves both time in delivery and the use of freight cars. The Pennsylvania Railroad is also bringing the automobile into use in its passenger service. In Jersey City an innovation is the introduction of large automobile trucks in the baggage service. These trucks are about the size of a three-horse wagon and are so built that when being loaded the floor of a truck is on a level with and flush against that of a baggage car.

Many hard knocks are in this way saved to every trunk handled in this way through the Jersey City station. In moving a trunk from the car to the truck it receives about the same handling it would get in being shifted about inside the same car. This is but one of the trunk protective features of the trucks. Another is that they are enclosed entirely with a wire grating and leather top, preventing any scraping or falling in the trip across the river.

The service to which the new trucks are being put entails through trips between the baggage cars and the Twenty-third street station in New York. They are loaded to their full capacity and are raised and lowered between the ferry level on elevators. The electric power does away with the manual labor formerly necessary to push loaded trucks up the heavy grades at the approach to the ferries at certain stages of the tide. The truck is about fifteen feet long and five feet wide, with a seat in front for the driver. Its height, of about nine feet, is necessary, that the floor of the truck may meet the baggage car floor on a level.

Not only in Jersey City is the automobile being used in the passenger service. In Broad street station, Philadelphia, there are in use automobile trucks for baggage and mail. These, however, are about the size of an ordinary hand truck, and very similar in appearance. The electric mechanism is placed under the body of the truck and is operated from the handle or "tongue."

So satisfactory have these automobiles proved in the baggage and mail service that there are now being built a number of small electric trucks for use in the new terminal station in Washington. These will be similar to the trucks now used in Broad street station, though they will embody improvements which are expected to overcome the slight difficulties which have been experienced with the first automobile trucks that were placed in service.

ALCOHOL VERSUS GASOLINE AS FUEL FOR AUTOMOBILES

IN reply to inquiries from the United States, Consul-General Robert P. Skinner, of Marseilles, furnishes the following information relative to the status of alcohol and gasoline as power producers in France and the efforts which bave been made toward the general use of the former:

Real and rapid progress has been made in overcoming past objections to the use of alcohol, and when thc price of denatured alcohol is somewhat lower than the price of gasoline, it can be substituted for the latter, both for automobiling and general purposes. Former reports showed that tbe high cost of alcohol, excessive consumption, and the resulting oxidation of mechanical parts had not been counterbalanced by any discoverable advantages. How seriously these problems have been attacked may be judged from the expression of an informant—perhaps the most important French manufacturer of carbureters.

We estem the questlon of the lndustrial use of the alcohol motor as definltely resolved, and the carbureters created ln vlew of tbls utlllzatlon have given satlsfactory results. The use of alcohol will become more advantageous when an understandlng ls brought about between the producers, whereby prices shall obtaln some fixlty, and when the State shall have solved the questlon of the denaturlng agent.

If ingenuity has mastered the material difficulties in the way of substituting alcohol for gasoline, commercially the problem is almost as insolvable as ever; and if it is insolvable in France, where gasoline is dear and alcohol relatively cheap, it must be still more so in the United States, where gasoline is cheap and alcohol is dear. Nevertheless, with raw material available for the manufacture of alcohol in every country under the sun, and with very few gasoline producing centers, it is hardly venturing too much to assume that ere many years there will be a permanent and general use of alcohol as a source of motive power.

Coke Gas Combined with Alcohol.

The one serious and sustained practical experience with alcohol as a driving force in France is that of the Compagnie Générale des Omnibus de Paris, the heavy public vehicles of which traveled 2,218,291 miles between June 11, 1906, and November 1, 1907, propelled by a mixture of 50 per cent. of carbureted alcohol and 50 per cent. of benzol. Benzol, it may be added, is of recent manufacture in France, where it is obtained by the condensation of gases recovered from coke.

This experiment is conclusive in its material aspects, but it is successful commercially only because of the artificially high price of gasoline in the city of Paris, brought about by the imposition of an octroi tax of 20 francs per hectoliter ($3.86 per 26.41 gallons). The effect of this municipal taxation is such that in Paris gasoline was worth in November last 56 francs per hectoliter ($10.81 per 26.41 gallons) against 39 francs ($7.52) for carbureted alcohol, the octroi duty upon which is only 5.10 francs (98 cents) per hectoliter. These octroi taxes vary greatly in different municipalities, and leaving them out of consideration, the general price of gasoline in France last November was 36 francs ($6.95) per hectoliter and that of carbureted alcohol 33.90 francs ($6.54). Though the advantage as to price is apparently with carbureted alcohol, it must always be remembered that the consumption of this fuel exceeds that of gasoline by about 5 per cent. Thus, for the moment, while alcohol motors can be used and are used, no real economy has yet been effected by the use of alcohol as a driving fuel.

Government Consideration—Manufacturers' Views.

The French Parliament is now actively considering the subject in all its aspects, and the proper committee has recently summoned to its sittings various distillers of alcohol and manufacturers interested in its use. The following are translations of two letters addressed to the Parliamentary Commission by auto manufacturers. A firm at Vierzon wrote:

In reply to the questions whlch you bave addressed to us ln regard to the means necessary to extend the lndustrial and commercial use of alcohol, we beg to say that carbureted alcohol wltb 50 per cent. of benzol possesses all the advantages of gasolline. Thls product, employed ln a good carbureter, does not grease the motors, and only attacks the valves. The slight accumulation of grease whlcb we have recognized arises cblefly from the denaturing agents employed by tbe administration. Durlng several years we have made use of carbureted alcobol, and the only disadvantages which we have recognized are the difficulty of obtalning supplies while en route and the awkwardness growing out of the instablllty of prices, which discourage the partlsans of alcohol.

A concern at Billancourt wrote as follows:

We desire to state that we bave few devlces constructed for the use of alcohol, for these reasons: Up to thls time there has been no economical reason why carbureted alcohol should be employed; on the contrary, the cost of gasolline ls lower. Moreover, carbureted alcohol causes a more rapid deterloration of the motors tban gasoline, on account of the presence of water whlch ls found ln the alcohol, and which, producing a condensation upon the metallic linings, causes them to rust.

In order that pure alcohol or carbureted alcohol may replace gasoline, it ls necessary that the cost per horsepower be notably lower tban the cost obtalned by tbe use of gasoline.

It ls possible to put motors ln movement wlth carbureted alcobol without first heating them, although thls ls less easy and less sure than witb gasoline; but with pure alcohol it ls necessary to heat the carbureting apparatus by means of an exterior envelope before satisfactory results can be obtained. In conclusion, we have only utilized alcohol or carbureted alcohol ln order to conduct laboratory experiments and for one or two races.

CONCERNING THE OTHER SIDE OF THE QUESTION

WEIRD and fearful reports and articles on the dangerous man-killing automobile were rushed through the German press when the official figures of 4,864 accidents in one year, with 145 deaths and 2,419 injuries, were issued in one undifferentiated whole, says *The Car*. In order to have a carefully made analysis, the Government handed the whole of its collected material to the well-known pioneer of automobilism and technical expert, Major-General Becker, to sift causes and results, and to embody his deductions in a pamphlet. The General devoted special attention to the 145 most serious accidents, and found that the official reports divided them as follows: Thirty-five children were run over, and 52 adults; there were 22 collisions; and 23 houses, walls and trees, etc., were run into; and 13 accidents were caused by horses taking fright. Now comes the *dénouement*, which is very unpleasant for the prejudiced antimotorist. In 110 of these 145 cases the law could not enter into action, as the fault was not on the side of the motorist. When, however, punishment was deserved it was meted out heavily, and nobody could enter a plea of prejudice even in the least degree. In 58 cases there could be no police summons or law action taken; in 8 of these accidents, however, the driver himself was killed. In 42 cases legal action was commenced, and then quashed, as no case could be made out. In 10 cases the motorist was acquitted, in 2 cases the drivers could not be found. In 1 case a police fine was ordered. In 17 cases the verdicts were imprisonment from a week upward to a year and a half, and the remaining 15 cases were not settled when the statistics were issued at the end of April.

LETTERS INTERESTING AND INSTRUCTIVE

CONCERNING SOME ITEMS OF DESIGN.

Editor THE AUTOMOBILE:

[1,456.]—Please let me know through "Lettere Interesting and Instructive" how to calculate the horsepower of a gasoline motor according to the latest formula; how to calculate the size of valves for the average automobile motor; and how mucb compression space is generally used. JOHN HOFSASS, JR.

Baltimore, Md.

The latest "popular" formula is that of the Association of Licensed Automobile Manufacturers, and consists of $\frac{D^2 \times N}{2.5}$ = horsepower, in which D = bore of the cylinder; N = the number of cylinders, while the denominator, 2.5, is a constant derived from calculations on a number of standard motors generally conceded to be the most efficient types. There are hundreds of other formulas of various kinds, but none of them, seem to represent any great improvement on the old steam standard of $\frac{PLAN}{33{,}000}$ = horsepower, in which P = the mean effective pressure throughout the power stroke; L = the length of the stroke in inches; A = area of the piston head on which this pressure is exerted, thus corresponding to D^2 of the A. L. A. M. formula, while N = the number of power strokes per minute, the denominator being Watts' standard horsepower equivalent.

In earlier practice it was customary to make the inlet valve 1-4 of the cylinder in diameter, and the exhaust valve 1-3 of the bore, while the lift necessary to give a theoretical full opening of the usual poppet type of valve was 1-4 of the valve diameter. However, as precedents these figures are now valueless, it having been customary with motor designers during the past four or five years to make the valves as large as possible, and it is now nothing uncommon to find valves that are half the cylinder diameter in the case of both inlet and exhaust, while some will even exceed this by a slight margin. This permits of the reduction of the lift of the valve to obtain the same effective opening and makes a more quiet running and durable mechanism. It is customary to make the compression space 25 to 30 per cent. of the cylinder volume, but this, like many another point of motor design, is something on which numerous differences are found in practice, though most of them are not radical by any means.

WIRE SIZES USED ON MAGNETOS AND DYNAMOS.

Editor THE AUTOMOBILE:

[1,457.]—Could you please give me any information concerning the sizs wire they use on tbe magnetos and dynamos for eparking? A. DICKIE.

Newark, N. J.

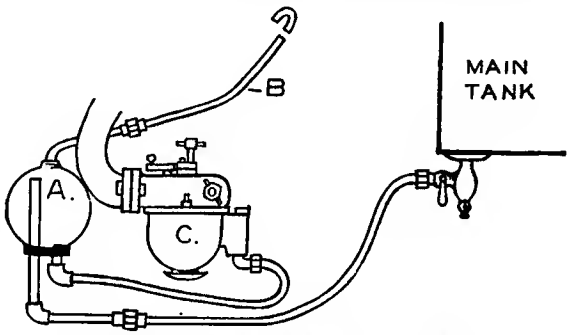
The winding of the armature of the average magneto for high-tension service is made up of wire ranging from about 30 to 25 B. and S. gauge, or its equivalent in metric sizes, in the case of foreign made machines, each maker naturally having standards of his own, but most of them are said to fall between the range given above. In the case of the armature winding of the true high-tension type of magneto in which the high-tension current is generated directly in the armature, the two windings differ very little in size. As a matter of fact, they are really a single winding. In the high-tension-with-coil type the single winding on the armature is larger, and the coil itself has the usual primary and secondary windings, the latter of which is usually of much higher resistance than is the case with the average coil for battery use. There is the same difference of opinion on the part of designers of small direct-current dynamos for ignition service as to the proper size of wire for armature and field windings, varying, of course, with the output for which the machine is intended.

OF INTEREST TO FORD OWNERS.

Editor THE AUTOMOBILE:

[1,458.]—Being a subscriber to "The Automobile," I have obtained considerable information from your letter department and have been much interested in the inquiries. I am driving a Model N Ford and bave made a few changes that I think would be interesting to others. In making any changes, I bave always proceeded in such a way tbat if euch a change was not an improvement, I could repisce things exactly as they were in the first place. Our runabout, wben received, wae adjusted so that the throttle wae only partially closed wben tbrottle lever was clear forward. This is probably necessary to prsvent amateure from stalling the engine, but it is certainly not the proper final adjustment after one has learned to master the car and the machine has become limbered up. By cbanging the set screw on the carbureter and shortening the connecting rod I adjusted the throttle to close entirely, when throttle lever ie clear forward. Now, while driving, if a quick stop is necessary, merely closing tbe throttle and applying the brakes is more efficient tban the brakee alone and the engine is also ready to act as a brake at any time by simply closing the tbrottle. This simple little change hae made driving half again as easy for myself as well as others of my acquaintance.

When driving the car the first montb or so, I kept only two or three gallons of gasolins in tbe tank and invariably on any of our steepest bills I was stalled, for the reason that tbe gasoline would not flow up-hill. I am enclosing a sketch of tbe device I



Ingenious Auxiliary Tank Fitted to Ford Runabout.

made use of to prevent this. It works to perfection. There are few continuoue grades over three miles long, and witb this device, wbenever a level or nearly level stretch ie reached, the auxiliary fills, and the steeper the next grade is the better the gaeoline from the auxiliary will flow to the carbureter.

People generally consider the Ford cars noiey, especially on the low gear, but they don't accuse our car of that now. With a 6x24-inch sheet iron tank and a few pipe fittings conecting it with the muffler that wae on the car, I have made the exhaust absolutely silent. There is no increase in tbe back pressure, for I bave made use of no baffle plates whatever, but by merely retaining and cooling the exhaust gases that much more, tbe pressure is reduced to practically nothing. Several of your correspondents have inquired into the magneto question, and I hops my experience will be of some benefit. I have attacbed and am using a K-W magneto on our runabout and find it all the makers claim for it. It did not work perfectly, however, with the coil and vibrators on the car until we bougbt a K-W Master vibrator to use in series with tbe magneto, and the old coil with vibrators shunted out. Thie capped the climax. The Master vibrator itself is as much of an improvement with either the battery system or magneto as tbe magneto is over the battery. The engine runs as smooth as silk, cranke easily on tbe magneto, and certainly ebows more power tban it ever did.

Now, if I have not taken up too much space, I would be greatly obliged for a little information on the following: Ford owners know that it is no easy matter to disassemble the carbureter in case tbe float level neede to be changed. I have read that the float level was not an all-important factor, but I think tbat the float level ehould be about right to get the best results in etarting the engine and also tbrottling it down. Instead of taking the carbureter to pieces and bending the prongs holding tbe float, why would it not be better to make a threaded gaeoline valve stem with a nut and lock nut and adjust the float level by changing the

position of this nut on the valve stem without taking the carbureter to pieces at all? Also kindly inform me as to what the makers of shaft-driven rear axle units depend upon for strength when no strut rods are used and the rear axle is fastened to the chassis merely by means of the driveshaft housing?

Otto, N. Y. DAVID L. BROWN.

There appears to be no reason why the expedient you mention with reference to being able to adjust the carbureter float level from the outside should not be feasible and work all right. While we do not believe the float level is an important factor where the mere running of the motor is concerned, and do not believe that it is responsible for erratic running in more than a fraction of the cases in which the latter is attributed to it, where economy and efficiency are concerned, it is desirable to have it adjusted properly to give the best results. The tubular housing of the driving shafts is made very strong and the sleeve surrounding the drive shaft is also made to take all the strains ordinarily imposed on the torsion rod. This type of construction has proven very successful on some prominent American cars.

BATTERIES FOR LIGHTING ON THE CAR.

Editor THE AUTOMOBILE:

[1,459.]—Will you please reply in the columns of "The Automobile" to the following? Will ordinary dry cells run a 6-volt lamp continuously for several hours at a time, or would such a lamp require a Sprague battery? There seems to be a conflict of opinion on this subject among electricians. Some say for constant use for hours at a time dry cells would polarize; others say dry cells would prove as satisfactory as storage, except possibly their life would be somewhat shorter. Can you shed some electric light on this subject? GEORGE A. FAY.

Meriden, Conn.

Dry cells would be useless for such a purpose for the reason that they would polarize, as some of your advisers have already informed you. The dry cell is what is known as an open-circuit type of cell, in that it is only designed for intermittent service. It must be allowed to recuperate between drafts upon its available supply of current. If not, it shortly fails altogether, and this was the reason why it proved so unsatisfactory for ignition service on early cars in which poorly designed coils and timers made excessive demands upon it. The storage battery is the only method of lighting such lamps, but it can be kept charged constantly by means of a direct-current generator and automatic cut-out, the former being run by the motor. Couple a six-volt lamp to six dry-cells in series and you will find that there is a drop in voltage as evidenced by the dimming of the light after a few minutes, while at the end of the tenth minute at the outside the effective candle-power will be *nil*. Probably there are few things about a car that have been so universally misunderstood as the dry cell, and for this reason it has been generally condemned, simply because it could not do what it was never designed for.

TO PREVENT RUST ON WHEEL RIMS.

Editor THE AUTOMOBILE:

[1,460.]—What is the best preventive of rust on the wheel rims of my car? The climate here is very damp, and I do a good deal of wet weather driving, with the result that I encounter continuous trouble in the way of rusted rims, which rapidly rot and cut the tires, until the casings finally are in such condition that they pull off the rim in a fashion that leaves them beyond repair. When the car and the tires were new I experienced no trouble of this sort, which I attribute to some preparation that was on the rims, but which has since worn off. If you can tell me what this was, you will greatly oblige a new recruit. ROBERT JEWETT.

Marshfield, Ore.

For the protection of tires and rims from the effects of moisture, it is usual practice to keep the latter well painted, or to give them a coat of shellac from time to time. Any neglect of this precaution is declared by the tire makers, and by most users generally, to be fatal to satisfactory results, as would appear to have been the case in your experience. We would advise you to profit by this, and hereafter keep your rims in good condition. Probably it will be necessary, before applying the first coat of shellac—which dries more quickly and is fully as effective as paint—to clean off all the rust now on the rims. This can best be done by the use of emery cloth, applied with a liberal quantity of elbow grease. It hardly seems possible that all of your trouble can have arisen from the mere rusting. From the wording of your query there would appear to have been considerable rim cutting, which never occurs except when tires are run insufficiently inflated, though rusty rims will aggravate it. Keep your tires pumped hard at all times and do not let any one dissuade you from this practice by specious arguments as to smoother and easier riding. Tires may easily become the greatest source of annoyance about a car, if improperly looked after, but if rightly cared for will afford wonderful service.

DATE OF THE FIRST SIDE-ENTRANCE TONNEAU.

Editor THE AUTOMOBILE:

[1,461.]—Through "Letters Interesting and Instructive," I wish you would tell me when the first model of American-made car with side entrance was put on the market.

Detroit, Mich. THOMAS G. MAY.

We think the 1904 models marked the first use of the side entrance tonneau which had been made possible by the lengthened wheelbases then adopted, and as it was not then the custom to bring out the model of the next succeeding year six or eight months in advance, probably the side entrance tonneau was not seen on an American car in this country much before December, 1903, or January, 1904. Doubtless some of our readers are better posted on the history of this valuable development and can give more definite dates.

A BRIEF FOR THE MAKE AND BREAK.

Editor THE AUTOMOBILE:

[1,462.]—I feel that you are doing an injustice to a splendid system of ignition in your answer to B. Seyfert, regarding the make-and-break spark. He either has a short circuit, or an almost constant contact, or his coil is of no value. I have frequently used dry cells on Duryea engines for weeks at a time, covering probably more than a thousand miles. Have also driven continuous trips with or without a night's rest between, of 150 to 300 miles with them. In these cases the contacts were set for magneto ignition and were much longer than for batteries, because we were never careful to save the magneto current. Coil makers have paid particular attention to coils for jump spark, but the make-and-break has not had this attention and few people have ever tried to produce economical coils. I made for my own use a few ironclad coils in 1898 and 1899 which had the core wires returned over the outside of the coil, thus making each wire into a horseshoe magnet and exposing it to the influence of the current more fully. This added quite materially to the efficiency and economy.

E. J. Stoddard has probably carried these experiments farther than any one else and has taken out patents on some very fine forms of make-and-break coils. And with such a coil your subscriber can run his engine with the batteries his jump spark friends have thrown away. Another thought is that this form of spark will ignite mixtures that the jump spark will not. A Duryea user in Texas, Tom Huling, has applied to his Duryea the best jump spark apparatus he can buy and finds that with this the best mileage he can get per gallon, taking a thousand miles of running for test, is 23.5, but with a fat make-and-break he gets about 30 miles. Does it not seem strange that folks will save a few cents on sparking apparatus and waste money on gasoline? Or that scientific men will argue that the size of the spark makes no difference, when anybody knows that a hot spark will fire mixtures a lean one will not; or that wet wood will burn if the kindling is sufficient. CHARLES E. DURYEA.

Reading, Pa.

A RADIATOR REPAIR THAT LOOKS GOOD.

Editor THE AUTOMOBILE:

[1,463.]—In your issue of June 18, under "Letters Interesting and Instructive" about repairing leak in Honeycomb radiator, I thought I would tell you how I repaired mine. Drain out all the watr, and mix up some Smooth-on (which is used for smoothing new castings) very stiff and hold a piece of pasteboard back of the radiator and fill three or four holes where leak was, and in fifteen minutes you can use it. A. E. GRAY.

Flandreau, S. D.

P. & S. "SIX-SIXTY" AN ENTRANT TO SIX-CYLINDER RANKS

AMONG the numerous models brought out for the present season by the Palmer & Singer Manufacturing Company, New York, none has excited more attention than the euphoniously named "P. & S. Six-Sixty," the latter part of its title showing that it is a six-cylinder car of 60 horsepower. The motor has six cylinders of 4 1-2-inch bore by 5-inch stroke, cast separately with integral water jackets, and is rated at 60 horsepower. The exhaust and inlet valves are on opposite sides of the combustion chamber, and their camshafts are located within the crankcase. The crankcase is divided horizontally into two sections, the upper half holding the bearings for the crankshaft and the camshafts, and the lower half forming an oil reservoir from which the oil is drawn and distributed to the main bearings. The crankshaft runs on seven plain bearings, bushed with a special bronze. The engine is positively lubricated by a pump that drains oil from the sump in the crankcase and delivers it to an auxiliary tank shown just above the exhaust pipe in the illustration. From this tank the oil is distributed to the seven main bearings, from which it is led through the hollow crankshaft to the crankpin, and thence up the connecting rods to the wrist-pins. The oil thrown off by the crankshaft lubricates the piston and cylinder walls, and the surplus drains into the sump. A compensating carbureter of the company's own manufacture is used; it is water jacketed, the water connections being plainly shown in the cut of the inlet side of the engine. The cooling water for the motor is drawn from the radiator by a gear pump situated on the exhaust side of the motor. Power is transmitted from the engine through a multiple disc clutch with forty-nine steel-to-steel discs. The clutch is located in the same housing with the change-speed gears. Four speeds and a reverse, operated selectively, are provided with the direct drive on the third speed, as is now customary.

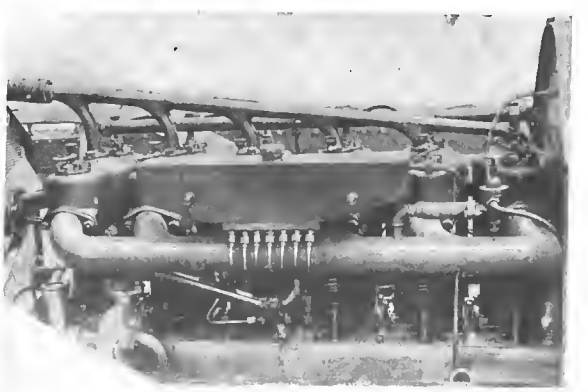
Lines of the New "P. & S. Six-Sixty," with Baby Tonneau.

The gear ratio on the third speed is 3 to 1 and on the fourth 2.1 to 1. The clutch and gears are lubricated by a non-fluid oil, and it may be a surprise to many to know that the clutch operates satisfactorily even when packed in heavy grease. The change-speed gears run on imported F. & S. bearings. These bearings are used throughout the car, with the exception of the crankshaft. The final drive is by a cardan shaft, fitted with two universal joints to the live rear axle. The universal joints are packed in grease and rendered oil-tight by leather caps. The rear axle is fitted with radius rods and a torsion rod, which insures alignment even under the most severe stresses.

Two separate and distinct systems of ignition are used—viz., a Bosch high-tension magneto, which is shown on the inlet side of motor, and a dry battery system with single coil and secondary distributer. Two sets of equalizing brakes are fitted, both operating on the rear wheels. Steering is irreversible, through worm and sector gearing, with universal joints at all steering connections. Spark and throttle levers are on a quadrant on the steering wheel convenient to the right hand, and a foot accelerator is provided. A 28-gallon fuel tank is suspended from the rear of the frame from which the fuel is forced to the carbureter by exhaust pressure. Grease cups are liberally used on all steering and spring connections.

The P. & S. "Six-Sixty," as it is called, is made in one model, but is fitted with three styles of body—viz., runabout with single rumble and double rumble seats, and light touring with baby tonneau. The wheelbase is 125 inches, with a tread of 56 inches. The frame is of channel section chrome nickel steel and trussed to insure rigidity. It is mounted in long semi-elliptic springs both in front and rear, giving easy riding qualities. The front wheels have ten spokes and the rear wheels twelve spokes, and both are fitted with 34 by 4-inch Diamond tires mounted on Marsh detachable rims, although any make of tire will be furnished at the option of the purchaser.

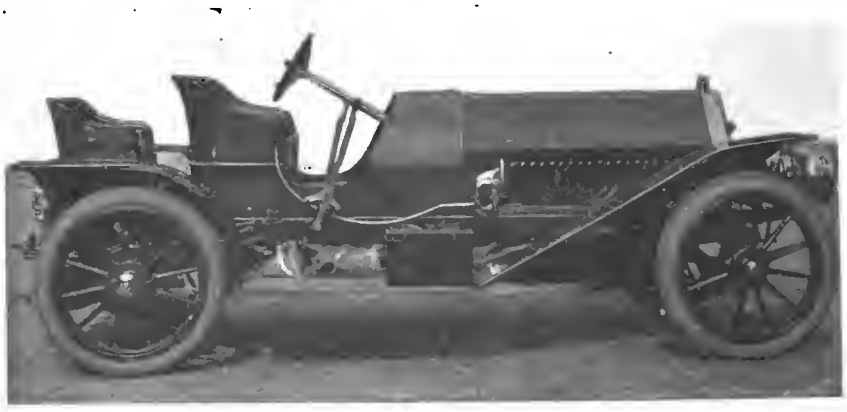
Inlet Side of Motor Showing Manifold Design.



Exhaust Side Showing Location of Oil Tank.

BRIEF SPECIFICATIONS OF THE NEW "JEWEL" ROADSTER

UNDER the title of the "Jewel 40" roadster, the Forest City Motor Car Company, Massillon, O., are building the new runabout type shown by the accompanying photograph. The motor is a four-cylinder vertical Rutenber, the dimensions of which are 4 1-2-inch bore by 5-inch stroke, and it is fitted with a Schebler carbureter. For ignition a dual system is employed, consisting of a Bosch high-tension magneto for the running side, with an Exide storage battery and Connecticut four-unit dash coil for starting and emergency use, two sets of independent spark plugs being employed, and the wiring is so arranged that either of them can be instantly brought into use by means of a switch conveniently located on the toe-board. A double system of lubrication is also employed, a self-contained oiler being placed in the crankcase, while this is supplemented by a six-feed mechanical force-feed oiler in addition.



Lines of the Latest High-powered Roadster from the West.

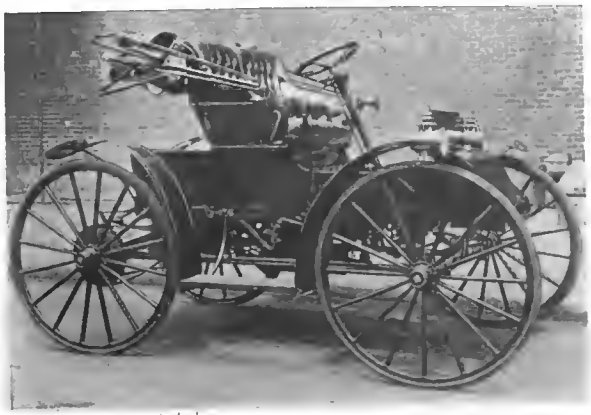
A conical type of leather-faced clutch, employing cork inserts, a three-speed sliding gear on the selective plan and a straight line drive to a full floating type of rear axle, comprises the transmission of the car, the gear ratio being rather high, that is, 2.5 to 1. The front axle is a one-piece drop forging of I-beam section, the front and rear wheels being carried on Timken roller-bearings, while the same type is also employed on the gear-set and steering knuckles. The frame is of the usual channel section pressed-steel construction and is supported on semi-elliptic springs forward and a platform type of suspension in the rear. Double brakes of the usual internal expanding and external contracting types placed in special drums on the rear wheels are fitted.

ANOTHER BUGGYABOUT HAILING FROM THE EAST

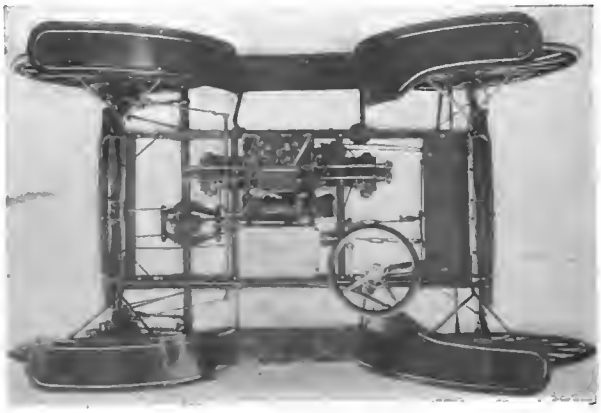
THOUGH this part of the country was the home of the buggy type of automobile in that the pioneer American automobile that wrote its name large on the history of the then nascent industry, hailed from Pennsylvania, the Middle West really discovered its value and the large field that exists for it. Now, however, interest in these handy little vehicles again seems to be shifting eastward, as evidenced by the production of a car of this type right in New York City. This is the P. M. C. solid tire runabout, which is being built by the C. S. Peets Manufacturing Company, 60 West Forty-third street, New York City.

The power plant consists of a two-cylinder horizontal opposed, air-cooled motor, the cylinder dimensions of which are 4 1-8 by 3 3-4 inches, while its rating is 12 horsepower. Lubrication is taken care of by a six-way automatic force-feed lubricator, while ignition is of the high-tension type, employing a set of dry cells and a double-unit dash coil and low-tension timer. The carbureter is a Breeze automatic. As will be evident from the plan view of the chassis, the motor has been placed practically in the center of the heavy angle-steel frame, while the drive from it is first taken to a countershaft from the two-speed and reverse planetary gear-set, and thence to the rear wheels by double chains.

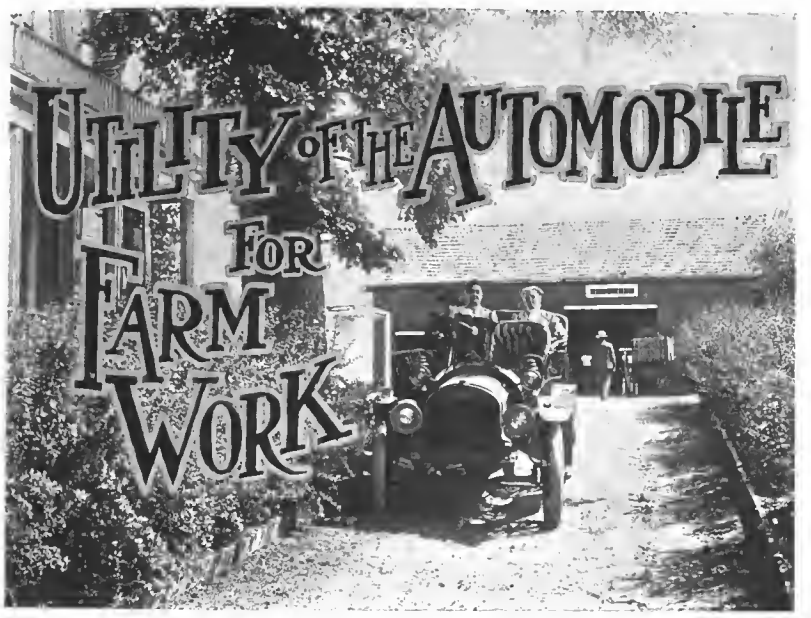
Brakes are of the band type, placed on rear wheel drums, while the wheels are 38 inches in diameter and are shod with 1 1-4-inch solid rubber tires. The wheelbase is 70 inches, while the tread is standard; complete the car tips the scales at 900 pounds and lists at $550, the top being extra.



P. M. C. Solid Tired Runabout Ready for the Road.



Plan View of Chassis P. M. C. Solid Tired Runabout.



On Pleasure Bound—No Small Rôle in the Life of the Farmer's Auto.

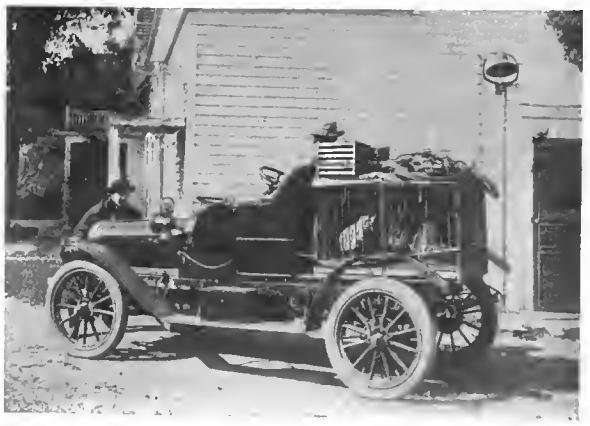
THAT there is an especially rapid and growing tendency to-day among the most far-sighted of American farmers to so systematize their farm business as to effect the greatest saving in time, labor and expense is aptly demonstrated by the general adoption of what is known as the utility, or practical, automobile on thousands of the best managed farms. While time and labor-saving machinery has marvelously widened the range of his productive capacity, the means by which the farmer himself was to keep pace with this progress has been a longer time in coming. The average farmer spends too much time getting from place to place. He works his horses almost as hard whether he is taking a load of produce to the city or just going in on business. The care and attention required by horses incident to a pleasure drive, a trip to church or to town is just as great as the task of preparing them for work in the field. But the most discouraging fact of all is this—the farmer himself and his family rarely can give any time to recreation.

If the practical automobile accomplished no more than to save a farmer's time, to provide pleasure and health to his family and to leave his horses fresh for that work for which they are better fitted it would certainly be a good investment. The fact seems to have been amply proven that the dependable utility car actually costs less to keep, can do ten times as much of different classes of work, is always ready for service and is much less troublesome to care for than the horse. Ten years ago the automobile was an experiment. With the reckless rich it is still a fad. But to-day some types of automobiles are so designed that they have become a practical success and a recognized necessity. Now that a strong, durable, common sense machine that uses very little fuel can be had at a reasonable price, we find country people in many localities enjoying the comfort, convenience and economy of good automobiles.

There are some striking differences in automobiles. The car that would give satisfactory service on the city pavement and the level country might be a failure on the farm. Given a machine that hills cannot feaze nor muddy roads balk, and important requirements of the farmer have been met. That gasoline is the cheapest motive power known has been amply proven. It has been definitely shown that in the most dependable cars the average cost of fuel and lubricating oil would not exceed one cent per mile, and this for a car capable of carrying five passengers. A driving horse ordinarily cannot travel more than 50,000 miles during his lifetime, even though he does not go lame. Many automobiles cover a great part of this distance in one or two seasons. That the horse has his rightful place on the farm is not yet to be denied. There is certain work which he can do which the automobile cannot, but it is mostly in the field—certainly not on the road. Consider the convenience to be enjoyed if in thirty minutes a man living fifteen miles from town can, should occasion require, make a trip to the city, transact his business and run back, spending but one hour on the road. Horses for certain kinds of service, including work horses and thoroughbreds, will always be in demand, but to-day the farmer cannot allow sentiment to stand in the way of his own comfort, his own profit and his own business progress, and the average American farmer is too far sighted to do so.

Like the telephone, the trolley car and the rural free delivery, the automobile has naturally come to weld a firmer link between the business men of the country and of the city. Farms in Texas which could not be sold, in spite of their greater fertility, before the arrival of the practical automobile, are now greatly

Milk That Would Otherwise Be Fed to Pigs Owing to the Distance from Market.



Only One of the Many Uses of the Car.

increased in value and brought within what is considered easy distance of the market, although this distance is often between thirty and forty miles. When it is considered that the utility automobile possesses such power equipment that it can travel the worst roads in any season of the year, can negotiate any hills which could be climbed with a horse and wagon and requires but the simplest attention, it seems to be pretty well adapted to the uses of the farm.

The expense of up-keep in some cars has been reduced until to-day a man can operate a car, spending less for oil and gasoline than the cost of feeding a horse. It is worthy of note that the car is a matter of expense only when in actual operation, and that while in operation its road capacity is at least four times that of a horse-driven vehicle. As for repairs, if the car is given reasonable care and attention, they should be little in excess of the cost of shoeing and repairs on harness, etc. In point of operating knowledge, even were this not simple enough, the farmer has a great advantage. Primarily, he is more of a mechanic of necessity than the city man. But his chief advantage lies in the fact that he knows something about machinery and is, therefore, able to save the expense of practically all repairs that might become necessary through accident. The foregoing photographs were taken on the farm of a Rambler owner. He is an old horseman and he still retains his horses for that farm work to which they are best adapted. However, as a means of saving time, he uses the automobile, and it goes without saying that he is but the forerunner of a vast army of American farmers who will shortly come to recognize the great possibilities that the automobile holds for them, and then the now prevailing prejudice against the power machine will disappear entirely.

It Is a General Utility Vehicle for Everything.

STANDARDIZATION RATHER THAN SPEED.

The "Canadian brother" coments favorably on the American automobile manufacturer, as will be noted in the following, taken from a recent issue of the Toronto *World*:

American manufacturers are naturally proud of the number of automobiles which are constructed and sold every year in this country, but the output, instead of lessening, will be increased over and over again. No man can forecast precisely what direction the development of the industry will take, but, speaking in a general sense, the dominant tendency from now on will be towards standardization rather than speed. This means, of course, the construction of an automobile which will be staunch enough to last not for one season alone but for an indefinite period, and render for that period continuous service with an imperceptible amount of wear and tear. This tendency toward staunchness and standardization will have the effect of putting the automobile business on a sounder basis, financially and otherwise, than it has ever been up to the present moment. Standardization will tend to discourage cheap and careless manufacture.

THERE ARE MANY WAYS OF USING A CAR.

No market for automobiles is opening faster than that presented by the farmers throughout the entire country. Prosperous beyond all previous experience, they have the money to spend and are spending it for automobiles, as the books of any car manufacturer will show. Presumably the

How an Old Ford Makes the Sawdust Fly.

farmer buys a car primarily for pleasure, but its practical valuc quickly appeals to him and is as quickly put to test, so tbat the car that was bougbt for pleasure is at daybreak grinding feed for the cattle and cutting wood for the fires, and then takes the children to school. At noon it brings the farm hands in to dinner, in the afternoon it runs the dairy or pulls a snow plow or a road scraper, and at night is used for a pleasure trip. An illustration of the practical value of the automobile is found in Louisburg, Kan. C. C. Williams bought a Ford runabout three years ago and recently he bought a second. The picture shows the original car cutting wood.

PROPOSED BOULEVARD SYSTEM FOR MONTREAL.

MONTREAL, QUE., July 3.—Plans for beautifying the city of Montreal by the establishment of boulevards and driveways have been submitted to the parks and ferries committee by the Architects' Association of Montreal. The idea is to have a great boulevard from Mount Royal to St. Helen's Island, across the river from Montreal. The plans comprise the first systematic attempt to establish boulevards or driveways between the various parks of the city at anything like a reasonable cost, as it is contemplated utilizing the streets and property of the city practically all the way, so that it has been found possible to greatly reduce the appropriation necessary to carry out the work.

WITH THE MANY UPHOLDERS OF THE LAW

WARD LAW GREATLY CONFUSES OHIOANS.

COLUMBUS, O., July 6.—There seems to be much confusion in the minds of owners as to the provisions of the Ward automobile law and the interpretation of it by Secretary of State Thompson. Some bave interpreted the statement of Secretary Thompson that he would disregard the opinion of the solicitor of Cincinnati as to the right of cities to issue licenses, to mean that he will ignore the provision of the Ward law, which exempts for this year all autos which have paid city licenses. Letters are pouring in upon the secretary protesting against this.

The Ward law expressly exempts all machines owned in cities requiring annual licenses, and which licenses have been paid for 1908. Such machines will be exempt this year, but next year will come under the law and pay licenses to the State, excepting in Cleveland, where a perpetual license ordinance exists. Those who have such licenses must pay the State license this year. City licenses will be optional with the local governments.

Two serious defects have been discovered in the Ward law. There is no authority for putting a date mark on the tags, and no one can tell whether the license a tag represents is in force or has expired. Again there is no license year established. Each license issued will be good for one year from date, so that licenses will be continually expiring. This will make the enforcement of the law very difficult.

A VERY INGENIOUS AUTO TRAP.

PERTH AMBOY, June 17.—Catching offending automobilists by electricity is the latest device of the New Jerseyites. Detective Lester J. Underhill, of this city, is the prime mover in the latest scheme now being worked in this part of New Jersey.

The device consists of a large wooden reel containing 1,370 feet of two-strand insulated wire, six battery cells, push buttons and bells. Underhill and his assistants carry this apparatus to some point along the post road and stretch the wire by the roadside. As soon as an auto reaches a point opposite the first man the signal is flashed over the wire to Underhill, at the other end, and he immediately catches the moment on one of two stop-watches which he holds. The second watch is stopped when the auto passes him, and he rapidly takes the time elapsed. If it is over the speed limit, he signals a third man to flag the auto, and if those in the machine ignore the warning, a fourth man stretches a rope across the highway.

In answer to criticism about the use of the rope, Underhill said to THE AUTOMOBILE man that it was not for the purpose of wrecking the machine, but is simply used to make the driver of an offending car reduce speed long enough to enable the constable to secure the number of the car.

SUSTAINING EQUAL RIGHTS ON THE ROAD.

WORCESTER, MASS., June 28.—Judge Sherman, sitting in the Norfolk Superior Court, has ruled that automobiles have as much right in a roadway as carriages, and that chauffeurs are within their rights in sounding a warning horn. This decision was handed down in a suit for damages caused by a runaway horse that had been frightened by an automobile horn. Decision was in favor of the defendant and establishes a good precedent.

HARTFORD TO BAR MUFFLER CUT-OUT.

HARTFORD, CONN., July 6.—It is evident that the Hartford police will insist on the discontinuance of the use of the muffler cut-outs within the business sections at least. The mayor has circulated a warning among the autoists to abate the nuisance of "too much noise." The Automobile Club of Hartford has taken the matter up and will prosecute it vigorously.

WHERE BULLET PROOF TIRES ARE WANTED.

WASHINGTON, D. C., July 6.—Automobilists in this city are threatened with another warfare similar to that waged against them by Marshal Collins on the Conduit road. The latest aspirant for fame as an automobile baiter is Bailiff Hewitt, of Rockville, Md., who has been granted authority by the council of that town to disable the car of any automobilist who exceeds the speed limit of six miles an hour and who declines to halt at command. Bailiff Hewitt is reported to be a crack revolver shot, and has spread the news that in enforcing the town ordinance regulating the speed of automobiles he will not hesitate to fire at the tires of the machine if the driver fails to halt when commanded. There is a fine pike leading from Washington to Rockville, and it is used by hundreds of automobilists. Infractions of the Rockville speed law have been overlooked by the town authorities, and as a result some automobilists have come to the conclusion that they had a free rein when using the pike. The consequence is that many will suffer for the faults of a few. The Automobile Club of Washington will likely step into the breach and straighten out matters to the satisfaction of all concerned.

TAX, NOT TOLL, FOR MARYLANDERS.

BALTIMORE, July 6.—City Collector Frank Brown has expressed himself most emphatically in favor of an extra session of the legislature being called to pass suitable laws to check speeding of automobiles within the State. He declares the indifferent action of certain autoists does more to ruin the roads than anything else, and he does not think the State should spend any of the $5,000,000 at its command for improved highways until proper action is taken against speeding autoists. Ex-Governor Warfield and other influential Marylanders have expressed themselves as favorable to Governor Crothers' suggestion to tax autoists, and in this way have them help the good roads cause. They point out that on the new proposed State roads the autoists will not have to pay tolls as they have to do at present on the pikes. The tax would be a small item compared to the excessive tolls charged by turnpike companies.

BALTIMORE HAS "GASOLINE SQUAD."

BALTIMORE, MD., July 2.—The Baltimore Police Department has organized a motorcycle squad for duty along the smooth thoroughfares of the city. These streets have been used as speedways by a certain class of autoists, scaring horses and making it dangerous for pedestrians. The police believe that they will be better able to apprehend these law violators with the aid of motorcycles. The motor police of Druid Hill Park have done effective work, and this has led to the organization of the squad in the city.

MOTORCYCLISTS LICENSED IN SCRANTON.

SCRANTON, PA., July 2.—Hereafter motorcycles will have to be licensed before they can continue to "chug" through this city—that is, if the arrest of A. D. Beemer stands for anything. Beemer was arrested and hauled into police headquarters for motoring without a license. Sentence was suspended, and straightaway the remaining twenty-one motorcyclists took out licenses—also Beemer.

LOWER CANADA LEGAL HAPPENINGS.

CHARLOTTETOWN, P. E. I., July 3.—As recently intimated in THE AUTOMOBILE, several automobile owners have made a test of the anti-automobile law by taking a previously announced spin around the city. Information was laid and the men were fined $500 and costs. Application to quash the conviction was made.

MOTOR EXPRESS MONEY MAKER.

OAKLAND, CAL., June 29.—The wonderful increase in the business of the Interurban Motor Express Company, of this city, since its organization in January, 1907, is due to the use of the modern motor truck, that has demonstrated in every way its superiority over the horse-drawn vehicle. What appeals to business men is the promptness with which business is handled, and the motor company has not been forced to reduce rates in order to secure patronage.

Because of the fact that so much of the freight from the East has to be handled here before being taken to a San Francisco destination, the Interurban Company has come into a vast amount of business. In order to overcome an extra handling of freight, the company has contracts with many of the large wholesale concerns across the bay, and after the loading of trucks here, the vehicle is run across on the ferry and the deliveries made. This business has increased to such proportions that the two large trucks devoted entirely to the trans-bay traffic are at times insufficient to care for it, and for that purpose trailers have been provided to keep up with the demand.

Aside from these large trucks, which are six-ton Americans, the company operates six two-ton Knox trucks. The company will receive six more cars during the summer, two of which are

Roomy Garage of the Oakland Auto Express Service.

five and a half-ton, while four are three and a half-ton electrics, built by the Auto Car Equipment Company, of Buffalo, N. Y.

F. P. Childs, the traffic manager has had a wide experience in the express business, having been for a number of years prior to the organization of the new company engaged in the business with horse-drawn vehicles. He can consequently speak with authority. He said, in discussing the motor business:

One of our small trucks can in a day's work make the same number of deliveries that four teams can, and at half the expense. That may probably not be the case throughout the United States, but it certainly is here in Oakland. Our smaller trucks cover Oakland, Berkeley, Almeda, Hayward and San Leandro. Throughout this entire territory the roads are perfectly level and macadamized, so there is probably no place in the country where trucks can be operated at a smaller expense than here. One of our smaller trucks has covered seventy-five miles in one day's work on ten gallons of gasoline. The excellent streets also minimize breakdowns, and our troubles in that respect are probably extremely low as compared with express companies of other cities.

Some of the leading business men of Oakland are interested in the company, which was organized with a capital stock of $160,000. The garage is used exclusively for the purposes of the company. It is equipped with a complete workshop and all facilities for the maintenance of the trucks.

MARYLAND'S BIG "GOOD ROADS" FUND.

BALTIMORE, July 3.—The Good Roads Commission has visited a number of Western Maryland towns recently. These visits and resultant meetings will take place in every section of the State before actual work on highway improvements begin. It is said that an additional appropriation will be added to the $5,000,000 already granted by the last legislature.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows and Meetings.

Dec. 31-Jan. 7..—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reeves, general manager, 29 West 42d St.

Jan. 16-23.....—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. Office of Secretary, 7 West 42d St., New York City.

February, 1909..—Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. (Exact date to be announced.)

Races, Hill-climbs, etc.

July 11-15.....—Milwaukee, Wis., Wisconsin Trophy Run, Milwaukee Automobile Club.

July 15.....—St. Paul, Minn., Race Meet, Automobile Club of St. Paul, H. S. Johnson, Secretary.

Aug. 14.....—Chicago, Third Annual Algonquin Hill Climb, Chicago Motor Club.

Sept. 5-9.....—San Francisco-Los Angeles Reliability Run, Automobile Dealers' Association of San Francisco.

Sept. 14.....—Chicago, Annual Economy Run, Chicago Motor Club.

Oct. 24.....—Vanderbilt Cup Race, Long Island Course, auspices of Vanderbilt Cup Commission.

Nov. 26.....—Savannah, Ga., Grand Prize Race, Savannah Automobile Club.

FOREIGN.

Shows.

Oct. 11-18.....—Paris, International Congress and Public Exhibition on Roads and Road Making for Modern Locomotion, French Ministry of Public Works.

Nov. 28-Dec. 13—Paris, Eleventh Annual Salon de l'Automobile, Grand Palais, Automobile Club of France.

Races, Hill-climbs, etc.

July 13-17.....—Ostend, Belgium, International Race Week, Automobile Club of Ostend.

Aug. 12.....—Ardennes Circuit Races and Coupe de Liederkerke, Automobile Club of Belgium.

August.....—France, Coupe de la Presse, Automobile Club of France. (Exact date to be announced.)

Aug. 29-30.....—France, Mont Ventoux Hill Climb, Vaucluslen Automobile Club.

Sept. 1-8.....—French Voiturette Contest, Auspices "L'Auto."

Sept. 6.....—Bologne, Italy, Florio Cup Race, Automobile Club of Bologne.

September.....—Paris, Vichy Aeroplane Competition, $4,000 Prizes, Aero Club of France.

Oct. 11.....—Berlin, Germany, Gordon-Bennett Balloon Race, Aeronautical Club of Berlin.

NEW BOOK FOR AUTOMOBILISTS.

Motor Rivals.—This is the latest work of fiction in which the automobile figures prominently. Percy F. Megargel, the transcontinental automobilist, and Grace Sartwill Mason, short story writer, have collaborated in the production, which is being brought out by the Baker & Taylor Company, New York. "Motor Rivals" is a delightfully entertaining novel, based on an automobile race from New York to Portland, Ore.—a route twice covered by Megargel. It treats vividly of various incidents of a trip, shows the usual viscissitudes, and tells how difficulties were overcome far away from civilization and the repair shop, and as the author, or at least one of them, has been through all the experiences himself, he is in an excellent position to tell them interestingly.

For those who are not particularly interested in automobiling, and even some who are, a strong love story is interwoven throughout the race. The race itself is between a medium-power car of American build and a large foreign car of much greater horsepower. The book will be out July 25. The story promises to be a great success.

Three Days with the Autoists in the Scottish Reliability Trials

GLASGOW, June 19.—For the first time for over a week fine weather has signalized to-day's run of 130 miles from Oben, which completes the Scottish portion of the combined trials. To-morrow a start will be made on the journey southwards, ending with a 200-mile race at Brooklands next Friday, but only half the cars will be seen on the road, and thereby hangs a tale.

The requirements of the British trade and buying public alike have hitherto been well served by the searching reliability trials held each year by the Scottish and Irish clubs, and the number of entries—there were 108 for the last Scottish event—have shown the satisfactory nature of the test and of the system of marking. This year the Royal Automobile Club determined to organize a trial which would altogether eclipse the doings of its affiliated clubs, and the present 2,000-mile event is the outcome. The system of marking is novel, but it has yet to be proved superior to the older method, which took into separate account the three factors of reliability, fuel consumption and hill-climbing power. In the present case the Royal Automobile Club has taken the 2,000 miles of road traveling as a preliminary to the final 200 miles race at Brooklands, and the method of marking determines the handicap at the start of the race. Each stop of one minute on the road means one minute's handicap in the race; similarly with the petrol used, each gallon is counted as one minute's delay. In the hill climbs, which total in all to a distance of 22 miles, the penalty for each car is fixed by the number of minutes it is behind the fastest car in its class. The main advantages of such a system as this lie in its simplicity and in the fact that the first car in each class to pass the finishing line will be the winner. Opposed to this, however, is the possibility of an unreliable car going through the trial with constant repairs and tinkering, and on the track proving victorious by virtue of being hopelessly overgeared and by having an extra fourth speed in reserve, which would give it a great advantage.

The popularity of the event can best be judged by the number of starters, 46, while for the Scottish trial, which, although combined with the 2,000-mile event, can be entered for separately, no less than 84 cars set out.

Owing to the absence of the Fords, which would have to compete in a class altogether disproportionate to their price, the number of American entries were but three—a Cadillac and two White steamers.

On Thursday, June 11, the start was made from London, the new White steamer depot and repair works at Camden Town being the official rendezvous. In three daily stages of 150 miles the cars were driven to Glasgow by Saturday night. Excepting the awful weather conditions, this first portion of the tour was singularly uneventful. Mention might be made of the 10-horsepower Zedel, which had been turned out from its German birthplace without a key being fitted to the small differential driving pinion. For over eleven hours the driver and mechanic worked in the rain and finally made a new key out of a spanner, the car continuing the trial as if nothing had happened.

On Monday the route planned by the Scottish Club took the cars through Blairgowne to Aberdeen. The severer nature of the country began to tell its tale, and a trouble frequently in evidence was the overgearing, which had been done to give a good showing in the race at Brooklands. In the afternoon the cars were timed on the Devil's Elbow climb at Glenshee, the highest road in the kingdom, and here the most unusual sight was to be witnessed of a score of well-known cars, of powers up to

Making the Turn at Devil's Elbow, Glenshee.

30-horsepower, having to shed their passengers and to invoke outside assistance. When starting from the line at this event the drivers of the 30-horsepower White tried to get away too quickly and stripped one of the pinions on the rear axle, causing the withdrawal of this car.

Tuesday's run to Inverness included the dreaded Cavin O'Mount, by far the worst climb of the whole tour. On this narrow road the occasional failures blocked the way to all the succeeding cars, and the resulting chaos delayed the arrival of the last cars at the stopping place till after midnight. These delays have also been responsible for the withholding of the official reports till the end of this week, so that it is impossible at present to give any indication of the relative performances of the leading cars.

SOME RECENT BRITISH AUTO DOINGS.

LONDON, June 29.—The past few weeks have been full of activity in the motor world. The Irish Reliability Trials just recently completed are now eclipsed by the more elaborate 2,000-mile event of the Royal Automobile Club, which, to the general mystification of competitors, trade, and public alike, is run conjointly with the Scottish Trials. More concerning this elsewhere; sufficient is it to refer to these events, to the Brooklands meets and to the constant succession of hill-climbs and speed trials to show the sudden accession of vitality which is characterizing the trade at present.

And, speaking of trade, it is pleasant to be able to report that this is strongly on the advance. Britain did not escape the universal slump which has overtaken the motor trade of the world during the past half year, but, fortunately, the effects were not so pronounced as in France or Italy, due, doubtless to the small car trade which the British manufacturer has so well developed and fostered. Not a few firms have disappeared from sight during the period of depression, and more especially so with the agencies for foreign and American cars.

A pair of American cars which go well with the public on this side are the Cadillac and the Ford. The former is noted for its reliability and has a fine record covering all the trials of note during the past three years. This car scored well by the success of the unique standardization test to which it was recently subjected by the Royal Automobile Club committee and which was referred to in these pages at the time. No less remarkable have been the victories of the 15-horsepower Ford. At the commencement of the season two press men visited the London showrooms of the agents and selected at random two cars to be run in all the coming competitions. In their first event at Brooklands the pair ran second and third; next time it was first and second; several hill-climbs have brought them out with fastest times, and finally a gold medal was awarded to No. 1 in the recent Irish trials. The second car did a fine performance up hill the last day of the same event, when some slight carbureter derangement spoiled its record. Unfortunately these two cars are not running in the 2,000-mile trials, as they cannot be entered except in a class which contains cars of over double price, but it will be interesting to follow the fortunes of the pair throughout the rest of the season.

It is generally supposed that motorcycling is a sport which has not acquired much popularity in the States, but in any case news of a recent big event of the London Motor Cycling Club cannot be without interest. Each year this parent club runs off a trial from London to Edinburgh, the 400 miles between the two capitals having to be covered in between 20 and 24 hours. Granted that the roads are for the most part in excellent condition, the length of the run, together with the time limit, gives it special merit. No less than 106 entered and started, added to which were a dozen cars owned by members of the club, who have now forsaken the single track machine.

In spite of the unfavorable weather, no less than 74 of the motorcyclists finished within schedule time. After a day's rest, twelve of these set out again on the return journey to compete for the Schulte Cup, offered for the greatest speed regularity over the 800 miles total trip. Of the twelve, but two failed to reach London within schedule time. An event of this description not only well demonstrates the extraordinary reliability of the modern motorcycle, but also serves to show the great popularity of this type of machine. It is estimated from official figures that the number of motorcycles in use in the United Kingdom is well over 50,000 at the present time, and this total is increasing at an extremely rapid rate.

NUMEROUS ROUND-THE-WORLD DRIVERS IN PARIS

PARIS, June 30.—Though the Round-the-World contestants have not yet finished their trip, a curious combination of circumstances brought many of them together a few days ago in Paris. Montague Roberts, who started on the Thomas Flyer from New York last February, but was withdrawn for the Briarcliff and Grand Prix races, accidentally met the De Dion team while on a brief run up to the capital. M. Autran, who had had charge of the mechanical end of the De Dion car, explained that he had just come in from Vladivostock, by order of the factory.

"Before I left the car," declared Autran, "I turned all our gasoline over to the Thomas car. It is true, as reported by cable, that St. Chaffray sought to corner the gasoline supply of the town in order to command a seat on the Thomas car, but as I had no further interest in the race, the factory having recalled me, I gave up all our fuel to the American."

There are not many kind words in Paris and at the De Dion factory for St. Chaffray, who at the start was so much in the public eye and figured as the mainspring of the trip. According to the statements of the De Dion engineer it was the inexperience and ignorance of the *Matin* delegate that prevented the De Dion car from making a better showing. "St. Chaffray was only capable of driving an automobile under the most favorable conditions. Every time he took the wheel on the bad roads of America he ditched the car. By driving over a steep embankment he broke the frame of the car, and on two occasions unskilful handling was responsible for the breakage of the driving shaft."

On arriving at Vladivostock the De Dion car was sold and is now in the hands of a private owner in Japan.

As if to show that there was no animosity for the beating they had received in the Round-the-World trip, the De Dion officials received Montague Roberts heartily at the factory, conducted him over the huge works and finally presented him to the Marquis de Dion, head of the firm of De Dion, Bouton & Cie., who congratulated the young American driver on his plucky driving in the initial stages of the long trip when it was far from certain that any of the cars would finish.

PARIS SALON WILL THIS YEAR BE TWO SHOWS

PARIS, July 1.—After the lavish pyrotechnic display of the tenth annual automobile salon, Paris is to have an economical era, the first signs of which are to be found in the decision taken this week by the organizing committee to abandon the huge temporary hall on the Esplanade des Invalides. This year there will be two Paris salons, the first one opening on Saturday, November 28, and closing on Sunday evening, December 13, and the second one keeping open its doors from December 22 to December 29. Both exhibitions will be held in the Grand Palais on the Champs Elysées, the initial event being for all kinds of pleasure vehicles, accessories, motorcycles and bicycles. The second show will comprise all classes of commercial automobiles, machine tools, etc., and will close the Paris auto year.

For several years past it has been the custom to hold the Paris automobile show in two distinct buildings, the Grand Palais taking the pleasure cars and some other building the commercial section. As the industrial vehicle grew in importance the greenhouses on the banks of the Seine became too cramped to accommodate the annex, with the result that for 1906 special permission was obtained from the city of Paris to erect a temporary building on the Esplanade des Invalides. The same was done last year, the temporary hall, erected at great cost and pulled down immediately after the show, having a floor area exceeding that of the Grand Palais itself.

It was an expensive matter to put up a temporary hall three times the size of Madison Square Garden, as exhibitors found to their cost. It entailed also the providing of two sets of decorations for those firms, now numerous, who make both pleasure and commercial vehicles; those who have seen the Paris show know how costly the decorations have been in every case.

This year, while there will not be much diminution in the general scale of decorations provided by the organizing committee, exhibitors are recommended to spend less on their stands than they have done in the past, a recommendation that appears likely to be followed. Those firms who are exhibiting at both shows will naturally be able to retain the same decorations for the two events, there being an interval of but eight days between the closing of the pleasure car and the opening of the industrial vehicle show that is scheduled to follow it.

Abuses in connection with the season and press passes are to be brought to an end. In the past free passes have been distributed generously on the opening and popular days of the show. Employees of exhibiting firms are known to have gathered together the greatest number of free passes, and either given them or sold them to their friends. There are quite a number of Parisians, too, who, rather than pay a modest franc for admission, have put in an application for a press ticket, declaring that they were connected with some foreign journal. Such practices will be stopped next year, all passes being made personal, and all members of the press being called upon to prove their journalistic connection before being allowed to take out a card, so that this source of loss will go.

FRANCE RESOLVES TO HAVE A BIG AUTODROME

PARIS, June 30.—Auvergne is resolved to have the first autodrome in France, or, as they prefer to call it here, the closed racing circuit. Immediately after the Gordon-Bennett race of 1905 the mountainous course in Auvergne was proposed as a permanent racecourse, but owing to financial difficulties and the disinclination to give any one region the monopoly of automobile races the matter was not pushed forward by the A. C. F.

For the last three years the Automobile Club of Auvergne has boomed the scheme of a racecourse around the Puy du Dome, and has further studied the financial question. This week the local club invited the Automobile Club of France to the district in order to convince the national body of the practicability of the scheme and to give them an idea of the interest of the neighborhood in a motor racecourse. The Competition Committee, with Marquis de Dion at its head, accepted the invitation, traveled down to Clermont-Ferrand by special train, were taken up to the summit of the mountain by a special local and shown the proposed road on the way, a beautiful view being had.

From the summit of the mountain, 4,800 feet above sea level, a magnificent panorama unrolls itself in every direction. The road which it is intended to use as a motor course runs around the face of the mountain, and is almost all visible from the summit. A small portion of the projected course is the highway on which the Gordon-Bennett race was held in 1905. Though all roads are made and in excellent condition, a considerable amount will have to be expended in barricading them, lighting, and generally fitting for fast automobile work. Clermont-Ferrand, best known to automobilists as the home of Michelin and other tire factories, is at the foot of the mountain and within a short distance are a string of holiday resorts. If the project is accepted by the Automobile Club of France the land within the course will be fitted up for other sports, including cycling, aeronautics and athletic games. One of the objections made to the Auvergne course is its distance from Paris. As the majority of the automobile factories are located around the capital, before any use could be made of the course as a testing ground it would be necessary for cars to make a journey of about 240 miles, which manufacturers naturally consider excessive.

PREPARING FOR WORLD'S ROAD CONFAB.

PARIS, July 1.—Preparations are now well advanced for the international road conference which the French Government will hold in Paris on October 11 and the seven following days. It has been decided during the week of the conference to hold a public exhibition in the Tuileries Gardens showing samples of road, tools and machinery for road making, road signs, etc.—in a word, everything relating to the construction and upkeep of urban and rural highways. Minister of Public Works Barthou has recently taken the further decision to invite all nations to a second conference to run concurrently with the first, at which the question of international road regulations, and more particularly the problem of facilitating international communication, will be discussed at considerable length.

FAMOUS PARIS AUTO AGENT RETIRES.

PARIS, July 1.—C. L. Charley, who is well known both in Europe and the United States as the selling agent of the Mercedes Company, has now severed all connection with the automobile trade. A few months ago Mr. Charley retired from the management of the Mercedes selling house in the Champs-Elysées, Paris, and has this week made a deal with Harvey DuCros, of London, who takes over the remaining stock of the Mercedes chassis, for which the Paris dealer had contracted. At one time M. Charley was a power in the automobile trade abroad, and at the same time he was doubtless the chief moving power in the introduction of the German-made car in the United States, where, through his efforts, it achieved a reputation in a very short time, quite a large number being sold.

THE AUTOMOBILE

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PROGRESS OF THE GOOD ROADS MOVEMENT.

It goes without saying that the Good Roads and Legislative Convention, now being held in Buffalo, will accomplish more to awaken public sentiment generally to the crying need for highway improvement in this country than any single step that has been taken in this direction up to the present. It is the culmination of a number of years of struggling toward the goal for which not alone the autoist, but the farmer, the suburbanite and the city dweller also are bound, for there is no one who is not influenced by the solution of the good roads problem. But while it marks the end of a long struggle, it is only the beginning of a far greater campaign that must be carried on relentlessly for a number of years before the results growing out of the preliminary work can accrue. The good roads advocates have won out in the battle for recognition from State and local authorities, and in the meantime a great deal of actual improvement work has been carried out, but when compared with the hundreds of thousands of miles of roads in the East alone, it must be realized that the task has only been begun.

There is yet a vast educational campaign to be carried on, and here the Buffalo convention is starting the entering wedge, as the practical demonstrations there carried out are on a larger scale than anything of the kind previously attempted. In fact, they represent the most comprehensive showing of methods of road building that has ever been undertaken. Before we can have an extensive system of good roads people who do not know the meaning of the term must be shown how to construct them—not so that they will need rebuilding a few years hence, but so that once in place, with the proper maintenance, they will last for all time. And here again is a vast branch of the subject, road maintenance, on which the demonstrations at the convention should have a very perceptible effect. No matter how well a road is constructed, if it be not properly cared for, its life must necessarily be short, and it is consequently of equally great importance not alone that people be taught how to build good roads, but also how to take care of them. Last but not least, the results of the convention will be felt in the increased sentiment for uniform legislation, for which the A. A. A. is consistently working. There cannot be the slightest doubt that the convention will become an annual fixture henceforth, and that through it the American Automobile Association will be enabled to accomplish many times the good it has done in similar lines heretofore.

* * *

PRESENT TREND OF IGNITION PRACTISE.

Five years ago the magneto was already a well-established part of the equipment of the average foreign car, but it was practically unknown on automobiles built on this side of the Atlantic. European designers had found it simple, practical and dependable to a much greater degree than was the case with the coil and battery system, but as a general rule the American maker would have none of it. Beneath the more or less general prejudice manifested against it, there was the further disadvantage of greatly increased initial cost, whether the high or low-tension system was adopted, and this seemed to militate against it to a greater extent than anything else.

In the past two years there has been an almost complete reversion of feeling on the subject. The American designer has found himself compelled to give the magneto its due, and it seems safe to predict that, within a year or two there will scarcely be a car built that is not thus fitted. The next step is the entire elimination of the battery and coil system, and it is one that Continental builders of light cars have taken some time since, many of the small French cars in particular relying entirely upon a magneto for ignition. An emergency system is always welcome on the car, but where it is a matter of initial cost there appears to be no reason why the magneto should not be the one system selected.

A. A. A. CONVENTION SPLENDIDLY SUCCESSFUL

BUFFALO, July 7.—The first Legislative and Good Roads Convention of the American Automobile Association was called to order by President Hotchkiss at 10 o'clock this morning in Concert Hall, in the Teck Theater Building. Mr. Hotchkiss spoke briefly in welcoming the delegates, and closed by reading an extract from an address of President Roosevelt, delivered at the International Good Roads Congress in 1903, and which had been sent to Mr. Hotchkiss by the President.

Mayor Adam delivered the keys of the city to the convention in an address, in which he paid due tribute to this great city of Northwestern New York, and then spoke briefly of this great work of making bad roads into smooth and beautiful highways. He said, in part:

Speed is a superfluity. Good roads are a necessity. Success in obtaining good roads must rest upon the character of the road to success. I mean the roads of fairness, justice, perseverance and cooperation. These are the highways that lead to ideal good roads. not for the automobility alone, not for the man with the elxsixty, but also for the man with the hand cart. The ueere of roads must be kindly considerate one to another. It should not be a capital crime for a chicken to desire to cross a road. Who knows but deliberate cows are sent especially to test alike our patience and our emergency brake. Gentlemen, you will get the fullest measure of your rights by observing in the fullest measure the rights of others. Let ua have cooperation, let the citiee work with the towns, the automobilist with the farmer. the cyclist with the pedestrian, all working together for good roads. Then, instead of pleasure being a bubble, a bubble will be a pleasure.

The convention then went into legislative session, in charge of Charles Thaddeus Terry. In opening this session, Mr. Terry took occasion to criticize sharply existing motor vehicle laws. He characterized them as "intolerable" and "ridiculous." "Intolerable," said Mr. Terry, "because they retard the progress and development of the automobile and greatly lessens its usefulness. Ridiculous because it is hard to conceive how, within the confines of one nation, so many legislative bodies, supposedly made up of the leading men of the Commonwealths, could enact provisions of law on the same subject so divergent and contradictory, and at the same time absolutely without apparent purpose, except to harass and restrict a certain class of citizens."

The first address, "Federal Automobile Legislation," by Hon. W. W. Cocks, Congressman from New York, held special interest, inasmuch as the Congressman introduced a bill, killed in committee, but which it is confidently expected will pass at the next session at a time when automobile interests will have gathered sufficient strength to see it through.

"The Constitutionality of Federal Automobile Legislation" was next discussed by the Hon. Neil Brown, president of the Wisconsin State Automobile Association.

Following W. C. Crosby, chairman of the legislative committee of the Associated Automobile Clubs of New Jersey, gave his hearers food for thought in his comments upon "Unreasonable State Legislation." This address was well seconded by Walter S. Schutz, counsel for the Connecticut State Automobile Association. Mr. Schutz discussed "Uniform State Automobile Legislation," and brought out its advantages.

The open session, under two-minute rule, developed an animated discussion of the subjects touched on hy the speakers.

What Was Done at the Afternoon Session.

This was called the First Good Roads session, held in charge of Robert P. Hooper, chairman of the A. A. A. Good Roads Board. He told of the progress made in securing favorable laws, and expressed the belief that in a few years it would be possible to motor from Boston to San Francisco along improved highways. The following delivered addresses:

James H. McDonald, State Highway Commissioner of Connecticut, and president of the American Road Makers' Association, sounded the keynote of the convention in his address on "Good Roads." Mr. McDonald argued strongly for a system of national highways, built and maintained by the national government, as is commonly done on the Continent.

Frederick Skene, State Engineer and Surveyor of New York, was scheduled for the next period to talk on "The History and Development of State Highways." Mr. Skene was unable to be present, but his paper was read by Deputy State Engineer Frank L. Getman. This paper was of the nature of an historical sketch of the road system of New York. Prior to 1898 the State had taken no steps toward a systematic improvement of its highways by means of State aid. Between 1898 and 1903, the average cost per mile of improved roads was $7,000. Since that time, owing to the increased width and depth of roads and advance in the price of labor and material, the cost has been $9,000 a mile.

Charles J. Glidden, famous automobile globe-circler, took his hearers along for "Seven Minutes on the Roads of the World," in his usual entertaining manner.

"Drainage and Sub-base of Improved Roads" was treated in masterly style by Horatio S. Earle, State Highway Commissioner of Michigan.

Joseph W. Hunter, State Highway Commissioner of Pennsylvania, told the convention of the "Road Improvements in Pennsylvania," a State that in sections challenges the highest skill and genius of the road builder.

"Road Problems in the State of Illinois" was discussed by A. N. Johnson, State Engineer of Illinois.

L. W. Page, chief of the Bureau of Highways, in the Department of Agriculture, Washington, spoke of "The Effect of Automobiles on Macadam Roads." He showed by illustrations how rapidly moving cars raise dust and loosen small particles of the roadway.

The remainder of the afternoon session was taken up by speakers, who spoke as follows: "Road Problems for Automobilists," by R. D. Beman, Deputy State Highway Commissioner of Pennsylvania; "Maintenance of Improved Highways," by James E. Owen, of the Newark (N. J.) Board of Trade; "The Lincoln Way," by Robert B. Caverly, president of the Automobile Club of Washington, D. C., and "Good Roads and Their Benefits," by William L. Raeder, president of the Board of Trade of Wilkes-Barre, Pa.

To-morrow's session promises to be one of unusual interest, and after its close a banquet will be given at the Hotel Iroquois to the invited guests. The program for Wednesday's session is as follows:

10:00 A. M. Second Good Roads Session—In charge of Chairman Hooper.

10:05 A. M. Reports of Committees and action thereon.

ADDRESSES.

"Federal Appropriations for Road Improvement"—Ex-Governor N. J. Batchelder of New Hampshire, Master of the National Grange.

"New York's Highway Code"—Senator Jotham P. Allds, of New York.

"The New Roads Era in Ontario"—A. W. Campbell, Deputy Minister of Public Works, Province of Ontario.

"The Call for Good Roads and the Propriety and Need of Federal Aid"—F. A. Derthick, Master of the Ohio State Grange.

"Special Road Construction"—A. R. Pardington, of New York, General Manager of the Long Island Motor Parkway.

"The Highways of Massachusetts"—Harold Parker, Chairman Massachusetts Highway Commissioners.

"Improvement of Town Roads"—Stephen Ryan, State Road Director in New York.

"Good Roads and Automobiling from the Farmer's Standpoint"—F. N. Godfrey, Master of the New York State Grange.

"Treatment of the Earth Roads."—D. Ward King, of the Missouri State Board of Agriculture.

"Road Problems of the Pacific Coast"—James W. Abbott, of Nevada, late U. S. Highway Commissioner for the Rocky Mountain and Pacific Coast States.

12:30 P. M. Open Session—Under the two minute rule.

1:00 P. M. Adjournment sine die.

2:30 P. M. Practical Demonstrations on the Williamsville, Transit and Clinton Street roads by automobilee, furnished by the Automobile Club of Buffalo to be taken at ths Hotel Iroquois.

The racing war comes up for much discussion in this gathering of automobilists from all over the country. The pretensions of the New York club to control the sport of racing in this country are generally laughted at. No one seems to care a cent what action the European clubs take.

How the Delegates Gathered at Buffalo.

BUFFALO, July 6.—Delegates to the Legislative and the Good Roads Convention of the American Automobile Association began to make their appearance Sunday, and to-day they are pouring into the city by railroad, steamship, automobile, and trolley. Buffalo is on the eve of the greatest convention of its kind in history, and Buffalo is rising to the occasion with her accustomed vigorous hospitality.

Those arriving are registered promptly at the headquarters of the A. A. A. at the Iroquois Hotel, by Secretary Frederick H. Elliott and his staff of assistants. Those arriving by train and steamship are met at station or docks by members of the reception committee in automobiles and taken to their hotels. Badges and booklets containing the program of the convention and coupon tickets for the various entertainments planned by the entertainment committee are distributed among the visitors as they are registered. The Ellicott Club and Country Club have extended their hospitality to members of the convention while in the city. John L. Clawson is chairman of the entertainment committee and A. H. Knoll chairman of the reception committee in charge of the entertainment of the delegates and visitirs.

Prominent among the first arrivals were: James W. Abbott, of Nevada, United States Highway Commissioner of the Rocky Mountain and Pacific Coast States; Joseph W. Hunter, Highway Commissioner of Pennsylvania, and Stephen Ryan, State Road Director of New York, and H. M. Swetland, of THE AUTOMOBILE. Accompanied by County Engineer George C. Diehl, chairman of the committee on practical demonstrations, they have already inspected the various exhibits of road construction and dust prevention just outside the city.

Robert P. Hooper, of Philadelphia, chairman of the Good Roads Board of the A. A. A., and U. S. Dandurand, vice-president of the Automobile Club of Canada, are also here to attend the convention.

Not only delegates, but visitors as well, have motored to the convention. More than fifty cars have arrived from points in Pennsylvania and Ohio, while touring parties from East and South are coming into the city in large numbers.

The city is a flame of color. Flags and bunting hang everywhere in honor of the thousands of visitors, and while the national colors predominate, the A. A. A. flags, emblazoned with the convention name, proclaim everywhere the object of the gathering. Every automobile in the city carries these pennants.

Three hundred cars will be required on Thursday to convey delegates and guests attending the good roads convention to different points in and near this city, when exhibitions of modern road making and demonstrations of dust-laying methods will consume several hours of the convention's time. As noted on the program, this outdoor feature is a stated part of the convention proper, and it bids fair to be one of the most instructive periods, notwithstanding the intense heat.

Cars will start from headquarters at the Iroquois, transporting the delegates by a long and devious route to, successively: a dust alleviation experiment; a road machine exhibit, showing improved types of apparatii used in the construction and maintenance of good highways; a tarvia treated highway; a Kentucky rock asphalt section; practical demonstrations of vitoviaby road building (one mile being treated); a mile of highway treated with asphaltolene; a section of macadam construction, and as a windup an inspection of a brick country road now under construction.

George C. Diehl, chairman of the committee on practical road demonstration, prepared his part of the program with all attention to detail, and the outdoor session of the convention proved a source of practical education to every motorist and highway commissioner in attendance.

Chairman Diehl laid his plans with care, and through various channels succeeded in developing live interest in over 900 towns in the State by urging the attendance of representative supervisors, town clerks, and justices of the peace. In doing this he outlined the scope and objects of the convention. The crowd of visitors attest the success attendant upon his efforts.

The United States Government is represented by Logan Waller Page, director of the Offices of National Public Roads. Mr. Page was educated in engineering work as applied to roads in Harvard University and later in French colleges.

Governor Hughes has appointed the following delegates to represent the State of New York at the convention: Senators Jotham P. Allds, Henry Hill, George A. Davis, William H. Hotchkiss, and Arthur Warren. This is an emphatic recognition and endorsement of the Good Roads Convention accorded by the state through the presence of its representatives. Other delegates and members of the convention who have arrived are:

E. L. Powers, New York, secretary of the American Road Makers' Association; Will S. Blair, Indianapolis, secretary of the N. P. Manufacturers' Association, appointed as delegate by Governor Hanley of Indiana; Fred N. Root, Kalamazoo, Mich.; Curtis Hill, Columbia, Mo., State Highway Engineer; Pike Campbell, Louisville, Ky., Louisville Automobile Club; Roy F. Britton, St. Louis, trsasurer Missouri State Automobile Aesociation; L. M. Bradley, New York, manager publicity department, American Motor Car Manufacturere' Association; W. H. Chase, Boston, chairman Good Roads Commiselon, Massachusetts Stats Automobile Association; Mark Aitken; A. E. Lerch; and H. E. Marsh, Springfield, Mass., Automobils Club of Springfield; W. H. Heath, Adam Byerly, J. B. Billick, Greenock, Pa.; James C. Wonders, State Highway Department, Ohio; D. W. Seitz, Columbus, O.; Senator J. P. Allds; James T. Drought, secretary Milwaukee Automobils Club and eecrstary Wisconein State Automobile Association; Neal Brown, president Wisconsin State Automobile Association; Frank E. Bogardue, New York, County Engineer; L. W. Page, Washington, D. C.; Mrs. J. H. MacDonald and daughter, Hartford, Conn.; Robert P. Hooper, Philadelphia, chairman of the Good Roads Board of ths A. A. A.; S. Boyer Davis, Philadelphia; Frank G. Webb, Brooklyn; Alfred Wilmarth, Brooklyn; George B. Baird and L. H. Townssnd, Oneonta, N. Y.; W. H. Hager, Cleveland; Frederick H. Huston, Columbus, O.; Arthur L. Stark, Elyria, O.; Asa Goddard, Clsveland; W. C. Thoma, Pittsburg; Dr. E. C. Wagner, Wilkss-Barre, Pa.; Frank H. Nutt, Kokomo, Ind.; Crow Cooley, Minneapolis; C. Gordon Neff, Cincinnati, O.; Charles P. Price, Malden, Mass.; John R. Rabiln, Boston; Lynn White, Chicago; William J. Donnelly, S. D. Bartlett, Edwin H. Lewis and L. E. French of ths Quaker City Motor Club, Philadelpbia; John P. Coghlin, Worcester, Mass.; A. D. Convsrse, Wincheden, Mass.; and John S. G. Dsmont, Bryn Mawr, Pa.

President Hotchkiss Emphasizes Convention's Importance.

That this good roads movement is close to the hearts of automobile owners is demonstrated by the presence of delegates from nearly onc hundred automobile clubs; also by the important places assigned on the program to men high in the councils of state automobile associations. President Hotchkiss, of the American Automobile Association, said in conversation with several newspaper men:

"It is particularly noticeahle that in this convention—which was originally called by the American Automobile Association—are cooperating the National Grange, which at present, with the backing of a million members, is advocating a fifty-million-dollar appropriation from the federal government, througb the Currier Bill, and the American Roadmakers' Association, which, repressnting, as it does, the state highway commissioners and sngineers, ae weil as a vsry large number of road experts throughout ths country, ie particularly interested in securing state aid for good roads.

"Thus, the three great bodies which are most vitally interested in the good roads movement are meeting together at Buffalo, and their meeting will doubtless result in some sort of an understanding that will lead to similar conventione annually, growing larger and more important, until practically all of ths states and the federal government are actively at work, through appropriation, plan and actual construction, in building good roads. Already the city of Cincinnati, through its Convention League, has taken action urging that the next gathering be held in that city."

BUFFALO, July 7.—On this, the eve of the fifth annual contest of the American Automobile Association for the Glidden trophy, the usual condition of excitement reigns; competitors are hourly arriving from the dozen or more factories represented in the list of contestants. Press representatives from the different metropolitan journals are reaching the city on every incoming train, representatives from the several American tire factories have already arrived, and, in short, from all sections of the land are special envoys, representatives of the different phases and departments of the motor industry, all going to swell the great caravan that will, from July 9 to 23, meander its way over 1,670 miles of New England roads under the name of the Fifth Annual Reliability Tour of the A. A. A.

A mile down Main street from the Iroquois Hotel is the Teck Theater Building, on the second floor of which are located the different managers to whom the contestants will look for the successful conduct of the contest. Chairman Frank B. Hower, of the A. A. A. Touring Board, in shirt sleeves, superintends the entire situation; Dai H. Lewis is the *route à confetti* encyclopedia; E. L. Ferguson is busied with the final arrangement of the entries, as well as bringing together the data and forms necessary for the daily dispatch and reception of the cars; Mortimer Reeves has his hands full with the rôle of assistant pilot duties, coupled with those of nightly garaging or parking the cars; F. D. Stadham, chief of the observer brigade, is rapidly perfecting his outline plan for the placing of impartial observers on the cars each day, as well as the permutating of them so that no observer rides on the same make of car, or on a car of the same team, or on a car handled by the same firm as nominated him; H. D. Herr is busied with the hotel accommodations, which include the systematizing of the work under Cook control, as well as the explaining of it to the different competitors; Arthur N. Jervis, the publicity end, is playing the rôle of a complete press room; Nathan Lazarnick, the official photographer, has everything necessary in the line of plates and films; Messrs. Conklin and Carroll, the night watchers, have had their instructions and David E. Hoag, the official physician of the route, has all his plans perfected. It only remains for the cars, drivers and observers to do their parts during the long twelve days of the drive.

Numbers Not So Great—Conditions More Strenuous.

Statistically considered, the Glidden-Hower Tours are not so big as a year ago, but the loss in numbers is more than compensated for because of the fact that those cars entering have done so in spite of the $200 entry fee, in spite of the fact that impartial observers will be carried on each car, and also despite the fact that this year's tour leads through a generally mountainous and hilly district, the roads through which are largely composed of clay and gravel, which, if weather conditions are favorable, will make easy going, but if rains are frequent will result in the hardest kind of work for the contestants. Already twenty-seven Glidden Trophy cars are waiting to be dispatched by Ferguson Thursday morning, all of which will compete in clubs for tbe Glidden Trophy, the twenty-seven being divided among nine clubs, three cars constituting a team, the division being as follows:

Automobile Club of Buffalo, 1st team:
Car No. 1, Pierce Arrow, Charles Clifton.
Car No. 2, Pierce Arrow, Charles Clifton.
Car No. 3, Pierce Arrow, James McGuire.

Automobile Club of Buffalo, 2d team:
No. 4, Reo, R. M. Owen.
No. 8, Premier, R. M. Owen.
No. 9, Premier, H. O. Smith.

Columbus Automobile Club:
No. 5, Peerless, E. H. Parkhurst.
No. 6, Peerless, E. H. Parkhurst.
No. 7, Peerless, E. H. Parkhurst.

Rochester Automobile Club, 1st team:
No. 10, Gaeth, Paul Gaeth.
No. 11, Thomas, Gus G. Buse.
No. 32, Selden, R. H. Solomons.

Rochester Automobile Club, 2d team:
No. 24, Studebaker, E. V. Stratton.
No. 25, Studebaker, E. V. Stratton.
No. 26, Studebaker, E. V. Stratton.

Automobile Club of Syracuse:
No. 12, Franklin, H. H. Franklin.
No. 13, Franklin, John Wilkinson.
No. 14, Franklin, F. H. Stillwell.

Chicago Motor Club:
No. 19, Haynes, Frank H. Nutt.
No. 20, Haynes, Loring Wagoner.
No. 35, Oldsmobile, F. O. Smith.

Bay State Automobile Association:
No. 21, Marmon, Frank E. Wing.
No. 22, Marmon, W. C. Marmon.
No. 23, Marmon, W. C. Marmon.

Cleveland Automobile Club:
No. 29, Garford, A. R. Davis.
No. 30, Garford, A. R. Davis.
No. 31, Garford, A. R. Davis.

It is up to these nine teams to fight out the contest as to which shall be the proud possessor of the Glidden Trophy for the 1908-1909 season. It is apparent from the status of these nine teams that the winner for 1908 will be more of a factory than motor club proposition. Of the nine teams six represent as many individual factories, the makers having this representation being Pierce, Peerless, Studebaker, Franklin, Marmon and Garford. The three mixed teams are the Haynes and Oldsmobile combination in the Chicago Motor Club, the Selden-Gaeth-Thomas combination constituting one of the Rochester clubs, and the two-to-one Premier-Reo team forming the second Buffalo club. Two automobile clubs, namely, the Buffalo and Rochester, have entered two teams, whereas a year ago the Buffalo club entered but one team, which was a combination of varied factory interests. It is expected on every hand that this one factory team situation will add greatly to the interest in the tour, and should one of these teams win it the factory can stand on the ground that its car won the Glidden Trophy, which was an impossibility under the conditions of a year ago. On the other hand, with the three remaining clubs that have mixed teams a different situation rules. Should the combination Rochester team win, Selden, Gaeth and Thomas will each have a third interest in the big trophy; if the Chicago Motor Club carries the winning colors, Haynes and Oldsmobile will divide on a two-third and one-third basis, and should the second Buffalo team be the final winner, R. N. Owen, the entrant of two cars, will have to look after tbe division of honors between Premier and Reo ranks.

A year ago forty-six cars started out to strive for the trophy, and although this year's number shows a reduction of nineteen it is agreed on all hands that interest tbis year will be more than double that in the event of a year ago.

As heretofore, the struggle for the Hower Trophy will be an individual affair, this trophy going to the car having the highest merit marks at the completion. The trophy will be contested for by fourteen runabouts as against thirteen in 1907; of these fourteen two are Pierce Arrows, three Stoddard-Daytons, three Overlands and one each of Franklin, Premier, Gearless, Moline, Reo and Blomstrom.

In addition to this grand total of forty-one in the Glidden-Hower phase of the contest are five entrants that are contesting solely for Glidden certificates, the main reason for these competing under this classification being the impossibility of their getting in a club team. This list includes two Stevens-Duryeas, two Oaklands and a Rainier, the last to be driven by Mrs. Cuneo, who has piloted cars successfully during the previous Glidden tours.

In addition are three non-contesting cars, consisting of a Studebaker *Motor Age* Press car, a Packard Press car and an Oldsmobile entered by C. H. Foster and designated the Gabriel Horn car. Added to these are four official cars, No. 99, Chairman Hower's Pierce Arrow; No. 98, Dai H. Lewis' Premier pilot; No. 97, Mortimer Reeves' Reo as assistant pilot, and No. 96, the Packard Red Cross, under the official direction of Dr. Hoag.

Recapitulating, we have the analysis and relative strength of the 1908 and 1907 Gliddens as follows:

	1907	1908
Glidden Trophy	46	27
Hower Trophy	13	14
Glidden certificates	4	5
Non-contestants	6	3
Officials	5	4
Total	74	53

The entry fees for 1907 at $100 a car aggregated $7,650 and for 1908 at $200 a machine $9,800.

Carrying Out the Preliminary Inspection.

In one regard the change of heart evidenced on all sides by the management in respect to the carefulness of the tour is well exemplified by the inspection of all cars and extra parts carried by them all on Wednesday morning, July 8, at 9 A.M. At this hour all of the contesting cars must present themselves at the official parking place, 757 Main street, where they will be taken over by the Ferguson-Reeves combination. After a cursory examination to insure that nothing but stock models are competing, the program will pass on to the checking-in of the regular spare parts, such as valves, valve springs and other extras regularly supplied by manufacturers at listed prices. The committee has ready heavy canvas bags similar to those employed for carrying mail, in which these parts will be placed and sealed therein by wire with lead seals, an inventory of the parts therein being retained by the committee. In another canvas bag of more than double the size, but of the same design, will be put in all the extra spare parts that the contestants take along, by extra spare parts being meant those not regularly supplied with the car at the list price. An inventory of these parts will be taken and kept by the committee, so that a check-up system can be used periodically with the contents of the different bags. In case contestants carry extra large parts, like springs or steering knuckle tie rods, which cannot be carried in the extra spare part bag, a suitable sealing of these in the car will be accomplished. Tools will be left free, to be carried in their regular boxes, and any use whatever may be made of them on the road without penalty, providing the car maintains its time schedule; the penalization system deals only with the use of new parts which are carried in the regular or extra bags, and the penalty for the use of either is at the rate of one point per dollar, the parts being listed at their regular factory prices. This rule is the same as a year ago, but will work out much better to the different clubs because all of the teams are constituted of three cars, so that the penalty credit to each of the nine clubs will be the same for the same breakage, providing the price of replacement is the same. Last year, owing to the different numbers and the teams, one team of ten cars received but one-tenth point, whereas a similar breakage in another team of three gave the team a penalty of a third point. Any contestant that has to make use of spare parts not carried from the start of the tour and inventoried officially, will be disqualified.

Aspect of the Observer Situation.

Before the completion of the tour the observer proposition will prove the crux of the situation, because on the impartial selection of the winning clubs depends the veracity and faithful performance of duty of these arbiters of the situation. In order that these twenty-seven observers for the Glidden and fourteen for the Hower may start as well fitted as possible for their duties special cards have been issued, on which they will record their daily reports

Scenic Part of the Route Is Very Picturesque.

To Pathfinder and Chief Pilot Dai H. Lewis belongs the honor of the detail selection of the scenic route which the Glidden tourists for this year will follow. While it is essentially an Eastern tour, starting from Buffalo and circling through the New England States to Saratoga Springs, a total distance of 1,669.7 miles, it offers as varied road conditions, as exceptional scenic conditions and as good all-around touring conditions as would be possible to find. During the twelve days of the trip no less than six of the Eastern mountain ranges are traversed; on the third day, on the Pittsburg-Bedford leg of the trip, the Alleghenies are crossed; in the Milford-Albany run, on July 16, the Catskills are encountered; the run from Albany to Boston passes through the Berkshire Hills; two days of the run, namely, Poland Springs to Rangeley and Rangeley to Bethlehem, the White Mountains are traversed, and during the last day's jaunt the Green Mountains are encountered and the wind up made at Saratoga Springs on the foothills of the Adirondacks. A conservative estimate places the mountain and hill touring at 40 per cent. of the trip. There are few of the long, level runs that featured last year's run from Cleveland all the way to Canton and from Baltimore to New York. The first day's run, Buffalo to Cambridge Springs, is over the old St. Louis tour route to Erie, which is a rolling ninety-six miles jaunt, but from Erie to Cambridge Springs is hilly work. The second day's run, from Cambridge Springs to Pittsburg, is hilly, with a little mountain work approaching the Iron City. The third day's run, from Pittsburg to Bedford Springs, is the hardest one of the tour and is not over the same route followed between these places by the Gliddenites a year ago. The route lies further north and leads through more picturesque mountain country and offers extreme touring conditions. The Bedford-Harrisburg run is an easy one, as is the Harrisburg-Philadelphia stage. From Philadelphia to Milford is the most level stage.

Ten Teams Instead of Nine Will Contest.

BUFFALO, July 8.—Thirty cars are now contesting for the Glidden trophy, making 10 teams of three each, the tenth team being made up this morning and consisting of two Oakland cars and Mrs. Cuneo's Rainier, the three going under the color of the Chicago Motor Club, making the second team for this club. This changes the Glidden status in that there remain but two cars running for Glidden certificates, namely, the Stevens-Duryeas. Three extra non-contesting cars have been taken on, making in all 56 cars that will leave Buffalo at 10 o'clock to-day on the first day's run to Cambridge Springs. The three added machines are a second Studebaker press car, a Diamond tired machine, entered by N. E. Oliver, and a Goodrich tired car, entered by W. O. Rutherford. The registration of the 56 cars is Glidden trophy 30, Glidden certificates 2, Hower trophy 14, non-contestants 6, official cars 4, total 56.

"June Bug," with Aviator Curtiss, Winning "The Scientific American" Prize at Hammondsport, N. Y.

"JUNE BUG" MAKES RECORD FLIGHT CAPTURING $2,500 PRIZE

HAMMONDSPORT, N. Y., July 4.—Persistent effort on the part of the Aerial Experiment Association, headed by Alexander Graham Bell, has finally succeeded in landing the *Scientific American* prize of $2,500 for a straightaway flight of a kilometer. This was accomplished by the *June Bug* this evening, the third machine to be built and tried out by the association. The aviator was G. H. Curtiss, who made more than a mile straightaway, then turning and landing easily, the whole flight taking 1:42 1-2. The flight was made under the auspices of the Aero Club of America.

The *Red Wing* was the first machine to be built, under the supervision of Lieutenant Selfridge. On March 12, 1908, it made its first trial, with F. W. Baldwin as aviator. Starting from the ice after a short run, it covered nearly 319 feet. Instead of repairing the *Red Wing*, the association started to build the *White Wing*, under the supervision of F. W. Baldwin.

On May 22, G. H. Curtiss accomplished 1,017 feet in nineteen seconds, the longest public flight up to the time that had ever been made in America. On May 23, J. A. D. McCurdy essayed to make the flight, and he accomplished 600 feet. The landing proved disastrous. Shortly after the *June Bug* was built, all three being alike.

On June 21 the first flights were made, the first of 456 feet at 28 miles an hour, the second at 411 feet at 31 1-2 miles an hour, and the third at 1,266 feet in 25 seconds, or at the rate of 34 miles an hour. The next flight was of 2,175 feet, taking 41 seconds, 36 miles an hour. On the same day Mr. Curtiss accomplished the record flight of 3,420 feet in 60 seconds.

BALLOON RACE PROVES EXCITING AND MAKES NEW RECORD

CHICAGO, July 5.—By landing at West Sheffield, Quebec, about 60 miles east of Montreal, the *Fielding-San Antonia*, after a 24-hour flight of 895 miles, proved to be the winner of the balloon race held by the Chicago Aeronautic Club. Of the nine big globes that started from the Windy City yesterday afternoon, the one to make the closest approach to Dr. Fielding's flight was the *Illinois*, which landed at Picton, Ont., with 545 miles to its credit, while the *Chicago*, C. A. Coey's monster gas bag, which is larger by one-third than anything ever seen in this country, got as far as Atwood, Ont., covering 522 miles. Dr. Fielding claims to have exceeded the *Pammern's* flight of 876 miles.

Judging from the string of mishaps that befell the competitors, proximity to a large body of water is not a favorable element in the characteristics of a starting place for a balloon race, so that Chicago proved not to be well situated in this respect. The cold air from Lake Michigan proved detrimental to the hopes of the majority of the contestants by greatly contracting the contents of the huge bags and came near ending fatally for two of them, the occupants of the *Ville de Dieppe*, the French entrant. Col. A. E. Mueller was its pilot, assisted by George Schoenck, a fifteen-year-old boy. It was said that the balloon was in no condition to undertake such a test, but its pilot determined to start anyway. The wind carried it over the lake, and the drop in temperature caused it to fall to the surface, compelling the aeronauts to sacrifice everything in the basket, but despite this the balloon continued to drag along the water and threatened to be forced under by the wind at any moment. After having skimmed along in this manner for about ten miles, a warm current of air was struck and the balloon immediately shot up several thousand feet. Without instruments, food or clothing, Mueller came to the ground near Benton Harbor, Mich.

The cold air also came near dropping the *Illinois* into the lake, and so much ballast had to be sacrificed that its chances were spoiled, while the *American*, which made 402 miles to Carsonville, Ont., also suffered from lack of ballast, and had to sacrifice gas. The *King Edward*, Canada's representative, also took to the water once or twice, and had scarcely anything portable left after crossing Lake Michigan, while the *Cincinnati's* occupants descended to assist the *Ville de Dieppe*. The competitors finished as follows:

Balloon.	Place of Descent.	Distance. Miles.	Time. H.M.
Fielding-San Antonio,	West Sheffield, Quebec	895	23 15
Illinois,	Picton, Ontario	545	16 34
Chicago,	Atwood, Ontario	522	14 48
American,	Carsonville, Mich.	402	13 40
United States,	Pinkerton Station, Ontario	388	11 42
Cincinnati,	Covert, Mich	350	9 33
King Edward,	Port Huron, Mich	335	8 03
Columbia,	Clinton, Ontario	276	8 26
Ville de Dieppe,	Lake Michigan	65	6 02

MIDSUMMER DOINGS OF THE AUTO CLUBS

MEDIA CLUB HELPS GOOD ROADS ALONG.

MEDIA, PA., July 6.—The Automobile Club of Delaware County has advised the road supervisors of Springfield township that it is prepared to turn over to them the sum of $1,000 as soon as operations are begun in the repair of the old Baltimore pike. The club, although less than 20 months old, has nearly 200 members and its donations this year to the good roads cause total nearly $1,200.

The club has sent text-books on the construction and maintenance of roads to every commissioner, supervisor and borough council in the county. In a letter accompanying these text-books attention is called to the regulation forbidding the placing of loose stones in the road for traffic to grind down, and that failure to use a binder and to roll render supervisors liable to prosecution, something not commonly known heretofore.

The club is preparing to combat the speeding practice. Warning signs will be erected along the Chester and other pikes, and in a circular letter to members anent this subject, President Weeks, among other things, says:

We have agreed to break up speeding in the boroughs. In some places we are to furnish signs, others are satisfied with our guarantee that we can stop it by this method: First, a warning letter to all our members; second, that we establish our own traps on an 18-mile basis and send our officers from place to place and prosecute every man—member or not—who exceeds 18 miles in the towns. By this plan we can maintain a rational, sane use of the roads through boroughs; otherwise they will hold us to the 10-mile limit.

BOSTON CLUB'S ANNUAL OUTING ABANDONED.

BOSTON, July 6.—The annual outing of the Bay State Automobile Association, which was scheduled to have been held on the 4th and 6th, at Newcastle, N. H., was abandoned owing to lack of interest. The touring committee was late in getting its plans made for the trip and consequently many members had already made arrangements for private trips over the holiday and Sunday. Furthermore several members are leaving to-morrow for Buffalo.

The touring committee does not propose to be caught the same way in its fall event and announcement has just been made that in September the association will conduct a club run and twenty-four hours endurance contest from Boston to the White mountains and return. The committeemen have a plan under consideration which they believe will interest private owners, dealers and manufacturers.

About the middle of the month the association will move into its new quarters in the Carleton Hotel on Boylston street. It will there welcome the Glidden tourists who are to spend Saturday and Sunday, July 17 and 18, in Boston. Extensive plans are being made for the entertainment of the visitors. They include a trip to Nantasket by harbor boat on Saturday, a dinner Saturday night, another harbor trip Sunday and an outing to Lexington, Concord and other points of interest.

COLUMBUS CLUB GIVES ORPHANS A TREAT.

COLUMBUS, O., July 2.—The Automobile Club of Columbus gave the orphans of the city an outing at the East End Country Club on June 26. Through the courtesy of practically all owners of machines here they were enabled to give a full day's enjoyment to about 1,500 little ones. The committee in charge of the outing was made up of Roy D. Williams, Dr. O. H. Sellenings, Dr. George P. Stephenson and several other members who served as directors of the entertainment features.

The Automobile Club of Columbus was reorganized in April and since then a consistent effort has resulted in the establishment of the club on a firm basis and at this time the membership is strong and growing. Club runs are given at intervals and so far they have proved successful in all respects.

MONTREAL CLUB MAKES APPEAL TO DRIVERS.

MONTREAL, QUE., July 6.—At a recent meeting of the Automobile Club of Canada, held this week, complaints were received regarding the non-observance of the rules of the road by both motorists and drivers of vehicles. After a thorough discussion of the matter the directors decided to make an appeal to drivers to give the matter their attention. Many drivers in Montreal make a habit of passing street cars on the side on which people are getting out. The directors deplore the action of certain motorists who offended in this manner in going to and from Blue Bonnets during the recent meet of the Montreal Jockey Club, which attracted a very large crowd.

A suggestion that permission be applied for to use automobiles on Mount Royal was then discussed but was not adopted. It was decided to place route signs and cautions on the road between Montreal and Rouse's Point. This will be a great benefit to those who frequently run from Montreal to New York. Part of the road between New York and Rouse's Point has already been placarded for the tourist's information.

It was also decided at the meeting that the club should take the initiative in abating the dust nuisance on the Longue Point Road. A new composition of oil to lay the dust will be used. The members of the automobile club hope that in the near future they may be able to interest the Turnpike company in the matter, but until then the club will bear the expense.

HARTFORD CLUB ADOPTS OFFICIAL EMBLEM.

HARTFORD, CONN., July 6.—The Automobile Club of Hartford has adopted a club emblem which is to be carried on the radiator spout. It is, in fact, the club button enlarged. The design is that of a spoked wheel and tire. The words "Automobile Club of Hartford, Hartford, Conn.," are in a circle on the tire. The background is brass with blue enamel. The emblem can be readily detached if desired and applied to the dash. After much discussion it was thought best for the sake of individuality to adopt something that could be carried on top of the cooler spout and yet be ornamental.

The club is erecting durable road signs for the convenience of tourists covering all roads out of the city, up to a distance of 25 miles. They contain information concerning distances, curves, grade crossings, and bad roads. The signs are made from heavy gauge strip steel, exhibiting an arrow. Distance is indicated by the point—the name of the town is on the shaft and the club's address on the tail. Other information is shown on the body of the board. The color scheme is blue and old gold, the recently adopted colors of the Hartford Automobile Club. The signs are being erected on wooden posts.

QUAKERS TO ENTERTAIN A. A. A. TOURISTS.

PHILADELPHIA, July 6.—The Quaker City Motor Club is making elaborate preparations for the entertainment of the Glidden tourists who are due here on the 14th. The club has secured permission to use the city hall plaza as a parking place for the tourists' cars during their overnight stay here and a strong guard of police will see that they are not molested during that time. The stag smoker to be held in the ballroom of the Hotel Walton promises an entertainment for the tourists of more than ordinary excellence.

The club has posted a notice warning members and others that Stenton avenue, between Germantown and Chestnut Hill is being patrolled by time squads. This broad level highway is on the direct route between Philadelphia, Reading and Harrisburg, and proves a dire temptation to the speed-inclined. A number of arrests have been made and so the warning advises, "go slow and toot."

LOCOMOTIVE CO.'S CONTRACT TERMINATED.

PROVIDENCE, R. I., July 6.—On July 1, the three-year agreement of the American Locomotive Automobile Company with the builders of the Berliet, at Lyons, expired by limitation, and the Providence makers will henceforth discontinue the use of the word Berliet altogether. In this connection an important announcement is made to the effect that the separate existence of the American Locomotive Automobile Company has also come to an end and that it is now part of the parent company, the American Locomotive Company. Concerning these changes, Vice-President Ball, of the latter said: "The American Locomotive Company, having acquired all of the stock of the American Locomotive Automobile Company, has, for corporate reasons, absorbed that subsidiary company with several others which have heretofore led separate existences. The policy, therefore, is not one affecting the automobile company solely. The automobile business will be continued at the works at Providence, in the garage at 1886 Broadway, New York, and in the agencies in the various cities in the country on a larger scale than ever. Besides continuing to make, under the Locomotive name, its line of touring cars, the company has in prospect a business of considerable proportions in the production of cabs and trucks. There will be no radical change of design in the cars with the dropping of the name Berliet, but it will be possible to make certain modifications of the French design that are desirable for American use. The personnel of the organization of the automobile department will remain unchanged, James Joyce, assisted by R. B. Van Dyke, having charge of the New York offices; Charles E. Davis continuing as superintendent of the factory, and B. D. Gray as designer and chief engineer of the company.

FORD TO BUILD MAMMOTH FACTORY.

DETROIT, July 6.—As a fitting commemoration of its fifth anniversary, as it was organized June 16, 1903, comes the announcement by the Ford Company that it will immediately begin the work of erecting what will easily be the largest automobile plant in this country, if not in the world. The main building will be 865 feet long by 75 feet wide, four stories high—the largest building under one roof in the State of Michigan. It will be built throughout with reinforced concrete, glass and steel—fireproof in every particular.

The total floor space of this building is 258,000 square feet—a mile of floor fifty feet wide—six acres of floor space in the one building. It will contain 13,400,000 cubic feet of space. The glass in the windows totals 52,453 square feet—enough to make a strip one foot wide ten miles long. For heating the building, 58,000 feet—eleven miles—of pipe are required. The Ford Motor Company owns sixty acres of land and the complete plans contemplate utilizing the entire tract for the new plant. It is the old Highland Park race track property, and includes a mile track, which will be used for testing. When finished—and the work is to be rushed through—every part of the Ford cars will be manufactured there, from bolts to cushions, giving employment to 5,000 men, and an output of 500 complete automobiles per day. Alfred Kahn, well known as the architect of the Packard, the Thomas Buffalo and Detroit, the Garford and the Pierce plants, has been selected for the new Ford factory, and it goes without saying that in the arrangement of its facilities for the rapid manufacture of parts and the assembly of cars, the new plant will be a model of its kind.

AKRON GETS AUTO FIRE FIGHTING MACHINES.

AKRON, O., July 6.—After a trip to New York, Rochester, N. Y., Boston, Fall River and Springfield, Mass., Fire Chief John T. Mertz and the members of the board of safety, E. C. Housel and C. C. Benner, decided that self-propelled fire apparatus should be used in this city as soon as it could be introduced without throwing out present satisfactory apparatus. As a result announcement was made that bids would be received July 1 for three auto combination hose trucks. Mr. Housel stated that in time autos will take the place of horses in all of the fire companies of the city—seven stations in all. "The hills of the city will constitute no hindrance," he stated, basing his decision on what he had seen in Eastern cities.

The specifications for the new auto trucks provide that they be of 40 horsepower and have a speed of 25 miles an hour on the level and 15 miles up a ten per cent. grade. Each machine is to have four cylinders, air-cooled, gasoline power and vertical pipes. The wagons will carry one 40-gallon chemical copper tank across the front of tbe hose body, 250 feet of chemical hose and a capacity for 1,000 feet of 2 1-2-inch cotton fore hose. One of the wagons will carry a 20-foot extension ladder and the other two 20-foot extension ladders. They will also be fully equipped with axes and other similar apparatus, so that there will be nothing lacking for the business of fire-fighting when the power-driven machines reach the scene of action.

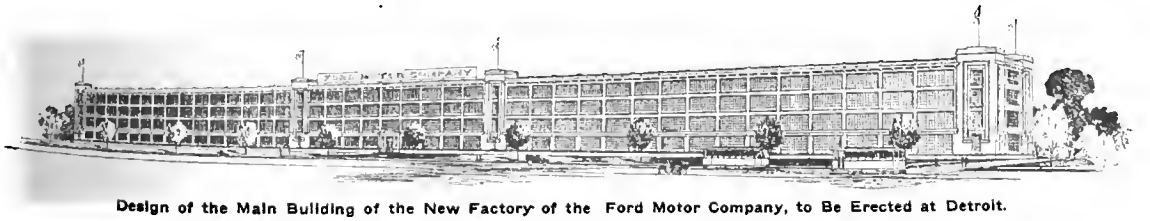
Akron claims to be the first city in the entire country to have an automobile police patrol and expects to be among the pioneers in installing "horseless" fire apparatus.

MAXWELLS NOT TO ENTER A. A. A. TOUR.

This year's A. A. A. tour will perhaps be the first one in which the Maxwell-Briscoe Motor Company will not take part. "From its inception we have been enthusiastic supporters of the Glidden tour," said Benjamin Briscoe, "not from any altruistic motive, but because the tour gave us a chance to demonstrate the efficiency of a moderate-powered and moderate-priced car as compared to the performance of the high-powered and more costly vehicle. And, as a rule, when it came to counting the heads of successful competitors in Glidden tours, Maxwell cars have been found well in the front rank. But the decision of the touring committees to place a handicap upon the lower-priced cars may be well enough for some, but is all wrong for Maxwells. It is just possible that we shall have a sort of Glidden tour of our own, with enough extra strenuosity thrown in to prove that Maxwell cars, in spite of their low price, or perhaps because of it, require no handicap."

SETTLING THE OLD AEROCAR TANGLE.

DETROIT, July 6.—Creditors of the defunct Aerocar Company, against which bankruptcy proceedings were recently instituted, are proceeding against A. Y. Malcomson, ex-president of the concern, for a settlement. He held $204,000 worth of the stock of the company and has filed a claim against it for money advanced amounting to $92,000. The liabilities of the company total $300,000 and the sale of its plant only brought $100,000, so that if Malcomson's claim is allowed, there will be practically nothing for the creditors. Action has accordingly been begun to compel him to pay the difference between the face value of the stock he holds and what he actually paid for it.



Design of the Main Building of the New Factory of the Ford Motor Company, to Be Erected at Detroit.

The Premier Takes Some Real Bears Auto Riding.

SOME UNUSUAL PASSENGERS IN A PREMIER.

It is not often that bears are treated to a ride in an automobile, even though they do happen to be of the trained variety, but this was the case of a Premier "45" car recently, as is strikingly shown by the accompanying photograph. And their bearships seem to be enjoying the situation quite as much as their trainer and the spectators which the unusual sight has attracted to the scene. Fortunately they were well-trained bears and acted like perfect ladies—or gentlemen—should under similar circumstances. Her bearship in the front seat did not attempt to hug the driver, nor did her partner in the tonneau take any-like liberty.

BOSTON GETS THOMAS TAXICAB SERVICE.

Boston, July 6.—Fifty of the new Thomas taxicabs have been received by the Taxi Motor Company, which has its headquarters in the Motor Mart Building, with numerous substations round the city, and W. P. Barnhart, the company's manager is now giving the Boston public the cheap taxicab service that other cities have been enjoying for some time past. The rates are 30 cents for the first half mile and 10 cents for each half mile thereafter, or an equivalent charge of 10 cents for each six minutes waiting. The cabs are the product of the E. R. Thomas Company, Buffalo, and are equipped with French taximeters. It is the intention of the Taxi Motor Company to increase the number of cabs in service to 150 should conditions warrant it.

GOVERNMENT LOSES TIRE IMPORT CASE.

Washington, D. C., July 6.—The government has again appealed in cases of the Auto Import Company, Archer & Company, and Massenat Deroche against the United States, recently decided adversely to the government.

The plaintiffs imported automobiles with tires accompanying that had not been attached in a way to render them capable of immediate use—being interchangeable and might or might not be used on machines with which imported.

The court held that the tires and machines did not togetber constitute an entirety, but were dutiable as though imported independently.

The court further held that in order that merchandise that is distinctively a manufacture of one material, as a rubber automobile tire, shall be classified as a manufacture of another material, as an automobile in chief value of metal, it is necessary that the entire article manufactured should have existed as an assembled entity, so that it would be an invasion for the foreign maker to break the entity into fragments and expect each fragment to be treated as if complete in itself. But where an article has never been assembled abroad, it ought not for tariff purposes to be treated as if it had been so assembled.

POPE COMPANY'S CREDITORS GET DIVIDEND

Hartford, Conn., July 6.—The receivers of the Pope Manufacturing Company will pay 25 per cent. on approved claims, made conditional upon the receiver's receipt of $50,000 for American Wood Block stock, an asset of the Pope Company, and now in hand. The receivers must deposit $65,000 with the Court of Chancery, subject to further order of the court for future partial payment of claims of the lessors of the Chicago property occupied by the Pope Company.

The court further placed the International Trust Company, of Boston, on the same footing with the other creditors. This bank held on deposit certain funds of the Pope Company. It also had outstanding notes against the company. The court refused to sanction the action of the bank in applying the funds on the notes and the receivers will deduct from the trust company's dividend the amount on deposit at time of commencement of the receivership several months ago.

The Pope Company has $400,000 on deposit in Newark. The estimated indebtedness is $1,600,000, and so the $400,000 will just pay the 25 per cent. referred to above. More will be paid late, and it is probable that the company will emerge from its difficulties within the next year or so.

Automobile Engineers Visit Cadillac Plant at the Invitation of H. M. Leland.

Although not originally down on the program of the Third Annual Summer meeting of the Society of Automobile Engineers, held in Detroit the last week in June, one of the most interesting events of the three-day session was the visit to the plant of the Cadillac Motor Car Company, at the urgent invitation of Manager H. M. Leland, who is shown in the accompanying photograph seated with President Fay of the Society in one of the Cadillac cars provided for transportation. This is a runabout and is at the left-hand end of the line. Mr. Leland provided guides for each group of five from the technical staff of the Cadillac plant, so that its entire workings, as well as the details of the foundry situated in another part of Detroit, were thoroughly shown in the course of a few hours.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

To meet the increased demand for finished valve stems and similar work, the Electric Welding Products Company, Cleveland, O., has just installed a grinding department, the equipment consisting of Brown & Sharpe and imported machine grinding tools.

Confidence in the ability of the Truffault-Hartford shock absorbers to save springs is shown by American designers of racing cars, as both the American entries for this classic—the Acme Sextuplet and the Chadwick Great Six stock car will include them in their equipment.

General Manager H. E. Walton, of the Midland Motor Car Company, of Moline, Ill., was in New York the greater part of last week, making a stop in the metropolis in the course of a round of the Midland agencies in the East, including Philadelphia, Boston and other important centers.

To uphold the claims of their basic patents, Spare Motor Wheel of America, Ltd., have filed suit against the Burrowes Screen Company, of Portland, Me., in the United District Court. The spare wheel is coming into extended use in this country and the pioneer firm in this line intends to protect its rights.

The American Motor Car Manufacturers' Association has been advised by Consul W. Maxwell Green, of Hamilton, Bermuda, that the act prohibiting the use of all motor cars in the colony of Bermuda, and to be in force indefinitely, passed both houses of the legislature, and has received the signature of the governor.

The Rambler claims for increased efficiency through the offset crankshaft and straight line drive seem to be substantiated by the twelfth consecutive Rambler hill-climbing victory at Pocono Summit recently, in which a Rambler driven by W. H. Pierce won the event for stock cars of 15.1 to 24 horsepower in 1:16 3-5.

McClay & Black of Los Angeles, a concern that does a large rental business, have kept an interesting record of tire costs and their experience shows that they have been able to average 7,000 miles for every one of the Diamond tires used, despite the fact that they are all on seven-passenger cars and are not given the best of consideration by any means.

A team of three Studebaker Model H, 30-horsepower cars has been entered for the A. A. A. tour through the Rochester Automobile Club. This will be the premier appearance of the Studebaker in the Glidden tour. They will be in charge of Frank Yerger, manager of the Studebaker Philadelphia branch. In addition, another Studebaker will do duty as a press car.

The remarkable performance of the Diamond tire equipment of the Studebaker train of five cars which carried delegates from Chicago to Denver for the Democratic convention is a matter that is arousing no little comment. Every one of the original Diamonds that started on the long run to Denver arrived intact at the latter city, the only delays consisting of four punctures.

As a preliminary try-out the red, white and blue Peerless team of cars entered for the A. A. A. Reliability tour, made the run from Cleveland to Bedford Springs and back last week. The cars will be in charge of Charles H. Burman, who will drive the first with Charles Roth as mechanic; W. C. Straub will pilot the second with Robert Achoff to assist him, while the third will have H. D. Savage at the wheel and J. B. Broch beside him.

The engine of the Acme Vanderbilt racer is now about ready to set up and place on the testing blocks. While work on the engine has been going forward under the direction of Designer Hardy, the frame and running gear is being put together. It is now stated that the car will be on the roads and under stringent road tests by August 1. The question of a driver has not yet been settled, although it is probable that the Acme will be in charge of Jere Price.

At the New York *Globe's* outing held June 28, the Franklin taxicab, loaned by Manager W. S. Jewell and which has just made its appearance in the metropolis, was put to the test. On account of the shortage of cars to transport the 100 employees, it was forced to do double duty, carrying a load of nine. This was done without inconvenience, the run to and from Elmwood, L. I., being made on schedule time. A Franklin truck was also pressed into service, being converted into a modern sightseeing vehicle.

Following their recent successful reliability run, the Indianapolis Automobile Trade Association is planning a similar two-day event. This run will include French Lick, and will be held some time early in the fall. Practically the same rules that governed the one-day run on May 20 will apply to the proposed run. On the latter, 19 out of the 37 cars that started finished with a perfect score. In the two-day run there will probably be a class for trucks, as a 12-passenger Rapid Pullman made the previous run with a perfect score.

Many autoists would be glad to invest in larger tires for their light cars, were it not necessary to also purchase larger wheels. Morgan & Wright have met this demand by bringing out a 31 by 4-inch Universal Dunlop, which fits a 30 by 3 1-2-inch Midgley rim, and a 33 by 4-inch Dunlop tire to fit a 32 by 3 1-2-inch Midgley rim. They are especially recommended for use on the rear wheels. The 40 by 4-inch regular clincher type of M & W make which is being turned out for a few special cars is said to be the largest pneumatic tire made in this country.

While S. Greenwald, of the Greenwald Rubber Company, Buffalo, N. Y., was compounding some rubber in the laboratory of the firm's plant recently, an alcohol lamp exploded and the fire spreading, the offices and factory were completely burned out. Mr. Greenwald was burnt, but not seriously. Considerable loss to the plant was sustained owing to the fact that it was not covered by insurance. The work of rebuilding and remodeling on a larger scale in order to double the company's former output is already under way and deliveries will be made within little more than a week after the fire.

Dr. A. H. Heaton, president of the Sedalia (Mo.) Automobile Club, who started out to show that an automobile tour of Europe could be made in a Ford runabout for $4.68 per day, finds by the expense account of his first week's running that this figure was too high, as the expense per day for the first seven days averages but $3.08, including the cost of an extra inner tube, which added $4.40 to the account. Dr. Heaton speaks enthusiastically of the manner in which the little Ford performs, and adds that the above figures, including putting up at the best hotels, such as the Hotel Beausejour, Lyons, the Grand Hotel Monte Carlo, etc. The biggest item on the week's bill was "hotel, tips and laundry, $25.45," and the next was "gasoline, $12.47."

A prediction made by an officer of the Diamond Rubber Company last December, was that even though the automobile business in general for 1908 might be much smaller than in 1907, the accessory manufacturers would have an active year. Time has more than confirmed this prediction, and it is interesting to note how correct the forecast has been in regard to the business of the Diamond tire people. Since March, the Diamond factories have been working to their fullest capacity, and the daily tire production was never so large as it has been during the past three months. A notable feature of the demand is the increase in the call for the quick detachable type, which has thus far prevented the Diamond Company from moving the Marsh rim factory from Columbus, O., to Akron, as will ultimately be done.

"We have received so many letters bearing on the subject of price-cutting that we find it necessary to issue this general statement prior to giving each letter individual attention," says the Goodyear Tire Company, Akron, O. "The meeting held by tire manufacturers May 21 resulted in the perfection of an organization and the presentation of plans for remedying the price-cutting evil, which will require some time and further meetings to thresh out. Pending concerted action on the part of the tire manufacturers, we have worked out a little plan of our own which will enable those selling Goodyear tires to meet the present conditions and make a profit on all sales. The greatest obstacle to profit-making at the present time seems to be the action of price-cutting jobbers in quoting consumers the same prices that most dealers are compelled to pay." In connection with the foregoing statement, the Goodyear company is requesting the cooperation of the dealers in preventing price-cutting.

John Willys, president of the Overland Automobile Company, Indianapolis, Ind., was the host at an informal luncheon given at the Marion club in that city recently. It was one of those delightful affairs that keep every man guessing as to just why he happened to be there, and the fourteen who sat down were kept in a state of mental suspense on this point until the postprandial ones got busy. C. G. McCutcheon of the American Distributing Company did his best to figure it out according to the integral calculus, while P. D. Lewis, of the Lewis Spring & Axle Company, tried the infinitesimal interim, but neither succeeded in figuring why $x = lunch$. There were several other "little parts" men who are in the habit of selling coils, radiators, axles and the like, but none of them divined Johnny's "motive." It remained for Frank Barnett of THE AUTOMOBILE and *Motor Age* to discover that Johnny was in a quandary himself, his problem being, "Why do parts men stand hotel lunches to customers?" On figuring the number of lunches he had eaten but not paid for, since making contracts for 1909 Overland parts, he was staggered

at the total, and on dividing it by 2,000—the number of Overlands he expects to turn out, he discovered that it amounted to $0.0183 per car. In future, he will buy his own lunches and feed the parts men besides.

H. S. Firestone, president of the Firestone Tire and Rubber Company, Akron, O., when asked the reason for the remarkable growth of this company during its career of eight years, said: "I attribute our success to our early recognition of the value of the highest quality of materials in rubber tires. At the start we adopted the policy of making tires only of the highest grade, and never have we even been tempted to decrease the quality by the use of cheaper material. An additional reason is the concentration of our efforts towards the betterment of rubber tires in general and Firestone tires in particular. We have worked longer on one idea that would improve tires generally than some manufacturers would spend to improve their own individual product only. In the present large factory are installed only the latest and most modern machines for the manufacture of rubber tires. Every convenience and improvement for the making of perfect tires is there. The attention of the company was first directed to the manufacture of solid tires for automobile trucks, and they were among the first firms to manufacture successful tires for vehicles of this class. The remarkable success achieved in the manufacture of solid tires was so gratifying that they decided to enter the pneumatic field.

NEW AGENCIES ESTABLISHED.

Sidney A. Bean, general sales agent for the Autocoil Company, announces the opening of the Detroit office at 730 Woodward avenue, where W. S. Austin will be in charge. Mr. Austin has been connected with the engineering department of the Autocoil Company for a number of years.

Levy & Fanning, Chicago, have just closed negotiations to handle the Chalmers-New-Detroit $1,500 car, which has been creating such a sensation, as well as the Chalmers-Detroit-Forty, in that territory. A new item in connection with the building of the smaller car is the company's frank statement that the factory cost of the motor is $261.

PERSONAL TRADE MENTION.

A change in the partnership existing between H. A. Rowan, Jr., and William A. Blair, who operated the Aldine Garage, at 2028 Sansom street, Philadelphia, under the firm name of H. A. Rowan, Jr. & Company, was announced last week, when Mr. Blair withdrew from the firm. Mr. Rowan will continue the business alone.

George W. Hipple, who has been a prominent figure in the sales end of the industry for several years past, has given up the Chicago representation of the Chalmers-Detroit Company, and will henceforth act as traveling representative of the latter concern, Levy & Fanning having contracted to handle this firm's output in Chicago.

L. E. Hoffman, southern traveling representative for the H. H. Franklin Manufacturing Company, Syracuse, N. Y., has just returned from a six-months trip, during which he placed agencies in a number of Mexican cities, besides Madeira, Yucatan, and Habana, Cuba. At New Orleans, he found a Model D Franklin awaiting him, in which he made a 17,000-mile trip, covering every Southern State except Tennessee and ending his trip at Philadelphia last week.

NEW TRADE PUBLICATIONS.

Gemmer Manufacturing Company, Detroit, Mich.—Gemmer steering gears for motor vehicles is the raison d'etre of the booklet just sent out by this firm, and it gives considerable information of value to the designer in brief form.

Manhattan Electrical Supply Company, New York.—Buyers of ignition supplies will be interested to know that the Manhattan Electrical Supply Co., 17 Park Place, New York, have just issued a 12-page folder showing the line they manufacture, including spark coils, switches, battery connectors, etc. A thoroughly revised edition of their pocket-size catalog—168 pages—"Something Electrical for Everybody," is also ready for distribution and can be had by mailing a postal to the above address.

Cameron Car Company, Beverly, Mass.—Text is subordinated in this instance to the numerous illustrations of the various models of Cameron cars, of which this company is the builder. Each one is attractively pictured on a separate page, and the corresponding specifications printed below it. Illustrations of the complete chassis, power plant and the special Cameron type of sliding change speed gear are also given, with a brief description, the catalogue being an excellent example of compactness and brevity.

Chase Motor Truck Company, Syracuse, N. Y.—Commercial vehicles equipped with two-cycle gasoline air-cooled motors form the subject of a catalogue just being sent out by this firm, and as is consistent with the nature of the vehicles, their description and illustrations are of the plain, business-like kind. A novelty not often found included in the catalogue of makers of such cars, is a gasoline-driven lawn roller, its power plant consisting of a two-cylinder, two-cycle, air-cooled motor, the change-speed gear being of the planetary type, giving two speeds forward and reverse, while the steering and control are the same as on an automobile.

Borbein Auto Company, St. Louis, Mo.—"Catalogus No. 8, Automobile Parts and Running Gears" is the latest piece of advertising literature received from this concern, and its increased size as compared with its predecessors of former years gives ample indication of the growth of its sponsors during that time. It is a 70-page booklet in a dark red cover and is entirely devoted to auto bodies and running gears, together with parts, all of which are fully illustrated and described. Some of these are axles, sprockets, chains, wheels, forgings for levers, pedals and the like and a number of similar lines, all of which are carried in large variety by this house.

Witherbee Igniter Company, New York City.—The first issue of the latest addition to the numerous house organs bears a striking cover in the shape of an illustration depicting part of a honeycomb with the bees at work, the whole being done in color, while across the top is the title of the new publication, "The Wither-Bee." It goes without saying that it is devoted to Witherbee ignition and ignition specialties, from spark plugs and cabls up through Witherbee igniters, or storage batteries, to the new Volta high-tension magneto. This first issue is very attractively printed and illustrated on heavy calendered paper and is not entirely given over to business, as it contains a short story in addition.

Adam Cook's Sons, New York City.—"Albany Grease" has been on the market so long that its name has become a byword among machinery users the country over, so that a little pamphlet with this title and the well-known trade-mark of its makers strikes one as familiar at first sight. In addition to explaining the various uses of Albany grease and the various grades, together with the purposes for which they are specially adapted, the line of special grease cups gotten out by this firm for use with their lubricants is illustrated and described. The different grades of greass to be used on automobiles in summer and winter are also outlined. The work is a little brochure slightly larger than vest-pocket size and is attractively printed and illustrated.

Mayo Radiator Company, New Haven, Conn.—This is a very attractively gotten up booklet in which there is probably less type matter than is usually consumed in the Foreword of the average catalogue, even though it be a very small one, for there are only a few lines of type in this whole work, yet it tells its story very effectively. Its title is "Automobile Radiators," and each page, which is printed on one side only, bears a photographic reproduction of the type of radiator made by this firm for some of the well-known cars, with a few words of description, such as "Type E Locomobile, 1906, 7, 8.," such well-known names as Stevens-Duryea, Pierce Arrow, Premier, Pennsylvania, Stearns, Marion, Simplex, Cleveland and a number of others being shown by these plates.

International Time Recorder Company, Endicott, N. Y.—"Time" is the significant title of a very attractively made up little magazine that is being issued in the interests of this firm. The March number shows it to be one of the most interesting publications of its kind now in existence, as many of the articles are from experienced contributors in the handling of time-recording devices, and they show how systems can be applied to checking the going and coming of any number of employees or piece workers, in any kind of business. One of the articles describes the method of keeping tab on cars in a garage and is entitled "How Garages Check the Chauffeurs." It is full of helpful information for the man who buys labor and is looking for the maximum return.

Pennsylvania Rubber Company, Jeannette, Pa.—"Factory Facts, for Buyers of Automobiles" is the cover title of an attractive little booklet issued by this firm. The "facts" referred to have to do with the manner in which Pennsylvania tires are manufactured and some salient points in the process of making them, as compared with others, are clearly brought out, together with the advantages that accrue from them in increased service and durability. For instance, "Fact One" deals with the vulcanizing of the tires; "Fact Two" shows the special bias woven fabric that is used in the making of Pennsylvania tires and shows its advantages over the usual fabric which has to be cut bias in comparatively short pieces, while "Fact Three" illustrates the special machine used for wrapping as compared with the hand process usually followed.

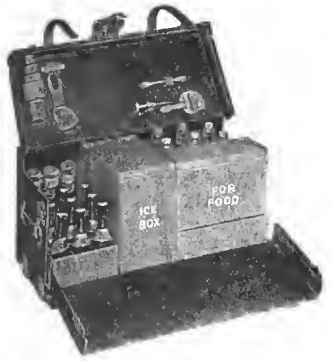
McKeown Brothers, Chicago.—This is a booklet descriptive of the "Lattis Truss," of which this firm are the patentees and builders. It is a form of construction especially adapted to the building of garages, in which it is very undesirable to have the floor encumbered with posts or pillars, particularly as trusses of the "Lattis Truss" pattern can be built up to 100 feet span of sufficient strength for all roof purposes. The booklet describes in detail the method of constructing the trusses, the materials used, and also gives a list of buildings in which this patented form of construction has been employed, and it is a noteworthy fact that quite a few of the prominent garages in Chicago and neighboring territory are found in it. The booklet is profusely illustrated with photographs of the various buildings in which the "Lattis Truss" has been used.

Keystone Lubricating Company, Philadelphia.—Specially prepared for the campaign this firm is now making in the introduction of Keystone grease in the automobile trade are two attractive folders, one entitled the "History of Lubrication," and the other "Heat Has No Effect on Keystone Grease." In the former is described the transition period of lubrication, in which dissatisfied users of oil were led to adopt the first kind of grease offered, and after having experimented with many, found that all had the faults of oil, or were even worse, owing to the fact that they did not combine the proper qualities of a lubricant. What these qualities are and how they are combined in Keystone grease is also related. In the second pamphlet, the importance of using a pure lubricant is dwelt upon, and the danger of employing animal greases on fine bearings, or for that matter, on any bearings, is made apparent. Both are excellent briefs for Keystone grease.

Stevens-Duryea Company, Chicopee Falls, Mass.—"Stevens-Duryea, 1909, Model X," in light green on a buff cover forms the preliminary word of a new booklet from these Massachusetts builders who are sending it out to introduce Model X, a newcomer to the Stevens-Duryea fold. In the actual foreword to the contents of the booklet, the makers point out the fact that in bringing out this new model improvements have taken the form of refinements rather than departures from principles previously followed, and a review of the specifications of the car shows this to be the case throughout. Model X has been brought out to fill the demand for a four-cylinder car having a little more power than the Stevens-Duryea Model R, which has been discontinued. As a matter of fact, Model X is practically an enlargement and refinement of its predecessor, embodying all those features of Stevens-Duryea design and construction that have become familiar. It is attractively described and illustrated.

INFORMATION FOR AUTO USERS

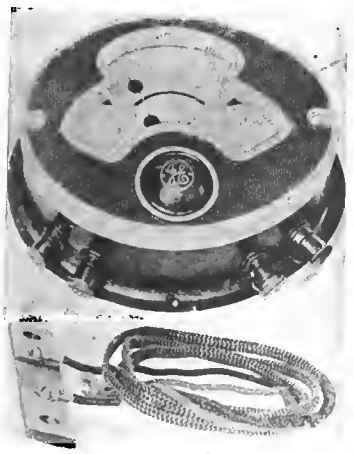
Auto Rear Ice Trunk.—Now that touring into more and more unknown parts of the country is coming into vogue, it is becoming customary to carry a supply of provisions and drinkables along so that entire dependence need not be placed on the casual wayside inn, that is so often lacking when most needed. To meet this demand, W. W. Winship, 71 Summer street, Boston,



WINSHIP TRUNK FOR COOL LUNCHES.

Mass., is placing a wide variety of different kinds of kits for this purpose on the market. One of the handiest is the ice trunk shown by the accompanying illustration. As will be seen, this is arranged with a zinc box for a large piece of ice, and has besides large individual boxes for fruit, meats, sandwiches, glasses. It holds six quart bottles, or nine pint bottles and when necessary, the entire interior fittings can be removed and the trunk used for ordinary purposes.

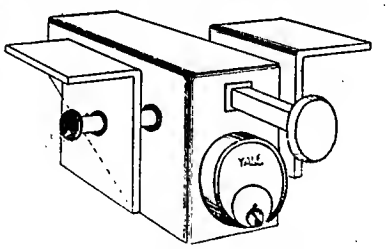
A New Auto Instrument.—The General Electric Company, Schenectady, N. Y., has lately placed on the market a new automobile instrument for use on electric vehicles. This instrument, known as the type DK, consists of a combination ammeter and



NEW G. E. CO. VOLT-AMMETER.

voltmeter enclosed in a dust and moisture proof aluminum case and is especially designed to withstand without injury the constant vibration and exposure incident to this class of service. The magnets used in DK automobile instrument are made from the best quality of magnet steel obtainable, the special processes of aging and hardening further insuring their permanency. Another important advantage is the fact that they are strictly dead-beat. The scale divisions are very uniform and legible. The standard voltmeter scales are 120 and 80 volts. Either of two ammeter scales is standard, viz., 150-0-150 or 70-0-150. It often becomes necessary to measure the voltage across individual cells and for this purpose a second voltmeter scale reading from 0 to 3 volts will be furnished on request. The severe vibrations to which automobile instruments on commercial vehicles are subjected, prevents the indications being read. To overcome these difficulties, the General Electric Company has designed an "Anti-vibration Support" upon which the type DK instrument may be mounted.

"Break-Circuit Auto-Lock."—There is nothing easier to make way with than an unguarded electric, while the possibilities of losing a gasoline car by theft are now very great as well. To prevent such a misfortune as this, the Safety Device Company, 431 East Tenth street, Indianapolis, Ind., are placing on the market what they term their "Break-Circuit Auto-Lock." Its construction is such that it can be readily in-



FITING OF BREAK-CIRCUIT AUTO LOCK.

stalled on any electric, and it is a very simple matter to attach it. In fact, it may be placed in two or three different locations, according to the particular arrangement of the car under consideration, and in any case, it is inconspicuous and not easily tampered with. Its appearance as installed in one of the numerous different ways which the makers suggest in their detailed instructions is shown by the accompanying line sketch.

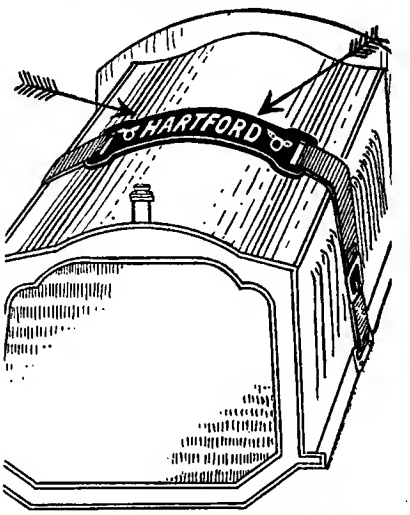
Style "B" Prest-O-Lite Tanks.—For use on small runabouts and roadsters, the Prest-O-Lite Company, Indianapolis, Ind., manufacture what they term the Style "B" tank. The latter has a capacity of 40 cubic feet. Many autoists who have invested in these small tanks find out later that the Style A tank with its capacity of 70 cubic feet would have served their purpose better. To all such, the Prest-O-Lite Company is making a special offer. They will refund the full purchase price, supplying one of the larger tanks for the difference in the list, amounting to $15. Although the Style A tank has almost double the capacity of its small brother, there is only a difference of $1 in the cost of recharging. Any of the numerous Prest-O-Lite branches or agencies will make the exchange.

Quick Detachable Terminal.—An entirely new form of quick detachable terminal for use on primary and secondary circuits has recently been put upon the market by the Conn. Telephone & Electric Company of Meriden, Conn. A great deal of trouble has been caused heretofore by the breaking of connections on timers, etc., and if the Connecticut Quick Detachable Terminal possessed no other advantage than the elimination of such annoyance, it would prove its value many times over. The ball and socket construction allows the connector to swivel or turn in any direction. The Connecticut Terminal is made up in two types suitable for use as a primary or secondary connector. The secondary connector is fitted with a rubber collar or sleeve which covers the end of the wire and makes a very neat finish. It is simply necessary to cut the wire off straight, push on the rubber sleeve, pass the wood screw through the hole in the stud and screw it down tight. The primary terminal is connected by cutting off the wire straight, slipping it into the hole in the stud carrying the spring, then placing the screw in position (as indicated in the illustration), screwing it down tight.

QUICK DETACHABLE TERMINAL.

Both the primary and secondary terminals are furnished with an adapter, as shown, unless otherwise specified. These adapters will fit any plug or terminal (not over 3-16-inch in diameter) by removing thumb nut, slipping on adapter; then place thumb nut back on screw. It is being shown by the National Sales Corporation, 296 Broadway, New York.

Hartford Hood Anti-Rattler.—There is nothing quite so annoying about an otherwise well-kept car as to have a persistent rattle, which means nothing in itself, but which sounds as if it portended something serious to the uninitiated ear. Many an otherwise well-designed hood is frequently guilty of this, and to eliminate the annoyance, the Hartford Rubber Works Com-



HARTFORD ANTI-RATTLER IN PLACE.

pany, Hartford, Conn., has just placed on the market what they term the Hartford "Hood Anti-Rattler." It consists of a strip of flexible rubber about a foot long by two inches wide and 1-4-inch thick. It is slotted at each end and when placed over the center of the hood, the leather straps are drawn through these ends and then buckled down firmly. The rubber takes up the vibration and deadens the noise.

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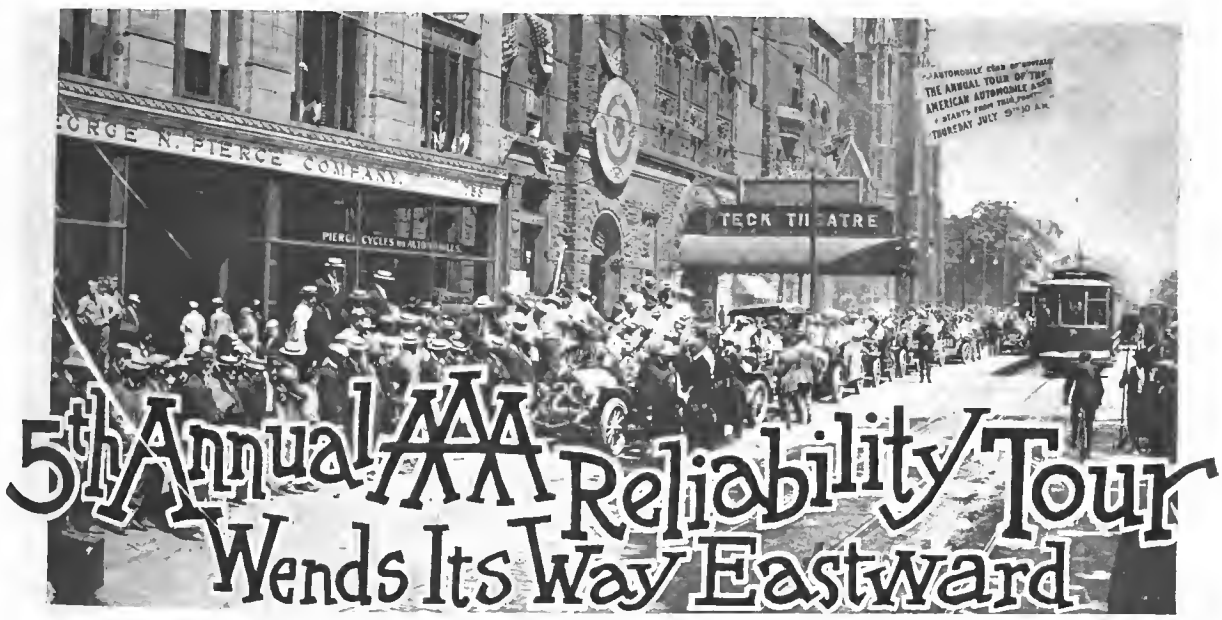
THE AUTOMOBILE



5th Annual AAA Reliability Tour Wends Its Way Eastward

Where the Start Was Made in Front of the Headquarters of the A. A. A. Touring Board, and Automobile Club of Buffalo.

CAMBRIDGE SPRINGS, PA., July 9.—Seated upon the verandas of a commodious and urbán appointed hostelry set upon a hill with a wide prospect of hills and meadows, 300 well contented Gliddenites and Howermen are discussing to-night with satisfaction the outcome of the first day's run of the fifth annual A. A. A. test tour. Forty-six cars contesting for the touring car and runabout trophies and 10 non-competing and official cars had left Buffalo in the morning and had reached Cambridge Springs with the loss of but one of their number—a six-cylinder Gearless runabout, which had collided with a telegraph pole at Westfield, lost all its Hower trophy points, and, in fact, had put itself out of the running for good and all.

All of the other 45 prize contenders had evolved from the day's run without penalization, having made the 117.4 miles run in the 5 hours, 45 minutes schedule time and without any replacement of parts. Had the boss of the run, however, not been a bit lenient, under the rules there would have been several sufferers from too eager promptness or too cautious tardiness in crossing the finish line. The new rules with their allowances for tire repairs and price difference, bothered some a bit, so Chairman Hower cancelled all errors, since the cars were really all on schedule time, but warned all hands that in future ignorance of the law would excuse no one. It took a lot of time and explaining at the daily evening meeting of contestants and observers to get the new rules fixed in all minds. It is to be hoped at least that they are or there will be trouble brewing.

The legal speed limit schedule of 20 miles per hour had been easy to maintain with 56 miles of macadam between Silver Creek and Erie, and the balance of the way at either end of this magnificent stretch over fair country dirt road, is for the most part over fairly level ground.

Buffalo gave the caravan a rousing send-off. For half a mile from the starting point, the street was a continuous grandstand of automobiles on either curb and fully five thousand foot passengers joined in the *bon voyage*. The first car was sent away promptly at 10 o'clock from the Automobile Club of Buffalo, in the Teck Theater building, and the 45 others at one minute intervals thereafter.

By the roadside in South Park, through which the procession passed out of the city, were scores of motor cars parked to bid farewell. In fact, for miles out into the country were automobiles that had been driven out to see the tourists well on their way. The day was sunny, yet cool, and the scenery of appealing gentle beauty, on either side were well kept farms and thousands of acres of vineyards, while in the distance on the right one could see most of the way to Erie, the deep blue expanse of Lake Erie, as beautiful and as impressive as any Atlantic or Pacific.

All along the roads the people had turned out to see the tourists pass. Rosy-cheeked, white-frocked girls waved graceful adieux. Small boys cheered and stormed every car that stopped for cigar bands as souvenirs. At one place a bunch of lassies

Chairman Hower Starting Secretary Lewis in the Pilot Premier Car —Cup Donor Glidden in Front.

held aloft a gigantic canvas sign, "We Hope U WIN," while at Evans Center a hay wagon load of damsels had driven down to see the fun. Tom Fetch made a hasty dismount and gave some photographers a snapshot with Packard's Pride enviably ensconsed in their midst.

In line there were not a few cars that merited and received attention. An Oldsmobile rigged with a Gabriel horn stirred up the countryside by playing popular airs and did not forget, of course, "In My Merry Oldsmobile." The Premier, which is making a century a day for 100 consecutive days, is making its present runs with the tour. "El Toro," the first of the 1909 Packards, which won fame by its Cuban run last winter, was rigged with a close-coupled body and used as a press car with the only Tom Fetch as its pilot and F. C. Riggs in the rôle of Mine Host. It was the niftiest, nattiest outfit in line. The five passengers wore gray caps and dusters to match the gray body and their luggage was packed conveniently out of the way on the rumble platform in gray aluminum boxes.

A Reo carried THE AUTOMOBILE and *Motor Age's* mechanical and photographic staff and had Sales Manager Renshaw for its pilot. It put its passengers on the spot for every emergency and caught the leaders at will when necessity required. A Reo and a Premier served as pilot cars. A Packard with Russell Huff at the wheel bore the Red Cross banner, carried a physician, and transported the starter and checker from start to finish. The two watchmen were borne in a Stevens-Duryea, which started next to Chairman Hower and Charles J. Glidden in a Great Arrow, acting as pacemaker.

There are two women contestants this year. Mrs. Joan Newton Cuneo, of New York, is competing in a Rainier for the Glidden, and Mrs. E. W. Shirley, in an Overland, for the Hower trophy. Mrs. E. S. Berwick is Mrs. Cuneo's guest and Mrs. H. C. Marmon rides beside her husband. By way of illustrating the improveemnf of American cars in a few years it was recalled by old timers that a run of 91 miles from Buffalo to Erie was considered an ample day's journey for the Pittsburgh tour of 1903 and for the St. Louis run of 1904. This year Erie was reached by most of the cars in a round five hours. Turning from Erie inland, the cars had a pretty run over a rolling country to Cambridge Springs, where the many Spring hotels and boarding house guests gave the tourists a warm welcome, as did all the towns en route. At Westfield hundreds of bottles of cool grape juice were put in the cars by the Welch Grape Juice Company.

JOHN C. WETMORE.

As the Cavalcade Passed Through Erie, Pa.

How the First Day Appeared to the Technical Man.

CAMBRIDGE SPRINGS, PA., July 9, 1908.—Of the fifty-eight cars scheduled to leave Buffalo this morning on the fifth annual Glidden tour and the Second tour for the Hower trophy 56 left and 55 reached Cambridge Springs with perfect scores, the one to suffer penalty and drop out being No. 105, the Gearless runabout entered and driven by John Breyfogle of Rochester. This car was eliminated when three miles east of Westfield. The car, traveling at a fast pace, struck a round stone in making a curve which resulted in an unexpected skid that brought the machine radiator end on into a telegraph pole, bending the frame, breaking parts of the steering mechanism and putting it permanently out of the running for the Hower trophy. Fortunately none of the party was injured.

On the Way to Cambridge Springs—Pierce Great Arrow Team.

The schedule for the 117 miles was 5 hours and 45 minutes for the big cars with 10 minutes extra added for the small Hower cars listing at $2,250 to $3,500, $1,500 to $2,250 and under $1,500, respectively; 10, 20 and 30 minutes extra, respectively, for Glidden contestants listing at less than $2,500. The start from the Buffalo Automobile headquarters was purposely delayed until 10 o'clock in order that Starter Ferguson and Chief Observer Stidham would have a good opportunity to drill observers and drivers in what will be the daily routine to be gone through in taking a car out of the night parking space. With police assistance this was well managed and at 15 minutes before ten the cars with drivers and observers in place were lined up along one side of Main street awaiting the start. The start was to be according to receipt of entries, the first received entry going first, being No. 100, the Great Arrow runabout in the Hower contest. Behind it were the three Great Arrow Pierces Nos. 1, 2 and 3 constituting the team in the Glidden contest. Fourth position was occupied by R. M. Owen in his two-cylinder Reo Glidden contestant with four passengers up and ranged behind him were Nos. 5, 6 and 7, the three Peerless Glidden machines forming the team of the Automobile Club of Columbus. It was noticeable how teams clung together, Nos. 29, 30 and 31, the three Garfords, making up the Cleveland team, being together.

The rule permitting the carrying of but four passengers, if desired, in the big Glidden touring cars was very closely ob-

An Official Gasoline and Oil Station on the Road.

The Fisk Rubber Company's Locomobile, Tire Laden.

served, all of the big Pierce, Peerless, Marmon, Franklin, Garford and other machines carrying but this number. There were one or two exceptions: Paul Gaeth in his Gaeth car started out with five, so did No. 11, the Buse six-cylinder Thomas, but all others carried four which was in marked contract to the five and six carried in many of the contesting machines a year ago. Among the Howe trophy candidates, the Franklin, Reo and Blomstrom started out with two, but all others, from the big Pierce down to the three little Overlands, carried the three passengers. On many of the runabouts with the single bucket seat not a moiety of comfort was for the observer who occupied it. In a few cases handles on the backs of the front seats offered good holding space, but in others these were absent, and the bad roads made it a precarious perch.

Standing of the Teams at First Day's End.

At the end of to-day's run all of the ten contesting teams have perfect scores or credit marks of 1000 points. These teams are Buffalo Automobile Club, 2; Rochester Automobile Club, 2; Chicago Motor Club, 2; Syracuse Automobile Club, 1; Cleveland Automobile Club, 1; Columbus Automobile Club, 1; Bay State Automobile Club, 1. DAVID BEEGROFT.

SECOND DAY—CAMBRIDGE TO PITTSBURG.

PITTSBURG, July 10.—To-day's run through the great steel mill towns of Pennsylvania was an ovation that continued during the latter half of the journey and culminated in a great demonstration in the Smoky City. The caravan arrived with its competing members lessened by one more off the perfect score list and another wounded by a repair penalization. In passing through New Castle, where the enthusiastic inhabitants urged the tourists to slow their paces, H. S. Van Tine, driving Garford No. 29, in dodging a man in the road, skidded into the curb and put its rear wheel out of commission. A new wheel was obtained from a car of the same make and fitted. This was a new part not carried and so the car had to be disqualified under the rules. Though it lost two hours in making the repair, it made up all but a half hour. It was hard luck that the Cleveland team shoud lose its perfect score through a mere life-preserving accident. Oakland, No. 28, burned out a connecting rod bearing and had to make a replacement which cost it three points, to which four points had to be added for tardiness. A. L. Kull got in very late with the little $750 Gyroscope and was charged with 296 points. Overheating had been the trouble that was responsible for its long delay.

At Hotel Rider, Cambridge Springs, Pa., Where the First Night Was Spent.

Crossing a Pioneer Bridge in the Pennsylvania Mountains.

The run to-day called for 122 1-2 miles in six and one-half hours, an average of 19 1-2 miles per hour. The original route was so changed that only the 44.6 miles to Mercer remained of the lay-out. New cards were given out from Mercer to Sewickley (103.2 miles) and from this point into Pittsburgh the tourists had only confetti and signs to rely upon. The journey was by no means an easy one. The 63.2 miles' trip to New Castle was up and down short, steep hills all the way. Then came brick pavements through the towns with rough country road between as far as Sewickley, whence there was fine macadam most of the way into town.

The wave of welcoming enthusiasm began to roll at New Wilmington. The town was literally smothered in flags, and every man, woman, boy and girl seemed to have one to wave. At one point a long hedge blossomed with little flags, and at another a building frame fluttered with scores of them. All through this section the course was marked by the white flags of the Automobile Club of Lawrence County. Everywhere the girls had donned their white Sunday-go-to-meeting dresses. The chief enthusiasts, though, were the small boys, who are taking a significant interest in motor cars that will mean much in the future generation for the universality of their use, the building of good roads, and the enactment of reasonable legislation.

It was at New Castle, though, that the enthusiasm of the welcome to the caravan reached its culmination. Sporting blood runs rich and red in New Castle veins. All the intersecting streets were roped off. At every one of the many turns of the route through the town there was a flagman. Every policeman yelled "Go on!" and every man shouted, "Hit her up!" No wonder some of the drivers lost their heads and sped down the narrow lanes of spectators at 40 miles an hour. It was a kind Providence that saved the good New Castle sportsmen from furnishing the dailies with headlines.

At Quaker Valley, Edgewood, and Sewickley the caravan entered Pittsburg's suburban park residential districts. The macadam wound among the palatial country homes of the steel magnates. From this point the tourists were to rely solely on Dai Lewis' confetti trail, but Philip S. Flinn, a former perfect score Glidden ite, and his fellows of the Automobile Club of Pittsburg had put up signboards all the way into town. For this they were thanked by special resolution at to-night's meeting of the contestants at the Schenley.

Great crowds greeted the caravan with effervescent enthusiasm as it entered and passed through the Smoky City. Speed limits were thrown off and the police joined in urging the drivers to "hit it up," just as they had at New Castle. The weary travelers had a luxurious evening's rest at the Schenley. They dined on the veranda or strolled on the lawns while they listened to the classic strains of the famous Pittsburg orchestra. But everyone turned in early in anticipation of the next day's work.

J. C. W.

Penalizations of the Second Day's Run.

PITTSBURG, PA., July 10.—Three Glidden contestants were penalized to-day, but the penalty against one lifted by the committee, leaving the count but two, enough, however, to put two of the ten teams struggling for the Glidden trophy out of the perfect score class, the second Chicago Motor Club and the Cleveland club teams losing. The three losing cars carried Nos. 27, 28 and 29 and were two Oaklands and a Garford. No. 28, J. B. Eccleston's Oakland, was debited two points because a passenger other than the driver and mechanic poured some of the gasoline into the tank at one of the fuel stations. This was allowed to stand, but the committee later decided to remove the penalty and also not to make it penalizable for any of the passengers to put in gasoline or water. This decision, rendered at the night meeting, was received with applause by all of the contestants. No. 28 Oakland, of the Chicago team, burned out the lower bearing of a connecting rod and had to put in a new rod. This work was facilitated due to the peculiar motor construction of the Oakland, which is a two-cylinder vertical power plant with removable cylinder heads. Removing the heads with the access offered by side openings in the crankcase gave suffi-

Hal Sheridan's White Steamer Descending a Rugged Hill Near Cramer, Pa.

cient room to take out the old and fit the new connecting rod without other dismantling of the motor, the driver and mechanic doing the work in a little over one hour. In spite of the delay the car made up all of its time but four minutes. Its total penalty was seven, three for replacement, the connecting rod costing $2.20, and four for time. This gave a penalty of 2.3 against the team composed of the two Oaklands and Mrs. Cuneo's Rainier.

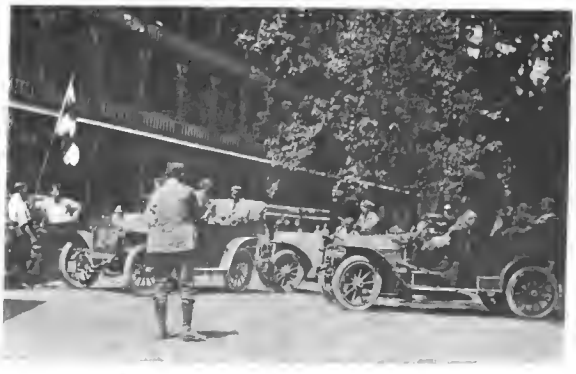
The Cleveland Automobile Club suffered more severely, in that No. 29, Garford, was given the whole debit of 1,000 points because of the breaking of a wheel and replacing it with one not inventoried at the start of the tour. The accident occurred in the outskirts of New Castle, Pa., through which town fast speed was made by many of the cars because of the encouragement given them by the police and the demands made for speed by the thousands of citizens who thronged the streets. Leaving the city many right-angled turns had to be made and after taking one of these the car quickly swerved, causing a bad skid, thus throwing the wheel against the curb and wrecking it. A new wheel was taken off a car in New Castle and the car completed the day's run and will continue to the end of the trip. The entrant made certain protests to the committee against the disqualification on the ground that the accident was the result of a measure to conserve life. After a hearing the disqualification was allowed to stand. The remaining 28 cars fighting for the Glidden trophy finished with clean scores, as did the two Stevens-Duryeas in the contest for Glidden certificates. And of the 13 Hower trophy cars one, No. 113, the Blomstrom gyroscope, was given 296 points on time, it not reaching the checking station at Hotel Schenley, Pittsburg, until ten minutes to ten. The driver, A. L. Kull, reports the lost time due to five changes of tires that had to be made.

An important feature of to-day's run which THE AUTOMOBILE correspondent had an excellent opportunity of observing was how the cars performed on Kennedy's hill a couple of miles out of Meadville. This hill is a winding ascent of over a mile with water gutters across the road, plenty of sudden 15-per cent. grades followed by smaller grades and good turns. Garden's Great Arrow was first to take it; he made half the ascent before dropping from direct. Arthur Kumpf, who followed him a few rods, took the hill the same way and a little later J. W. McGuire in the third Pierce, went entirely up on the high. Burman in his Peerless made a nice high gear run of it and so did one of the Stevens-Duryeas. The air-cooled Franklins performed particularly well and passed other cars with facility on the hill. One of them took a Studebaker in tow when half up the hill and on the steepest part of it, and another did the same trick with Frank Nutt in his Haynes. The sport on the hill was watched by scores of motorists who had come from surrounding towns eager to see what the tourists would do on a hill that gives the local motorists plenty of trouble. Mrs. Cuneo was loudly cheered as she made the ascent well up on the high and only changed when near the top. Mrs. Shirley was also well received in her little overland. R. M. Owen in his Reo changed from direct when crossing a sidewalk across the road in the center of the hill and immediately went into direct again and made the remainder of it on direct. The hill is very deceiving from the foot, which was largely responsible for the poor performances not a few of the cars made. At times the machines were coming up in twos and threes and this sight coupled with that of watching them approach the hill over a mile of fine macadam in the valley made one of the most interesting points of this year's Glidden. Tire troubles occurred everywhere, the loose stones working particular havoc all along. When but a short distance out of Pittsburg, Foster's Gabriel Horn car had to change a left front casing. No. 9, H. O. Smith's Premier, had tire difficulties just before starting the mountain climb. No. 5, the *Motor Age* Reo, changed a right rear casing in the mountains, and No. 38, Fiske tire car, reported changes of tires being made at many points along the course, the pneumatics causing frequent delays throughout the day's run. D. B.

Waiting to Check In at the Pittsburg Control.

The Haynes and the Horse Take a Drink Together.

E. H. Parkhurst's Peerless Arrives at Johnstown Control.



Arrival of the Tourists at Bedford Springs Hotel.

Between McConnellsburg and Fort Loudon, Pa.— J. N. Willys' Overland (Hower Trophy Contestant) in the Foreground.

THIRD DAY—PITTSBURG TO BEDFORD SPRINGS.

BEDFORD SPRINGS, July 11.—The run to-day carried the caravan across three mountain ranges of the Alleghenies with magnificent scenic surroundings, but—Oh! such roads! A new and tougher path by far than that of last year was laid out, yet hard-hearted Hower cut the running time from 9 to 7 hours, an average of 17 miles an hour for the run of 106.4 miles.

There was only one knocked out for all that, the No. 111 Overland runabout, driven by C. R. Forth, which hit a rut just out of Pittsburgh and went down and out with a broken axle. A leaky carbureter exuding gasoline in the neighborhood of the magneto caused a bad fire on Stoddard-Dayton runabout No. 109, which cost it 168 points. Overland runabout No. 108 failed to make the schedule by 9 minutes, and A. L. Kull's little $750 Gyroscope did not get into camp until one o'clock.

This was not the total of casualties and penalizations to be reasonably expected from such a day's pushing up mountains, pounding over rocks and hammering bumps by 803—some one claims to have counted them—thank-ye-marms. There were some noteworthy fast runs made. Billy Hurlburt was delayed an hour and three-quarters and was forced to cover the course in 5 hours 7 minutes to escape time penalization, and the other Garford, which is now running as a non-contestant, was driven by Van Tine over the last 26 miles in 59 minutes.

The environing scenery was varied and roughly picturesque most of the way. One beautiful stretch of macadam which ran through the Connemaugh Valley into Johnstown gave a view of a dark green stream below shut up by high, steep mountainsides. We of the "El Toro" outfit lay over in Johnstown for dinner and were shown the water mark on the Capital Hotel and told by Mine Host the thrilling story of the great flood which cost no less than 3,000 lives so many years ago.

Picturesque Road That Led from Mt. Dallas.

Out of Johnstown a four-mile climb gave a taste of what was ahead before the two intervening mountain ranges could be surmounted. Then followed the long pull over the Allegbenies. Seventy miles' running through a narrow valley hemmed in by steep wooded hills brought the caravan to the Bedford Springs Hotel. There was such a good attendance of regular patrons and non-motoring guests that many of the Gliddenites were forced to seek accommodations at another nearby hotel or at the village inns. There was a rush for the swimming pool. In the evening there was a peaceful loaf on the verandas and lawns, though a few indomitable terpsichoreans like Spooner and Lazarnick actually had enough in them for a dance.

Sunday Was Spent at Bedford Springs.

BEDFORD SPRINGS, PA., July 12.—This old-fashioned resort hostelry nestled in an umbrageous little valley with green tree-shaded lawns formed an ideal spot for a rest from the three days of road battling that have passed and for the week of highway campaigning that is ahead before Boston's haven of two days of rest is reached next Friday night. There was to-day the luxury of a late breakfast. Then came a two hours' frolic in the swimming pool. A few, very few, took rides in their cars. The one strenuous machine was the Premier press car, which H. O. Smith and *Fate* have condemned to a 10-000-mile treadmill, made up of a hundred consecutive centuries. It made a semi-century morning and afternoon and reached, if the writer's tired memory serves him right, its 49th hundred-mile run to-day, so that its task is about half done.

The newspaper men alone were forbidden to join the loiterers. They had lost time to make up and thoughts to put to print, the inspiration of which had hitherto been robbed by long days of hard riding. So far there has been harmony. Penalizations have been accepted without strident protests. Of course, there have been kicks over the room allotments. There always will be.

J. C. W.

Troubles of the Third Day Technically Told.

BEDFORD SPRINGS, PA., July 11.—To-day's run of 106 miles over the mountains from Pittsburgh to Bedford Springs did not prove the undoing of so many perfect scores as speculation had prophesied, the reason for this being the seven-hour schedule set for the big cars, with the usual extra allowance of 10 minutes for the small Hower cars and 10, 20 and 30 minutes for the smaller Glidden contestants. Only two of the Glidden Cup rivals had trouble: 19, Frank Nutt's Haynes losing the center bolt out of one of its springs. As yet it is not known whether Nutt will receive a penalty or not, owing to the fact that he took the spare bolt used out of the sealed bag containing extra spare parts, which would entail a penalization of one point. After his arrival here, Nutt declared that he has one of these bolts in his regular parts bag and if so he will be allowed to use it

and will not be penalized, as the use of regular spare parts does not entail any debit marks against a Glidden contestant.

Not so fortunate, however, was William Hurlburt, driving No. 31 Gsrford, which hroke one of the drive shafts in the floating rear axle. In all, one hour and fifteen minutes were needed in removing the old shaft and replacing the new one. After this was done, Hurlhurt gave an excellent demonstration of road driving, succeeding in heating the seven-hour schedule by eight minutes, showing that he had negotiated the 106 miles of mountain travelling in 5 hours and 7 minutes, or at over 20 miles per hour, a wonderful performance considering the long mountain climhs, the tortuous mountain descents, the scores of water breaks and the frequent stretches of road on which loose stone and dirt were piled. Hurlbut's total penalty has not yet been placed. This Garford trouble, taken in connection with that experienced hy Garford No. 29 on Friday, when a wheel was hroken, puts the Cleveland clubs in had shape. These two troubles do the cars an injustice hecause all three were brand new from the factory and had not been run or limbered previous to the start from Buffalo on Thursday morning.

What Happened to the Hower Trophy Contestants.

In the Hower ranks five cars came to grief, four of which received penalties. No. 108, Mrs. Shirley's Overland, was penalized 9 points for time; No. 109, Stoddard-Dayton, entered by H. C. Tillotson of Chicago, was debited 168 points on time, the trouble arising from the gasoline around the carbureter igniting from a short circuit on the magneto. In this car the carbureter, magneto and timer are grouped on the left side and the vapor formed from a leak in the carbureter quickly ignited when a short circuit took place. The mechanician's hands were severely hurned in extinguishing the hlaze, which was confined to the motor. Dr. Hoag in the Red Cross Packard fortunately was near at hand and dressed the wounds. The car continued its trip. This car also suffered a fracture of the two hrackets to which the forward end of the radius rods attach. These brackets are bolted to the side members of the frame and new ones which were carried in the spare equipment were used.

No. 111, Overland, hroke a rear axle a short distance out of Pittsburg, and took the full count of 1,000, the car discontinuing the tour. The accident happened when on a fairly good road, the rear wheel spreading and the differential case settling to the ground. A. L. Kull's Blomstrom Gyroscope, No. 113, checked out of Pittsburg hut did not reach here until midnight.

Monday's Was a Very Hard Day's Run.

To-day's run was one of the hardest of the contest so far and it is gossip here to-night that none of the succeeding days of the tour will approach it. There are longer days' runs scheduled, some reaching thc 194-mile mark, hut these will he

The Garford Passes a Ruined Farmhouse.

over good road surfaces on which cars can make fast time. In to-day's climb over the Alleghenies, the road for miles was hut a sandy trail with stone hottom winding between acres of burned woods at one place and dense forests whose hranches formed a continuous arch across the roadway and hrushed the heads of the drivers and passengers at other places. The roads twisted and contorted every fifty or two hundred feet and were crossed hy improvised hridges whose planks got out of place after the first car or so had crossed. On these roads the water hreaks were not so omnipresent as on the course followed a year ago, hut what was gained by their ahsence was more than compensated for hy the masses of hugh hroken boulders over which the cars had to travel with the danger of one or two punctures while going over them. D. B.

FOURTH DAY—BEDFORD TO HARRISBURG.

Harrisburg, Pa., July 13.—The 107.3 mile run from Bedford Springs was almost a repetition of Saturday's journey from Pittsburg. Though two-thirds of the journey's end into Harrisburg was over a fairly good macadam, and, in fact, stone roads ran most of the halance of the way, there was a far more constant pounding over water hreaks at an average of 200 feet intervals and the long climhs up Mount Dallas and Mount Cove were through long stretches of heavy sand. The six-hour schedule calling for an average of 18 miles an hour played the mischief with fast running the first third of the journey and gave the cars a merciless hammering that promised to tell heavily on the scores at the end of the day.

In the face of such a journey no little havoc was wrought on the perfect score slate. Two teams, in fact, dropped hack into the ruck of the also-rans. The Syracuse and Rochester trios evolved with a car apiece penalized. Franklin No. 12,

Where the Cars Were Parked at Harrisburg at the End of the Fourth Day's Journey.

One of the Good Luck Signs That Greeted Them.

driven by C. H. Talbot, which had broken and mended a spring the first day, stopped at Harrisonville to weld a new spring leaf under the amended rules permitting new parts to be made out of raw material and arrived so late that it lost 61 points. The Selden, which also had had trouble with its springs, was very late. Its exact penalization had not, however, been announced at the writing of this letter late in the afternoon.

The Hower runabout perfect score division was still further decimated. Franklin No. 106, piloted by J. H. Daly, broke several front spring leaves and suffered a penalty of 181 points. Moline No. 102, driven by W. H. Vandervoort, sprung a leak in its cylinders three miles outside of Harrisburg and was penalized 51 points. It is hoped, however, that the leak can be plugged so that the car can continue.

To-day's journey was another day's run through magnificent mountain country. The long hard pulls of three or four miles up the sides of the Blue Ridge range had their compensation during the winding descents of glorious panoramas of broad farm checkered plains or picturesque valleys with green wooded hills some times in the foreground and at others blue mountains in the distance adding to the charm of the scene.

Old Chambersburg reached and historic rebellion days' ground was traversed. Before and after the Battle of Gettysburg the Yanks and Johnny Rebs fought through the streets of the old town, part of which the confederates burned in their retreat.

The caravan passed also close to the buildings of the Indian School and also of Dickinson College at Carlisle. All this was very interesting, but all the tourists asked why in the mischief Frank Hower had taken it into his stubborn head to cut them off from a view of the famous Gettysburg battlefield, which was only 25 miles away and could easily have been reached, while it also afforded a run over some of the finest stone roads in Pennsylvania. He played the caravan the same mean trick on the tour last year and there was much uncomplimentary comment.

The Rapid Car That Carries the Goodyear Tires.

There was the same enthusiastic reception that marked the first three days of the journey. The Chambersburg Motor Club not only stretched a banner, "A. A. A., We Hope U All Will Win" across the road, but built a triumphal arch inscribed "Welcome" on the main street of the little town.

It was a refreshing sight that made one realize that he was out in the real country to see the calico sunbonnets of the women and the blue jeans of the men so universally prevalent inside the towns. All along the entire route one ran across Cadillacs, Fords, Ramblers, and even more pretentious cars of the Franklin type owned by the farmers. There were also not a few higher priced cars by the roadside filled with fashionably gowned passengers from the towns.

The "Gabriel Horn" car, piloted by C. H. Foster himself, is adding much life to the tour and stirring up the countryside in great fashion. All through the towns the pianoist hits up lively airs and gives the people a listening knowledge of "The Gang's All Here" and the latest Broadway musical comedy songs which as yet have not reached this far.

That live wire bunch, the Motor Club of Harrisburg, is giving the tourists a smoker to-night. The caravan is split between two hotels, the Lochiel and the Metropolitan. The former is official. The latter, though, has a bath to each room and the press boys for once seem to have the better of the deal.

Motor Club of Harrisburg Gives a Smoker.

At the Motor Club of Harrisburg's smoker speeches were made by Hon. Edward S. Stewart, Governor of Pennsylvania; Hon. E. S. Meals, Mayor of Harrisburg, who, as vice-president of the club, spoke in the absence of Vance McCormack, the president, at Denver. Incidentally R. H. Johnston, referee, and D. A. Beecroft, chairman of the A. A. A. Technical Board, presented the medals won in the club's recent endurance run.

Tentatively Chairman Hower has asked not a few of the makers on the run what they think of running next year's tour to Denver—it being an open secret that the Colorado metropolis is in his mind as the 1908 destination—being run circus fashion with a camp pitched each night by professional tent men. The novel idea is making a hit. J. C. W.

How the Fourth Day's Run Told on the Score.

HARRISBURG, PA., July 13, 1908.—To-day was calamity day in the Glidden and Hower ranks, two of the perfect score teams falling from grace and three of the perfect score Hower runabouts being eliminated. The Syracuse Automobile Club has 20 demerit marks chalked up against it due to No. 12 Franklin touring car being 60 miutes late, for which it received 60 points. The cause of the trouble was due to the breaking of the rear spring that broke on the first day's run near Fredonia and which was so quickly welded. To-day it broke in the same place, and the repairing cost 60 points, which counts 20 against the club, making its mark 940. Although the spring has been rewelded the driver is doubtful as to whether it will endure much longer. Much talk has been occasioned because of the Franklin spring trouble and not a few of the tourists ascribe the trouble to not equipping the machines with shock absorbers. The other club to suffer was the Rochester one, composed of the Gaeth, Thomas and Selden, the Selden being the offending member of the team, its troubles resulting from the breaking of all of the leaves of a spring on Saturday's run to Bedford Springs. This leaves but seven perfect score teams in the Glidden cup struggle, namely, two Buffalo teams, first team in Chicago Motor Club, the Studebaker-Rochester team, the Marmon team under the colors of the Bay State Automobile Club and the Columbus club composed of the Peerless cars.

The three to fall in the Hower ranks are No. 102, the Moline runabout that was held up within three miles of Harrisburg due to motor troubles and was penalized 51 points on time, the motor trouble not calling for any replacements of parts. No. 106, the Franklin runabout, had trouble because of breaking one

(*Continued on page* 105.)

GERMANY'S VICTORY IN GRAND PRIX OF FRANCE

Mercedes Redivivus, then Benz and Benz Again, with Clement Fourth Followed by More Germans—Italy Fails to Figure Dangerously

By A. G. BATCHELDER

DIEPPE, July 7.—France to-night isn't exactly sure that automobile racing pays. "Made in Germany" it a label that does not find extraordinary favor in the land of the fleur de lis. To have had one Lautenschlager the winner of the Grand Prix were sorrowful enough, but to have had his Mercedes chased by two Benz racers and the nearest French contender a fourth, added to gloom still further intensified by the subsequent arrival of three more Germans. Think of it! Six cars out of the first ten bearing the hated label and that tenth one from Belgium! No wonder that the departures from the grandstand began before the elated Lautenschlager had completed his tenth round. Yes, he received some cheers—there were a goodly number of Germans present—but the enthusiasm of the multitude evoked that same quality of joy which may be expected when the home team loses out in the ninth inning and there is no consolation.

Mercedes presumably had been placed on the shelf by the French makers, and as for Benz, that car had been heard of in the early days of automobiling. Opel was a name unknown. And to have these intruders survive the ordeal in superb manner, and only a single French car intermingle with them, was cause for lamentations prolonged and undisguised. Last year it wasn't quite so bad to have Nazzaro of Italy win with French runners close up, though that blow gave the racing advocates a jolt that benumbed them for the whole year intervening.

The Gordon Bennett, with all countries participating having five cars each, didn't give France as much chance for victory as she thought her automobile importance entitled her to, and so that event had to give way to the Grand Prix, wherein every maker can have three cars each. For like reason the Vanderbilt, being similar to the Bennett, received the kibosh from the French club and its European satellites.

But this Grand Prix is not working out as satisfactorily as anticipated—France with a preponderance of the entry list has met defeat twice in three years, and the one to-day is a crusher. Automobile sport is most uncertain—and, alas! it is grounded in commercialism. No longer do the multi-millionaires pay the bills and drive the cars. Now 'tis the maker who pays the freight—with rare exceptions—and the expenses are heavy when three entries become advisable, once the plunge is made. France is the only European country which now conducts a real big race, and to hold it with the inevitable risk of losing prestige is chilling the ardor even of those who think racing a good advertisement for the industry.

But there is also sorrow of a different sort to-night, and the startling death of Cissac and his mechanician has called attention to the great risks now associated with high speed contests. Tires can only stand so much, and the Dieppe circuit has been unusually severe this time on the wind-shod shoes of the hard-driven autos. Stretches of road there were which hacked tires as though the rubber was pulp, and it became the usual thing to have car after car limp to the replenishment depots in front of the grandstands and take on fresh supplies of pneumatics.

Lautenschlager, the Mercedes Winner.

As was demonstrated in the practice work, the limiting of the piston area so that a four-cylinder had 155 mm. and a six-cylinder 127 mm. per cylinder did not prevent an increase in the speed. Last year fuel consumption—30 liters for 100 kilometers—was the basis of limitation. Nazzaro then accomplished an average of 70.61 miles per hour for the entire run.

For a single round to-day Salzer on a Mercedes averaged 78.5 miles, and if tire troubles had not multiplied, the winner's average of 69.5 for the entire distance would have been miles ahead of a year ago. Another factor which interfered with the speed was the inadequate tarring of the first day did not improve places reeked with dust that penetrated the goggles of the drivers and made them suffer intensely and use no small amount of caution. The voiturettes race of the first day did not improve the course, which, however, did not impress me any too favorably during a Sunday journey over it. Excellent stretches there were, but one also encountered rough spots and more dust than I have ever seen on any Vanderbilt course. It is only fair to say that thousands of autos visited the triangle on the days preceding the races and unquestionably were greatly responsible for its disappointing condition.

But there is a widespread feeling to-night evident that high speed racing has reached its climax. France can hardly quit now with two successive defeats chalked up against her, and this means that there must be a 1909 race at least. After that—well, one can't state positively. Charles Jarrott even ventures to say that it is now ended, but the English have not been keen on the road racing proposition since the Gordon Bennett in Ireland. Marquis De Dion asks: "What's the use of it? It does not prove anything except that it is easy to endanger life." The Marquis, however, has been opposed to racing for some time, though it is to be noted that he no longer stands practically alone in his attitude among the French builders of prominence.

There were 48 starters, 23 of them being French, and 25 supplied by other nations. There were 23 finishers, only 10 of which were furnished by the home country. Germany put in 9 cars

and finished with 7. Italy had 6 starters and 2 finishers; Belgium had 3 starters, 2 finishers; England had 6 starters, 2 finishers.

America sought experience and did not hope a single instant for victory. The Thomas entry was known to be nothing more or less than a partially remodeled stock car, of less power than any other racer engaged, and participating for the purpose of gaining experience for future use and incidentally to demonstrate reliability. Harry Houpt had a hard task cut out for him from the moment he landed in Dieppe and took charge of the Thomas interests. He labored indefatigably to overcome hurried preparation and the usual handicaps following in the train of doing things in a country where the American way is at times impossible and impracticable. And the Thomas started in its turn, persistently pursued its progress for four rounds, after suffering from tire difficulties in profusion. Then a leaky gasoline tank on the fifth round brought Strang's ride to its conclusion. Many others had fallen by the wayside in the meantime—some of them possessing international reputations.

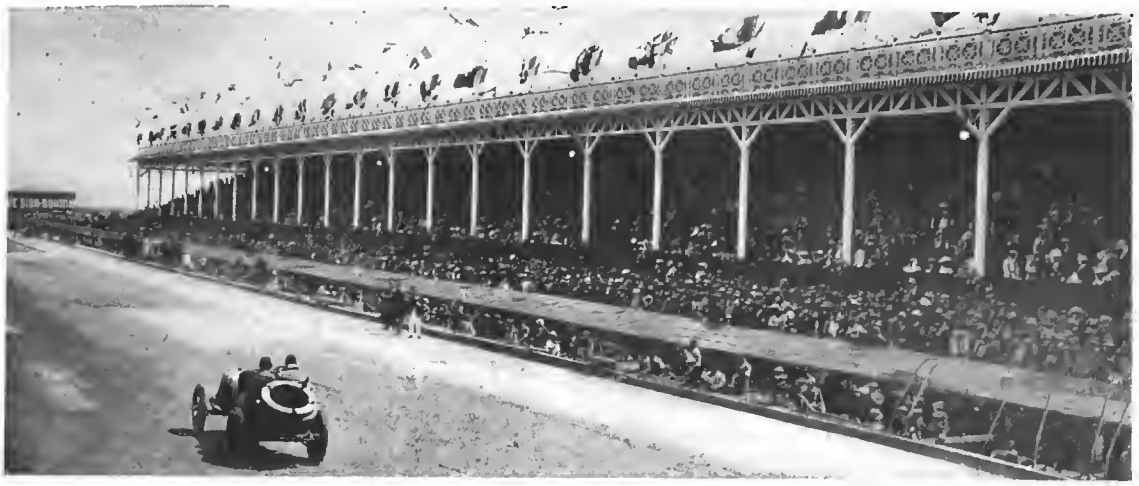
One cannot resist asking, however, as to whether it is worth while for the American maker to seek international racing glory in Europe. There will be no market of much account for American cars in Europe for years to come—if ever—and unless an American can "cash in" a European victory, what is the good of seeking a useless asset. Furthermore, the work of preparation must be thorough and planned not less than a year in advance.

And it might be said right here that several European makers who have been much in evidence heretofore in American racing are doing some careful calculation as to whether it is worth while. Since they race their cars for advertising purposes, they are inclined to compete in the most important event, which, of course, means the Vanderbilt cup. If through some hocus-pocus or other, this is impossible, they are not charmed with the idea of going any distance from New York City, even to accommodate a club which has been over friendly to foreign makers generally and only as recently as last winter had the French ambassador as the guest of honor at its annual dinner. But the present administration of the Automobile Club of America prizes highly its "foreign relations," to "protect" which Dave Hennen Morris, formerly president—and a good one, too—came over for the Grand Prix and a session of the "Recognized Clubs," in the running of which figures dictatorially Rene de Knyff, managing director of a French automobile company and chairman of the racing board of the French club. Of course, the "Clubs" will stick by the A. C. A. through thick and thin, and thereby hangs a tale which will be set forth in these columns in due course of time. Self-preservation is said to be the first law of Nature—and also of "national" automobile clubs. But 'tis good guessing that until America has a real voice and vote in the international proposition, there will be no acceptance by American makers of international racing conditions. If the foreign makers do not fancy our rules, then they can stay away—or compete in a special event arranged for them by their particular friend, the automobile club of "foreign relations" fame. But, alas! Now they are not sure at all that it is remunerative to race cars in America, for the American market is not what it once was for foreign cars.

W. K. Vanderbilt, Jr., was among those who saw the race, and incidentally he made clear to those who cared to know that it is the A. A. A. and not the A. C. A. which promotes the Vanderbilt Cup race and controls racing in America. Robert Graves, who has a Mercedes entry in the Vanderbilt and may have an American candidate also, was another in evidence who made known the American situation, which only now is being understood for the first time. John S. Worden, who drove in the 1905 Vanderbilt, was to be seen. He now lives at Nice. James Butler, owner of the Empire City track, enjoyed the sport immensely, and regretted that the "stars and stripes" didn't have more speed. Cortlandt Field Bishop, president of the Aero Club of America; J. C. McCoy, also of aeronautical fame; J. Harvey Lanning, of the Wilkes-Barre Automobile Club; Hart O. Berg, now foreign manager of the Wright brothers; and A. E. Lumsden, London manager of the B. F. Goodrich Company, were among the American contingent in Dieppe which witnessed the race.

A COMPLETE TABLE SHOWING THE TIMES MADE BY EACH CAR THROUGHOUT THE CONTEST.

No.	Car	Driver	1st Round	2nd Round	3rd Round	4th Round	5th Round	6th Round	7th Round	8th Round	9th Round	10th Round
1	AUSTIN	Brabazon	44:48	1:31:00	2:17:00	3:04:08	3:55:32	5:00:54	5:53:47	6:54:05	7:48:27	8:46:50
2	MERCEDES	Pæge	38:25	1:28:38	2:11:47	2:56:50	3:47:20	4:30:56	5:13:59	5:59:24	6:45:49	7:25:52
3	MOTOBLOC	Courtade	43:19	1:31:26	2:13:52	Abandoned.						
4	RENAULT	Seiss	37:06	1:22:05	Damaged rim.							
5	LORRAINE-DIETRICH	Duray	58:58	1:08:00	Clutch seized.							
6	BENZ	Hemery	57:55	1:19:02	1:58:22	2:39:58	5:24:49	4:10:42	4:50:26	5:34:42	6:19:58	7:04:24
7	F. I. A. T	Lancia	58:58	Broke water-pump shaft.								
8	BRASIER	Thery	57:06	1:17:17	2:04:21	2:47:46	3:33:55	4:15:15	4:59:19	5:44:58	6:40:46	Abandoned.
9	PORTHOS	Stricker	46:15	1:31:02	2:17:12	3:18:27	4:13:13	5:16:45	6:04:07	7:00:47	8:05:52	Abandoned.
10	OPEL	Fritz Opel	44:59	1:28:40	2:17:03	3:16:41	4:09:50	5:00:12	6:39:00	7:06:01	8:11:05	9:08:22
11	BAYARD-CLEMENT	Rigal	43:46	1:33:05	2:18:15	3:10:22	3:46:05	4:50:17	5:20:03	5:57:51	6:44:40	7:50:36
12	ITALA	Cagno	39:26	2:00:48	2:46:05	3:31:00	4:18:37	5:52:07	5:49:52	6:57:29	7:18:26	8:07:56
13	WEIGEL	Laxen	48:36	1:44:05	2:23:54	3:19:04	4:04:40	Overturned.				
14	MORS	Jenatzy	41:31	1:27:05	2:20:31	3:08:21	4:02:22	4:53:25	5:50:55	6:47:10	7:36:50	8:24:44
15	THOMAS	Roberts	55:44	1:57:30	2:54:17	3:52:18	Punctured gasoline tank.					
16	PANHARD	Heath	41:37	1:21:50	2:05:18	2:45:12	5:36:22	4:28:26	5:13:22	5:56:12	7:03:43	7:53:36
17	GERMAIN	Degrais	53:39	1:44:55	2:58:05	3:39:52	4:20:56	5:23:12	6:22:40	7:25:40	8:24:42	9:23:34
18	AUSTIN	Wright	47:54	1:37:45	2:27:22	3:11:55	4:06:10	5:00:19	6:07:15	6:58:46	7:45:40	8:42:50
19	MERCEDES	Salzer	36:31	1:36:05	Abandoned.							
20	MOTOBLOC	Pierron	41:28	1:26:18	2:12:27	3:00:05	3:59:55	4:55:26	5:41:02	6:23:14	7:09:49	8:19:56
21	RENAULT	Caillois	39:20	1:27:19	2:10:44	2:59:58	3:47:25	5:15:48	5:59:04	6:49:04	7:52:40	8:19:56
22	LORRAINE-DIETRICH	Rougier	39:37	Magneto trouble.								
23	BENZ	Hanriot	38:43	1:18:56	2:05:51	2:44:54	3:26:43	4:11:15	4:53:40	5:58:16	6:20:50	7:05:13
24	F. I. A. T	Nazzaro	57:48	1:15:55	1:59:15	Broke crankshaft.						
25	BRASIER	Baras	37:44	1:24:06	4:00:51	Cams worked loose on shaft.						
26	PORTHOS	Gaubert	Did not complete first round. Smashed wheel on turn.									
27	OPEL	Jorns	41:14	1:24:11	2:09:28	2:52:47	5:35:25	4:23:42	5:05:51	6:00:44	6:46:41	7:39:10
28	BAYARD-CLEMENT	Gabriel	38:48	1:50:35	2:48:32	3:29:10	4:20:36	5:02:59	5:55:18	6:37:10	7:27:25	8:11:44
29	ITALA	Fournier	38:55	1:22:32	2:44:17	3:54:31	4:38:25	5:25:50	6:09:00	7:11:25	7:58:20	8:47:20
30	WEIGEL	Harrisson	53:03	1:50:24	2:38:53	Overturned.						
31	MORS	Robin	40:13	1:30:57	2:28:01	3:18:34	4:13:30	5:04:00	6:10:12	6:55:42	7:51:55	8:39:20
32	PANHARD	Farman	46:10	1:30:52	2:19:28	3:15:15	5:59:22	4:45:33	5:35:22	6:42:44	7:53:15	9:24:40
33	GERMAIN	Roch-Brault	44:50	1:29:30	2:22:00	3:07:23	Abandoned.					
34	AUSTIN	Moore-Brabazon	43:35	1:27:47	2:14:47	3:00:38	Engine seized.					
35	MERCEDES	Lautenschlæger	38:29	1:16:55	3:21:56	2:41:36	3:21:56	4:06:34	4:49:35	5:30:53	6:09:35	6:55:43
36	MOTOBLOC	Garcet	42:30	1:29:42	2:12:22	3:13:08	3:54:49	4:41:20	5:31:31	6:26:13	7:24:31	8:12:45
37	RENAULT	Dimitri	44:31	1:27:00	2:33:03	3:15:38	3:57:39	4:50:22	5:33:10	6:17:27	7:05:42	7:54:12
38	LORRAINE-DIETRICH	Minoia	39:59	1:18:48	4:11:42	Abandoned.						
39	BENZ	Erle	45:35	1:27:59	2:10:10	2:59:05	3:45:51	4:32:01	5:19:17	6:10:09	6:55:48	7:43:21
40	F. I. A. T	Wagner	37:13	1:17:38	1:56:25	Abandoned.						
41	BRASIER	Bablot	36:40	1:21:29	2:07:35	2:49:48	3:59:48	4:54:18	5:38:24	6:24:26	7:11:17	Abandoned.
42	PORTHOS	J. Simon	43:31	1:33:43	Overturned.							
43	OPEL	Michel	46:51	1:33:43	2:22:45	3:07:17	4:00:48	4:56:57	4:45:00	6:52:04	8:29:18	Abandoned.
44	BAYARD-CLEMENT	Hantvast	40:09	1:29:03	2:09:42	2:51:33	4:48:51	Abandoned.				
45	ITALA	Piacenza	1:51:23	Abandoned.								
46	WEIGEL	Shannon	49:55	Broke a wheel.								
47	PANHARD	Classe	39:37	1:22:51	2:09:46	2:50:34	3:59:11	4:22:37	5:07:18	5:57:07	Abandoned.	
48	GERMAIN	Perpère	46:44	1:33:39	2:21:02	3:07:26	3:58:36	4:49:05	5:36:25	6:25:06	7:15:55	7:59:07
49												



General View of the Long Grand Stand, Showing the Replenishing Boxes Alongside the Road and the Asphalt Strip.

HOW THE GRAND PRIX WAS RUN AND WON BY THE GERMANS

By W. F. BRADLEY.

DIEPPE, July 7.—At 6 o'clock promptly, the boom of a cannon announced the approaching start of the race. One minute later and Darius Resta, England's race track champion, had shot over the line on the long, green Austin, the leader in what everybody was convinced would be the most keenly disputed automobile race Europe had ever seen. One minute later, Poegge and his Mercedes had evoked the cheers of the strong German element and was racing down the road after the Britisher. Pierron and the Motobloc passed almost unnoticed. Then five of the best drivers Europe can boast stood in line in this order: Szisz, Duray, Hemery, Lancia, and Thery. Szisz and his low built, elegant-looking Renault commanded a hearty cheer; Duray was not lacking in favoritism, but Hemery was treated to cold silence; Lancia, the unlucky, still showed that he was popular with race crowds, but it remained to Thery, returned to the racing game and the Brasier team after an absence of two years, to receive the most prolonged and hearty roar accorded any of the well-known racing favorites.

Stricker, the Yankee driver of a six-cylinder Porthos, was followed by Opel, the German, on his own machine. Behind was little Rigal on the big, blue Bayard-Clement, one of the fastest cars in the race according to preliminary tests. Next followed Cagno, Itala; Harrison, Weigel; and Jenatzy, Mors.

Then came the turn of No. 15 Thomas, with Strang at the wheel. Though the first and second gears had locked on the shaft while driving up to the starting line, Strang went away in excellent style, and was certainly a long way from being the slowest starter among a group of very fast cars.

Thirty-three other cars followed, every start being made with a dash and vim that revealed a determination to conquer in a hard, long struggle. Instead of the 49 cars originally entered, the actual starters were one less, the third Mors, originally intended for Charles Jarrott, but later turned over to a factory mechanic, being absent on account of a break-up while on a previous practice spin. The three English Weigels, too, had at one time been doubtful starters, an accident two days before which cost the life of one of their friends, an amateur driving the 1907 Renault of Szisz, completely disorganizing the team. The final settlement was that Weigel, the owner and builder of the three cars, withdrew from the race and was replaced by a tester.

The number of cars being large and the road reported rather loose and dusty in places, special precautions had been taken by most of the drivers. A large proportion had their faces painted, and complete masks with but an opening for the mouth and eyes were used by many. Duray had a light wire gauze screen fitted up from the right hand side of his dashboard as a pre-

Lautenschlager, the Victorious German, in Full Mercedes Flight Near Ancourt.—Taking a Turn with Consideration for Tires.

Hemery Preparing Benz for Final Round.

ventative against flying stones. His breast was as usual adorned with Lorraine-Dietrich charms, and on the right of the chassis was a notice in English and German "Dangerous to lean out."

First Round Over 78 Miles an Hour.

A second after the Benz car driven by Erle had been sent away, the first car to finish the round roared past the grandstand at a speed of about seventy miles an hour. It was Poegge on the Mercedes, who had succeeded in passing the Englishman Resta, sent away one minute ahead of him. Before No. 48 Germain, driven by Perpere, had closed the starts, Szisz, Hemery, Lancia, Duray, and Thery had finished their first round, the excitement as the last cars left and the leading cars finished their initial trip being intense.

Thery on the Brasier and Szisz on the Renault each covered the first round in 37:06, which is at the rate of slightly over 77 miles an hour. Thus last year's record round, made by Nazzaro in 38:16, or at the rate of 75 miles an hour, was beaten before the struggle had been in progress an hour. But even better time was to be made, for when Salzer roared past the grandstands on his Mercedes he had performed the stupendous feat of covering the 47.8 miles of road, with a standing start, in 36:31, which works out at the rate of 78.5 miles an hour. The limited bore cars had already proved themselves faster than their unfettered predecessors of 1907 and 1906.

Wagner, who had started fortieth on the list, beat his team mate Lancia and his rival Thery by covering the first round in 37:13. Bablot of the Brasier car, made the second fastest time on the initial round by putting up figures of 36:40. The one other to break last year's record was Hemery's Benz, in 37:55.

Lancia's brilliant work was only of short duration. After passing the tape at the end of his initial round the bulky Italian pulled in his car at the appointed tire station, jumped off hurriedly and lifted the bonnet. There was a quick examination, a shrug of the shoulders, then ten minutes' leisurely work terminated by the car being pushed off the track into the paddock at the rear of the grandstands. Lancia's opportunity of winning had been lost through the breaking of the water pump shaft.

Hanriot (Benz) Turning at Londinieres.

Jenatzy ran in on completing his round in order to change the tires in the manufacture of which he is interested. The work was done while the engine was running, a quantity of oil taken in, and the Mors car was off again.

Nazzaro had secured first place by the time the second round was completed, and was followed at an interval of exactly one minute by Lautenschlager, the newcomer to the Mercedes racing team. Thery had third place, Wagner fourth, Duray fifth, and Minoia, the De Dietrich driver, sixth. There was surprise that Szisz, who had tied with Thery for third place on the initial round, should not come round in his expected place. The absence was soon explained, for the Renault came slowly up the road minus its left rear tire and rim.

Szisz Disabled Because of Another's Accident.

In a few hurried words the situation was explained; on approaching the hairpin turn near the Dieppe end of the course, and less than a mile from the grandstand, Szisz was suddenly flagged to stop, Poegge's Mercedes having missed the turn and gone into the fence. Under the influence of the harsh application of the brakes tire and rim flew off the wheel, the car meanwhile continuing to run along on the fixed wheel for a distance of several hundred yards. When the racer was finally pulled up it was found that the two flanges had been so flattened that it was impossible to put on a new rim. The car was run up to the grandstand on the rim, pulled up in front of its tire station, examined by Louis Renault and Chairman Rene de Knyff, then ordered to be pushed off the course, the regulations forbidding the changing of a wheel and a continuation of the race being impossible under any other conditions.

There were more surprises and disappointments in store, for the entire Dietrich team of Duray, Rougier, and Minoia soon was put out of the running in quick succession. Duray, after covering two rounds, got back to the stand on foot and made the statement that his clutch collar had seized up. Rougier's failure was magneto trouble; of Minoia nothing was heard.

Salzer, the acrobatic Mercedes driver, who furnished the record round, completed a second trip round the triangle, then disappeared. Gaubert, one of the Porthos drivers, was unable to get round one of the bends with his long wheelbase car in a satisfactory manner, ran into a wall, smashed his wheel and retired. Simons, his team mate on No. 42 Porthos, met with a similar fate during the second round. Shannon of the Weigel and Piacenza of the Itala each failed after a single round.

Wagner and Nazzaro Join the Disabled.

It was early seen that the struggle was going to be a severe one between the Benz, Mercedes, and Brasier teams, with Bayard-Clement and Renault as runners-up. On the third round Wagner (Fiat) got first place, followed by Hemery (Benz), Lautenschlager (Mercedes), Nazzaro (Fiat), and Thery (Brazier).

The proud position was not maintained for long, Wagner retiring on his fourth round, and at about the same time Nazzaro was reported as having abandoned, the trouble, according to his team mate Wagner, being also a broken crankshaft. Thus all three Fiat cars were out a third of the distance.

On the fourth round also Baras, the second Brasier driver, went out of the race as the result of the cams becoming loose on their keyways, the cams and shaft on the Brasier racers not being integral as on the touring car, in order to allow finer adjustments and changes. Laxen, the driver of No. 30 Weigel, skidded on a turn very early in the race and was unable thereafter to use any other than his third and fourth speeds. Later, while taking a turn at Eu during his third lap his car turned completely over, without, however, any serious injury to the two men.

Jenatzy, Now a Mors Pilot, Replenishing.

Hemery and His German Benz Obtain Lead.

On the completion of the fourth round Hemery, the French driver of the German Benz, was in first position, with a lead of two minutes on Lautenschlager, the Mercedes conductor. Hanriot, also on a Benz, was third, with Thery running a very close fourth. Heath, who was driving his Panhard with remarkable dash, was in fifth place, Bablot on the Brasier in sixth, Cissac's Panhard seventh, and Hautvast, Clement, eighth.

Owing partly to the forcing of the pace, and in a certain measure to the fact that the road was exceptionally hard, tire trouble was abundant. At the end of the first, second, and fourth rounds Strang put into his station to change a punctured tire and take on replacements for those lost on the course. Guichard, the mechanician of the Thomas car, showed remarkable agility by climbing out to the bracket behind the gasoline tank and unstrapping the tires as the car was running down to the station. With the single fastener Michelin rim and prompt responses from those at the tire and gasoline station the changes were all made with remarkable speed.

Tire Changing Became an Important Factor.

Tire changing being an important factor in the race, it was interesting to notice the various arrangements adopted and methods of work of the different teams installed in the dugout "ravitaillement." Renault and Panhard both had pneumatic jacks which could be put under the axle of the car and the vehicle raised in less time than it often took to place the old type in position. Dietrich had a long double lever about seven feet in length by which the entire front or rear could be lifted off the ground on one pull. Half a dozen firms maintained their gasoline under pressure in a large tank with a long connection.

The Englishmen at the Austin stand distinguished themselves by unusual slowness in making tire changes, filling tanks, etc., sometimes as much as five or six minutes being lost waiting for appliances which ought to have been at hand or loitering around for no apparent reason. In view of the fact that the cars were running excellently it was hard to understand such indifference.

Cissac's Last Appearance Before His Fatality.

Lautenschlager to the Fore in the Fifth.

During the fifth round Lautenschlager on the Mercedes managed to wrest first place from Hemery on the Benz and to secure for himself a margin of three minutes. Hemery took second place, his companion Hanriot retained third, and Thery kept in fourth position. There was now something like consternation in the French camp, for unless Thery could wear down the three fast cars in front of him victory was assured to Germany, and, in any case, the home industry would be poorly represented in the first half dozen. Heath and Cissac, each on a Panhard, were running well, but could not be expected to secure first place except by accident, and the two Renaults handled by Caillois and Dimitri were too far down to get to the front.

On the termination of the sixth round the Mercedes-Benz duel was still in progress, Lautenschlager leading by four minutes on Hemery and five minutes on Hanriot (Benz). Thery, in fourth position, handled his car magnificently, the big blue Brasier whizzing past the grandstand as if on rails, the veteran driver slipping from third to fourth speed at a fixed spot opposite the grandstand with a sharp touch of the lever.

Thomas and Its Leaky Gasoline Tank.

While the leaders were on their sixth round Strang pulled into the station at the end of his fourth round with the gasoline tank leaking badly. It was quickly filled, fresh tires taken, and a start made for a fifth round, Strang believing that he could run on gravity with his large supply and keep sufficient fuel to get around the course. In other respects the car had shown satisfaction, and, though not as fast as the Germans and French, seemed capable of going the entire distance.

Hemery managed to close up on Lautenschlager during the seventh round until the difference between the two men was barely a minute. Hanriot was four minutes behind the leading Mercedes, and Thery was ten minutes in the rear. During this round Hemery was struck in the eye by a flying stone which broke his goggles and caused some of the glass to enter the eye. Though suffering intensely and only seeing with one eye, the Frenchman stubbornly refused to allow his car to be taken over by a reserve driver. One side of his head was horribly swollen, the effect of the tarred surface and dust aggravated the evil, but still the killing pace was maintained. Lautenschlager managed to draw away from Hemery one minute and from Thery four minutes, but the respective positions of the four leaders remained unchanged during the eighth round.

Victorious Mercedes on Its Final Round.

Down in the tire and gasoline pit the Mercedes assistants were in a frenzy of excitement as the last round commenced with Lautenschlager in the lead. Before starting off on what promised to give him the victory the German ran in to change front and rear tires, replacing the smooth one by non-skids, and to take a hasty drink of coffee. With a roar from a hundred German throats the white Mercedes was off again in pursuit of Hemery, who, having started thirty minutes earlier, was still leading in position but not in time.

Hemery finished first with his left rear tire flat and his left eye probably useless for the rest of his life. But he had started earlier than Lautenschlager carrying No. 35, and had to be content with second place, nine minutes behind the Mercedes. Hanriot, who had struggled hard to wrest second place from his mate, had to accept third, less than one minute behind.

At the commencement of the last round fourth place had seemed certain for Thery; it was even imagined by his supporters that a supreme effort could be made to run up to third or second position, first place being manifestly beyond his reach

Thery (Brasier), Whose Star Was Dimmed.

except in case of accident. Henry Brasier wandered up and down the track with a worried look on his face and glancing every few minutes at the announcement board for news of the passage of his crack driver. Louis Renault strode up and down nervously and anxiously, stopping now and again to explain how Caillois had been delayed by trouble with his dismountable rims. The minutes passed, but no reports came in of the approach of Thery. The time necessary to secure first place elapsed, then the cruel truth burst upon them that Thery, long looked upon as superior to breakdowns and accidents, had met with defeat. It was not, however, until an hour later that it was learned that the Brasier car had completely broken down during the last round, a cylinder having cracked.

Rigal, who earlier had been delayed by trouble with his dismountable rims, made a supreme effort and finally brought his Bayard-Clement into the fourth place vacated by Thery. Poegge, who had undone the first Renault, brought his Mercedes into fifth place; Joerns on the Opel secured sixth place, Erle on the Benz took seventh, and Dimitri, Renault, was classed eighth.

Heath, First Vanderbilt Winner, Unofficially Ninth.

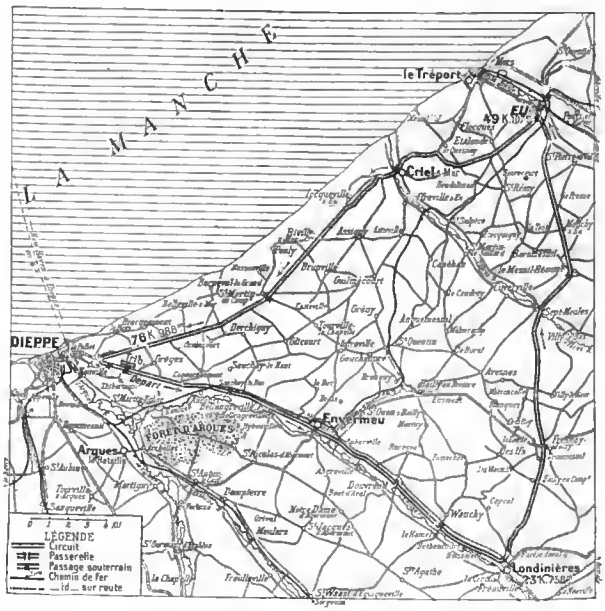
Though George Heath was unable to officially finish the race, his car took ninth position. The winner of the first Vanderbilt race had suffered severely from the effects of the tar on his eyes all through the race. At the end of the ninth round he declared that it was impossible for him to continue, and immediately Artois, who was in the gasoline station, jumped onto the road and was off with the car. During the final round the mechanic was thrown out of the car on one of the turns, the rear wheel passing over his left hand and severely crushing it.

Twenty-three out of the 48 starters finished the race, the only teams complete at the end being Benz with all three cars well placed and Mors with their two cars, sixteenth and seventeenth.

Henry Fournier, one of the several veterans who have returned to racing this year after a long absence, was delayed by tire and slight mechanical trouble early in the race, and later suffered intensely from the action of the tar on his eyes. On completing the course in twentieth position he had to be led away to the doctor, his eyesight having temporarily left him. Moore-Brabazon and Resta, the English drivers, were similarly in a pitiful condition, while Heath had to take to bed.

The Double Fatality of the Race.

A little time after the winner had been announced, and while the stands were comparatively empty, the rumor spread abroad



Map of the Triangular Course.

that Cissac, the Panhard driver who had set out in sixth position to make his ninth round, had met with a serious accident. For at least an hour no exact information was available, but about 3 o'clock the sad truth was made known that both driver and mechanic had been killed. The real cause of the disaster is not quite clear, for the only eye witness was a soldier who is able to supply but meager details. The probability is that while running on a straightaway between 80 and 90 miles an hour a front tire burst or the steering gear broke.

How Cissac Met His Unhappy End.

The spot where the accident took place was at Sept Meules, the road slightly descending and perfectly straight. The soldier declares that a tire burst, the machine swerved suddenly to one side, struck two trees, bounded to the opposite side of the road, then rolled over on itself two or three times. Cissac, who was 31 years of age, had graduated from the bicycle to the motorcycle, and from the motorcycle to the voiturette. The race in which he found his death is the first big automobile event in which he had participated.

Fournier (Italia), Who Fought Unsuccessfully.

STRANG TELLS THE STORY OF THE AMERICAN ENTRANT

DIEPPE, July 7.—"When I was given the start in fifteenth position with the Thomas car," declared Louis Strang to THE AUTOMOBILE representative, "I had nöt any hopes of capturing the French Grand Prix. Against the 120-horsepower French, German and Italian racers which had been practicing on the course for months we could not expect to give more than a regularity display with our modest 90-horsepower car, which has never been on the course before.

Louis Strang.

"On the first round we ran without incident as far as Sept Meules, about half the distance. Here at the very spot where Gaubert overturned later on his Porthos, the Thomas skidded and blew out a tire. With the new Michelin rim it was but a matter of a minute or so to slip on a new tire and get under way again. We ran around to the grandstand, picked up a new tire to replace the burst one, and two minutes later were away again in good shape.

"On the second round we unluckily blew out a tire, and a few miles farther on lost off the top of our carbureter. One of the women spectators gave us a handkerchief with which we improvised a carbureter top that allowed us to run to the grandstand where the proper part could be obtained. Guichard, who rode with me as mechanic, did everything in his power to save time on the numerous occasions we had to stop to change tires. As we were getting near the grandstand he would leave his seat and scramble out behind the gasoline tank, where the tires were rung in a shallow pan, in order to have the straps unfastened by the time we pulled up. The spectators appeared to think that he had to get to the rear in order to hold the tank together or keep the tires in position.

Where the Thomas Ended Its Fight with a Leaking Gasoline Tank.

"During the first round all the cars ran at their highest possible speed, at an excessive speed in fact, for they were not able to maintain the killing pace. Our time on the Thomas was 54:34, compared with 36:31 for the fastest car; an Itala finished behind us and one car went out through accident. On the second round, owing to the loss of the top of our carbureter, our time was slower, the lap being covered in 1:02:56. Cagno's Itala was slower than we, and eleven fell out of the running altogether.

"On the third round we blew out a tire at Mesnil-Reaume, causing a delay of a couple of minutes, and also on taking a sharp turn at high speed threw Guichard out of the car. My mechanic was fortunately thrown clear of the wheels, and on picking himself up found he was none the worse for his mishap. Stopping the car and recranking the engine caused another two minutes' delay, but notwithstanding this we finished the round in 58 minutes, being faster than Landon on the Mors, Stricker on the Porthos, Gabriel on Bayard-Clement, Opel on Opel, Dimitri on the Renault, and Fornier on the Itala.

"The only exciting incident of the race, for us at any rate, occurred near Griel on our fourth round. At this spot a racing car which I believed to be one of the English Weigels had struck a tree and overturned, the tree being thrown across the road and the car to one side. The commissioners had called the soldiers to their aid in removing the tree, and in the meantime had flagged all cars. Just as we got there the obstruction had been removed, though two cars still stood on the roadside. The forward car was some French machine, the number of which I could not distinguish, the rear one was Fournier's Itala.

"When I saw the obstruction I was running wide open, the machine romping along at about 80 miles an hour, a speed that made it impossible for me to shut down in time. There was room for me to pass, for Fournier was standing behind the French car, and I consequently pulled out more to the left and rushed ahead. As I was approaching, however, Fournier hastily looked round, evidently thought he had time to get ahead of the French car before I arrived, and started to move along. He had either overestimated his power of getting away or had miscalculated my speed, for when the Thomas ran up we were all three abreast on a narrow road. Fournier pulled in to the standing car as closely as possible and I swerved out on to the grassy bank, went thumping along for several hundred yards and pulled up half a mile ahead with a burst tire. As Fournier went past me he indicated by signs that he had made a mistake in cutting in on me. Fortunately there was no other damage than the burst tire, but the escape is one of the closest I have ever had during my racing career. On this round our time was 57:01.

"There had been no trouble whatever with the engine; the only occasion on which we had lifted the bonnet was to replace the top of the carbureter. The first and second gears had seized just before we started in the race, but this did not hold us down in the least, it being possible to start away on the third and take all the hills on this gear.

"While finishing the fourth round Guichard discovered that the gasoline tank was leaking. We stopped at the tire station, cut out the pressure in order to preserve it for the oil and prepared to run on gravity. As the tank was exceptionally large we imagined it would be possible to run in this way and fill up each round. Instructions were therefore given to the helpers to be ready to give us gasoline on every lap.

"We ran along without a miss until we reached Londinieres, when, just as we got into the dangerous 'S' turn where the Renault and the Brasier turned over last year the gasoline ceased to flow to the carbureter. Coming down the winding road the tremendous thumping or the roll of the gasoline as it swung from one side of the tank to the other had strained the end still further until the fuel was running out in a steady stream. The 'S' turn is followed by a long winding ascent that we could not possibly climb with such a low level of fuel. The car was then standing in a very dangerous position owing to the peculiar nature of the bend and the high banking; racers coming round the corner were in great danger of running into it. We therefore applied to a commissaire for help to push it into a more exposed position. A dozen soldiers were sent on the road to help push the car slightly up the hill. We had a car perfectly fit in every respect except for the leaky tank."

SINGLE-CYLINDER 50-MILES-AN-HOUR VOITURETTE WINNER

DIEPPE, July 6.—If there had been a little more internationalism in the event and no momentous Grand Prix to overshadow it, the voiturette race held to-day would have stood forth as an excellent sporting affair. Unfortunately all the starters, with the exception of two teams were supplied by home firms. Still more unfortunately for the foreign visitor and the casual automobilist, not more than ten per cent. of the drivers had ever been heard of in a racing capacity before, so that interest in the event was purely French.

The winner of the first voiturette Grand Prix was found in M. Guyot, who was the first to shoot over the starting line on a Delage one-lunger, and was the first to finish the race.

Six times in succession, without a stop of any kind whatever, the little single-cylinder car of less than four inches bore traveled round the triangle at an average speed of slightly more than 50 miles an hour. To be exact, his time for the 285.2 miles was 5:45:30 1-5, which works out at the rate of 50.02 miles an hour. Two years ago the suggestion of such a speed would have been laughed at as an impossibility; to-day it was expected, and when it was made, it was no surprise.

Second place went to Naudin, one of the favorites, who finished on his Sizaire-Naudin single cylinder car seven minutes behind the winner. Third and fourth places went to Lion Peugeot, and fifth again to Delage. All three Delage cars finished, and finished so well that they secured the regularity prize with 18 points. Lion Peugeot was second best on team performance with 22 points; Sizaire-Naudin coming tbird with 29 points. No other teams made all six rounds of the course complete.

Guyot and Delage Voiturette Winner.

The result of to-day's race has been a complete triumpb for the single-cylinder car, which has been revived with considerable enthusiasm in France during the past two years. The few two-cylinders failed to make a showing. Isotta-Fraschini, Martini, and Rolland-Pilain each furnished three four-cylinder cars of the very highest class which looked good, ran well and sounded healthy, but which failed altogether to show the speed abilities of the more noisy single cylinders. For very small bores there are considerable mechanical difficulties in the construction of four-cylinder engines, and it is certain that with a limited cylinder area more power can be obtained from a single than from a multiple cylinder engine. In their own way the baby racers were every whit as regular as any of the 100-horsepower flyers which have been put on a European circuit and afforded as close finishes as will probably be seen in the greater race to-morrow.

There was some disappointment through the failure of the favorite team, Sizaire-Naudin, to make a more satisfactory showing. After winning the voiturette races two years in succession, Sizaire-Naudin built three ingenious and remarkably fine cars which were certainly the fastest of the lot on a short stretch, but which failed to give the best results on the long run. It was a severe weeding out test that the baby racers were put to, the hard, well-beaten-down road surface subjecting the small cars to severe vibration that soon told its tale in weakened mechanism. Before half the race was over there were a number of cars which could be seen struggling along painfully, the terrible strain of fifty miles an hour shaking the life out of them and making it impossible to continue.

Accidents were five in number, due doubtless to the inexperience of the drivers, but ending without any very serious results. Martin, driving the No. 7 Demesteer, left the road, overturned, was wounded on the head, and had to be carricd to Eu hospital; the Truffault, of shock absorber fame, ran into the bridge at Ancourt, the result being a severe shaking for the driver and a shortened career for thc car; No. 24 Guillemin-le-Gui turned over on a bend; an Aries smashed a wheel and ended its racing life in a field; No. 50 Martini was ditched by Driver Sanvico. Considering the number of cars and the fact that many of the drivers had not previously been in a pure speed contest, the list of accidents is satisfactorily small. The public was too well protected by stout barricades and lines of soldiers to ever be in any danger.

H. S. HOUPT ON THE RACE.

"Soon after reaching Dieppe," said Harry S. Houpt, manager of the Thomas entry, "I realized the very thorough manner in which the French, German, and Italian firms prepare for racing, and also saw that even with engine limitations their 1908 cars were faster than those of the previous year. With power well under a hundred and all of our rivals over the century mark, it only required slight calculation to understand how meager were our chances of being in the first dozen.

"Bue we went to work determined to do the best possible with our remodeled stock car, hoping to demonstrate reliability if nothing more. While the Thomas was pugnaciously covering four laps, interrupted by frequent tire troubles, there were some noted cars and drivers which disappeared from the scene. If Strang's gasoline tank had not been wrenched and sprung a leak I am confident that we would have finished the ten laps inside the time limit.

"We have learned much of the needs in racing an American car in Europe, and our experience will be very valuable."

SUMMARY OF THE VOITURETTE RACE.

No.	Car	Engine	Driver	Time
	DELAGE	1 cylinder De Dion.	Guyot	5:45:30 1/5
2	SIZAIRE-NAUDIN	1 cylinder	Naudin	5:52:06 3/5
3	LION PEUGEOT	1 cylinder	Goux	5:58:00 1/5
4	LION PEUGEOT	1 cylinder	Baillot	6:05:25
5	DELAGE	1 cylinder	Thomas	6:18:50
6	THIEULIN	1 cylinder	Viton	6:26:44
7	ALCYON	1 cylinder	Barriaux	6:32:37
8	ISOTTA-FRASCHINI	4 cylinders	Mazerati	6:36:39
9	SIZAIRE-NAUDIN	1 cylinder	Lebonc	6:36:57
10	MARTINI	4 cylinders	Beck	6:37:28 1/5
11	THIEULIN	1 cylinder	Schwoot	6:38:40 3/5
12	DELAGE	1 cylinder	Lucas	6:38:52
13	WERNER	1 cylinder	Vallee	6:40:37
14	ISOTTA-FRASCHINI	4 cylinders	Buzio	6:42:38
15	LION PEUGEOT	1 cylinder	Giuppone	6:50:40
16	ROLLAND PILAIN	4 cylinders	Louison	6:51:28
17	GUILLEMIN-LE-GUI	1 cylinder	D'Avaray	6:58:46
18	SIZAIRE-NAUDIN	1 cylinder	Sizaire	6:58:48
19	WERNER	1 cylinder	Molin	7:02:02
20	OASI GREGOIRE	2 cylinders	Gaste	7:17:03

THE UNIT SYSTEM OF POWER TRANSMISSION

By FRANK BEEMER, Member Society of Automobile Engineers.

PERHAPS one of the most serious problems that confronts the average automobile engineer in America and Europe to-day is the best and most economical way of transmitting power. There have been a large number of experiments made in various types which are commonly known as the transmission axle, the results of which are in favor of this so-called unit system. There are quite a number of reasons why this system should and does save considerable power.

First—That it requires but one universal joint, either single or double. This is one of the points which, most engineers agree, consumes considerable power, while the driving at various angles of the propeller or cardan shaft, through two or three universal joints is also very undesirable. This transmission applied on the rear axle allows the universal joint to be placed immediately back of the clutch and a considerable distance forward of the point where it would be placed in a car, with the transmission carried on the sub-frame, thus reducing the angularity of the propeller shaft to a minimum, and in most cases bringing it practically on a straight line with the crankshaft.

Second—The transmission and differential mechanism being placed in a single housing makes it very easy to have it in perfect alignment; this is one of the features that has proven from all experiments, to be the principal factor in the saving of power. It is quite necessary, and has been recommended by all ball and roller-bearing authorities, that to obtain the best results from the use of any type of anti-friction bearing it is absolutely necessary that the bearings be in perfect alignment. This question has been taken up in a very practical way, and it has been found that the unit system of power transmission permits freer action to the bearings, thus reducing the effect of the abnormal shocks and vibration to the bearings.

Efficiency Is Greatly Increased.

The tests that have been made of this system of transmitting power show a saving of from 16 to 20 per cent. of the power applied, or, in other words, it utilizes this much more power at the driving wheels, in the ordinary designs, this amount being consumed by universal joints, angularity of cardan shaft, disalignment of bearings, and many other sources of imperfection which are more easily taken care of in the transmission type of axle than in the various types of plain axles commonly used.

The automobile buyer of to-day in most cases considers very carefully the simplicity of the car, more than its style or appearance. He is not repeating the troubles which were experienced in the early days of automobiling, when many purchasers endeavored to secure a car which, in plain language, consisted of the greatest number of pieces for the money. It is a well-known fact that where the acme of simplicity lies is the maximum of durability and that means a minimum number of parts.

The automobile equipped with the unit system of power transmission has been taken by many reliable engineers as a parallel to the direct-connected power set or unit found in the latest power plants, having the engine, which corresponds to the automobile motor, and the generator, which is the equivalent of the transmission devices. This has been found to be the most practical and economical method of producing electricity, and it is this idea, carried out, as herein described, that forms one of the most economical ways of transmitting the power of an automobile motor to the road wheels through a system based on mechanical principles. It should appeal to most engineers as being one of the best and most practical methods of obtaining the result desired, as it shows a very high efficiency.

The saving of power, as above stated, is based principally upon hill-climbing tests which were made with several cars equipped with the unit transmission system. I have been present at a number of these tests, and have driven some of these cars, which were equipped with the transmission on the sub-frame, and have noted carefully the working of all parts of the car. I have also taken the same cars equipped with the transmission axle and in repeating the same tests have found that there is a very considerable increase in both speed and ease with which the motor will handle the car on the same hills.

I have also made certain speed tests with a car, with all parts in good condition. The motor at its very best was unable to secure on good roads more than 40 to 45 miles per hour, while the same car equipped with the transmission axle and with all conditions as nearly alike as possible, would develop, with ease, 55 miles and even as much as 60 miles per hour. These and other efficiency tests tend to prove that the unit system of power transmission is without question one of the long-looked-for improvements in automobile design.

There are a number of arguments advanced in favor of the side chain drive for heavy cars. A car equipped with this drive, all adjustments being as correct as they were when leaving the manufacturer's hands, or as they were intended to be by the designing engineer, will prove efficient to a certain degree. There are, however, a number of annoyances connected with this system of propelling a vehicle that are very unpleasant, the principal one being the noise caused by the chains. It is essential, in this design, to have what is commonly called a radius rod to insure the proper distance between the centers of the sprockets. These are frequently adjusted to different distances, causing the chain to ride on the side of the sprocket, adding undue wear.

Protection a Most Important Factor.

There are a large number of cars equipped with this system that are not provided with cases to protect them from dust and dirt, which quickly cause an extreme amount of wear, as the accumulation of dirt upon these parts absorbs the oil or grease used for lubrication, and it is only a matter of a short time until the correct pitch of the sprocket and chains is destroyed, and it is at this time that the greatest inefficiency must arise. I have also noticed on a number of chain-driven cars, owing to the improper adjustments of the radius rods, that the rear axle does not set square or at right angles to the center of the car, which causes friction and undue strains upon the bearings, sprockets, chains, as well as excessive wear on the tires.

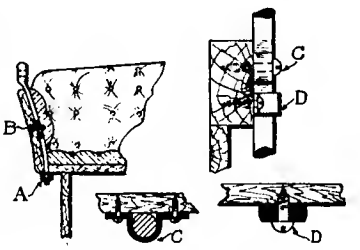
While we have a few of these discrepancies in the bevel-gear drive, it must be conceded that all the gears and other parts of the construction are properly protected from dust and dirt, and that at all times it has a sufficient amount of lubrication, which not only adds to the life of the parts, but reduces the friction, especially when working under excessive strains. Quite a large number, if not all, of these imperfections have been overcome in the unit transmission system, and the last, but not least, important feature of this system is the silence with which it transmits the power. I should say that it is physically impossible to obtain as quiet a running car with either the side-chain drive or with the car equipped with the transmission on the sub-frame and using the plain type axle, as it is with the unit system as has been herein described.

[The presentation of Mr. Beemer's paper at the Detroit meeting led to an interesting discussion during the course of which many points of value were brought out, the subject of power transmission on the automobile being one of vital import to the progressive designer. Among the engineers present were those who favored both sides of the question set forth as shown by their cars, some of which have adhered to the transmission axle and others to the subframe construction for several years. Written discussions on this very interesting subject were promised both *pro* and *con* and will appear later.—Ed.]

* Paper read before the Society of Automobile Engineers on the occasion of its Third Annual Summer meeting for 1908, held in Detroit, June 25-27.

GOOD POINTERS FOR THE AMATEUR REPAIRMAN

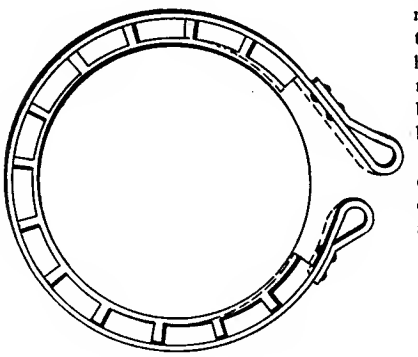
CAPE cart hood irons are sometimes attached to the front seat as illustrated, which indicates the appearance inside the arm of the front seat with the upholstery stripped away. The lower end of the iron goes through the overhanging part of the seat, and the nut, A, is on the outside. The iron is steadied by an ordinary wood screw, B, which goes into the framing of the arm. If the iron is curved as the sketch shows, there is a considerable leverage on B, tending to break it off. If it breaks, the free movement of the arm tears the upholstery. A permanent job can be made by drilling the hole through which B passes and putting in a slightly larger screw, C, and also putting on a strap, D, beneath it. This strap, D, then does the greater part of the work, and has the effect of causing any twist applied to the iron to be held by the screw, C, where it enters the wood, instead of exerting a leverage against it just under the head.



Details of Ironing for Cape Top.

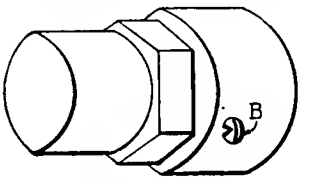
About Fitting New Brake Bands.

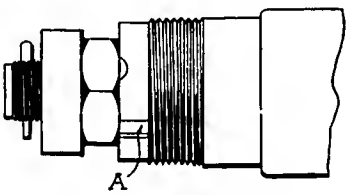
Brake bands having cast iron or brass shoes riveted to sheet steel bands expand and contract through a very small diameter, and when new they must be very carefully fitted to the brake drums or they will drag and heat. As one cannot depend on their being bent to precisely the right diameter, when they come from the factory, it will save time to test this point before putting them in place. This is easily done and with sufficient accuracy by drawing a circle on a board and laying the new bands over this circle to see how nearly they match. If the brake drums can be calipered the circle should be of the same diameter as the drums, and the bands should clear this circle somewhat as shown exaggeratcd in the illustration, since the principal bending of the bands will be at the bottom portion. This applies if the weight of the bands is supported clear of the drums. In some cars this is not the case and the upper portions of the shoes rest constantly on the drums. This requires these upper portions to be bent downward slightly, to almost their gripping position, as indicated by the dotted lines in the upper part of the illustration.


How the Brake Band Should Lie.

How to Lock a Loose Hub Cap.

A hub cap, particularly of a plain bearing car whose hubs are greased instead of oiled, will unscrew rather easily if its threads are a loose fit. This is particularly the case with the right-hand hub caps, since the viscosity of the grease results in a constant effort to unscrew them. As good a way as any to lock the cap is to chip the notch, A, in the flange of the bronze bushing in the hub, and to arrange a set screw in the cap to enter this notch. If the set screw is of the ordinary hardened sort and holds only by its own pressure, it is liable to shake loose some time or other. A better plan is to use a button head ¼-20 screw of ordinary steel, running the threads clear up to the head by means of a die. A notch is filed in the head of the screw, as shown at B, and the screw is cut off to such a length that the head will bottom on the cap when the end of the screw enters the notch A, then a burr is raised at B in the brass of the cap with a prick punch; thus the screw is secured against turning until it is wanted to do so. The same expedient is useful in many other places where it is desired to keep a screw from loosening in service.



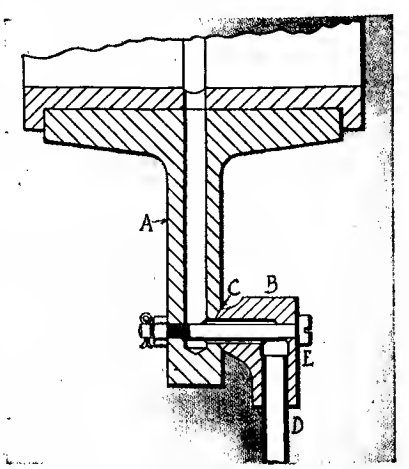


To Lock a Hub Cap in Place.

A Permanent Oil Pipe Connection.

The ordinary pipe fittings are not always reliable for oil and gasoline pipes subject to vibration, and where the failure of a connection would involve serious consequences, as in racing engines, a better form of connection is desirable. The illustration shows a special form of union devised by Crane & Whitman, of Bayonne, N. J., for important oil pipes. It is shown in service carrying oil to the under side of a main shaft bearing. The bottom cap A of the bearing is deeply ribbed and the oil duct is drilled in the rib. The connection itself takes the form of an L-shaped steel union B having a ground seat at C and brazed to the oil pipe at D. A special screw E passes through the union and is threaded into the further side of the rib. The oil goes around the screw, and a lock nut and cotter pin insure against coming loose under even the most strenuous conditions of service.

Should an oiler reservoir begin leaking where one of the oil leads attach to it, the only suitable solution is the immediate soldering of it. The use of adhesive tape will sometimes suffice for a time, but the vibration generally renders it a poor repair. A small soldering iron is a most valuable part of a repair kit, and with it a soldering repair can be made in less than 20 minutes. Oilers have been taken off, a fire built by the roadside and the soldering done in less than 15 minutes, but the amateur who has not been accustomed to handling a soldering iron can hardly expect to do as expeditious a job as this, for, though a simple tool, considerable knack is required.



To Prevent Breaking by Vibration.

LETTERS INTERESTING AND INSTRUCTIVE

THE IRREPRESSIBLE QUERY COMES UP AGAIN.

Editor THE AUTOMOBILE:

[1,464.]—Is there some engineer, designer or an authority on gasoline engines that will explain to a novice who is having his first experience with a single-cylinder car, in language that I can understand, why it is that a weak, or, as it is termed by some, a lean mixture, gives carbureter shots in a four-cycle engine?

Williamsport, Pa. NOVICE.

While the question does not appear to be aimed at us directly in this instance, we will attempt to assume one of the three roles mentioned and try to fulfil the qualifications as set forth. Bearing in mind that the mixture is the fuel of the engine, and that as in a stove, the character of the fuel influences its manner of burning, it will be evident that like poor wood, slaty coal, or other imperfect fuel, a weak mixture is a slow burner. This is point number one. Proportionate to the speed at which it is running, the motor has a certain sharply defined period of time in which it must complete each part of its cycle, if it is to operate satisfactorily. Should the parts of the cycle lap, or run over into one another, there is bound to be a hitch of some kind. The use of a very weak mixture causes just such a hitch by reason of the fact that it continues burning for some time after the completion of the part of the cycle during which it is supposed to function, *i. e.*, the power stroke. In fact, it is still burning when the inlet valve opens to take in a fresh charge, and as its burning in the cylinder maintains considerable pressure therein, the latter, on the lift of the inlet valve, escapes through it and the carbureter with a pop, exactly similar to that of an unmuffled exhaust except that it is weaker. The remedy is more gas or less air, or sometimes both, and to find out just how much of each is required, start the motor and very gradually cut down its gasoline supply at the needle valve of the carbureter until the motor begins to miss. Then as slowly increase the supply until the motor will run steadily and without missing on the minimum opening of the needle valve. Lock the latter in place. Then speed the motor up by opening the throttle and adjust the spring of the auxiliary intake on the carbureter until the motor is receiving sufficient air to enable it to run and develop plenty of power at all speeds. Our columns are thrown open to all and any who can be more explicit and still brief on the subject without going into technicalities or language not understood by the untechnical.

CAUSE OF A MYSTERIOUS NOISE.

Editor THE AUTOMOBILE:

[1,465.]—I own a Mitchell roadster. The car runs good on a level or up grade, but when I throw the clutch out with my foot there is a clashing noise somewhere. It seems as if the noise came from the transmission case, but I examined that while running and standing still, and I do not locate the noise. If you can help me with this through the columns of "Letters Interesting and Instructive," I will appreciate it. Yours very truly GOODWILL.

Greencastle, Ind.

It seems quite probable that the noise may be caused by the striking or interference of some of the parts of the clutch-operating mechanism, when the latter is worked to disengage the clutch, or again, some one of the parts may have loosened up sufficiently to permit it to strike the frame or a brace when the clutch is disengaged. Remove the footboards and watch the operation of the different parts between the pedal and clutch itself when operated with the car under way. If not in the operating mechanism, the trouble may probably be found to lie in the clutch itself, and this seems more likely, as contact by the spinning male member with some stationary part that has gotten out of place would be very apt to give rise to a noise similar to clashing. If any of our readers have had a similar experience on the same make of car, we would be pleased to learn of the remedy they applied.

PROPER SIZE OF EXHAUST MANIFOLD.

Editor THE AUTOMOBILE:

[1,466.]—I have an old four-cylinder engine, bore 4 1-4 inches, but the exhaust piping does not seem to be much more than 1 inch in diameter. It is a smooth, wrought-iron pipe and gets very hot when the engine has been running for any length of time. What is the cause of this and what can be done to remedy it?

Morristown, N. J. AUTOIST.

Both valves and manifolds that were very much too small for the bore of the motor constituted grave defects of some of the early multiple-cylinder automobile motors. The exhaust outlet, or manifold, that you speak of is very much too small for the size of the motor. It must be borne in mind that at the end of the power stroke the gases have been expanded to many times their original volume, so that a much larger pipe is required to carry them away quickly than is necessary to conduct the cold gas to the cylinder before explosion. These gases are still at a very high temperature when exhausted and unless disposed of very rapidly they naturally overheat anything that they come in contact with. Such a small manifold is also responsible for putting back pressure on the engine and causes a loss of power. It has been noticeable in the past few years that several designers have adopted exhaust manifolds cast with cooling flanges in order to insure as quick a drop in the temperature as possible. Some of these manifolds are really intended to act as mufflers and are made quite large. As a matter of fact, the size is only limited by the weight and appearance and the aim is usually to make the outlet as large as possible within these limits. If you will use a 2-inch wrought-iron pipe as a manifold it should make a great improvement and will certainly overcome the heating you speak of.

EXPLAINING THE "LEAD" GIVEN INLET VALVES.

Editor THE AUTOMOBILE:

[1,467.]—After having threshed the thing out at some length between ourselves, we have decided to refer the matter to a higher authority for settlement. The bone of contention is the practice of giving the inlet valve a "lead" in the modern high-speed automobile motor. My opponent contends that such a thing would not be possible as if the inlet valve were held open after the piston had passed the dead center and began to rise on the compression stroke a considerable part of the gases would naturally be forced back into the manifold and the power of the motor would accordingly be reduced. On the other hand, I contend that this is not so and that it is, moreover, quite common practice to give the inlet valves a rather considerable lead, as I have actually found this to be the case through examining the motors while in the course of dismounting or reassembling them. I have been told that this is done to insure the filling of the cylinder with the greatest amount of charge possible, and I believe that this is the reason, but do not know just why it should be so. Will you kindly shed a little light on the matter? HENRY EDGREN.

Fort Worth, Tex.

This appears to be a matter that forms quite a puzzle to many who are not familiar with the internal workings of the automobile motor. The higher the speed of the motor the greater the necessity for giving both the exhaust and the inlet valves what has come to be known as a "lead," in that they open before the completion of the particular part of the cycle that they are intended to perform. It must be borne in mind that time is required to set a thing in motion and to stop it, regardless of its form or weight, and this is true of a gas, which has inertia the same as other substances. Further, an appreciable period, though very short indeed, is required for the creation of the vacuum in the cylinder. The gas does not rush into the combustion chamber the moment the inlet valve opens; the piston must have traveled downward a bit before this takes place and the column of gas then rushing in attains an increasing velocity as the piston approaches the lower center. In fact, it is at its greatest

speed when the piston reaches the lower dead center so that the first part of its return travel has little or no effect on the incoming gas, which accordingly continues to pour into the cylinder, until the piston reaches a point on its upward stroke, where its compression is sufficient to overcome the inertia of the stream of gas, and this is the point at which most designers of high-speed engines set the inlet valve to close, thus permitting of the suction of the greatest possible quantity of fresh gas.

ADVANTAGES OF AN EXTREMELY LONG STROKE.

Editor THE AUTOMOBILE:

[1,468.]—I am an advocate of the horizontal opposed type of motor with its slow speed and easy action, and think it is ideal for automobile work. I have owned no less than three of the two-cylinder cars of this style and have never found that the lack of the extra cylinders handicapped me either in getting there or in arriving with all the speed that the law allows. I understand that both weight and lack of room are factors that enter into the question, but I would like to know why it would not be possible to greatly increase the length of the stroke of the average motor of this type, thus further reducing its speed and increasing its power at the same time. Would this not make a much more durable and easy running engine than is now the case and would its advantages not be sufficient to more than offset its drawbacks?

New Britain, Conn. J. H. H.

You are evidently proceeding on the assumption that where a little bit does a great deal of good a large dose will be bound to effect an immediate and absolute cure. As in medicine and many other things, following this plan works out by abruptly terminating all further necessity for experiment. Within certain closely defined limits an increase in the length of the stroke, thus making it exceed the diameter of the bore slightly, is a great advantage, but carrying it further results conversely. It must be borne in mind that the weight of the motor increases at an extremely rapid rate, with every addition to the length of the stroke, and furthermore, that the point beyond which it is no longer advantageous to expand the charge is very quickly reached. The hot gases of the burning charge present on the power stroke of the internal combustion motor cannot be compared with steam, as they undergo an extremely rapid drop in pressure and temperature, so that so far as any real gain is concerned the last part of an extra long stroke is practically wasted. As already mentioned, the factor of weight is by far the most important. It would mean something like 150 to 250 pounds additional to put 2 or 2 1-2 inches on the stroke of the average cylinder of a two-cylinder horizontal opposed engine of 5 inches bore, and the actual gain would be very slight, if, indeed, the extra load does not offset it entirely.

MORE ABOUT FRICTION TYPES OF DRIVE.

Editor THE AUTOMOBILE:

[1,469.]—Noting the inquiry of a correspondent in regard to the merits of friction-driven cars on steep hills, etc., I beg to ask your opinion as to the comparative merits of friction drive and other forms of transmission. Which form would deliver the largest percentage of power at the drive wheels? I believe this column in this papsr is of great value to your subscribers.

Mankato, Minn. X MINNESOTA.

Concerning the relative merits of the friction as compared with other types of power transmission on the automobile, we would refer to letters which have recently appeared in these columns under a similar heading. Where its relative efficiency is concerned, it is well known that for certain power purposes where the load is constant and uniform that the friction drive shows a high efficiency and is very practical. Unfortunately, however, such conditions do not obtain on the automobile. It has been shown by an authority on the subject that where the slip exceeds 4 per cent. the drive falls off considerably in efficiency and as the conditions of service in automobile work are about the worst imaginable, it would appear to be difficult to prevent this. The load is never constant for any length of time and it is about as far from being uniform as it possibly can be. Still the friction drive has proven considerable of a success on a number of light cars, and the experience of the manufacturers of the latter would seem to show that even under such very adverse circumstances as the necessity for pulling a car out of a hole, or starting from dead on a very steep hill, the friction drive has been able to acquit itself with credit.

GETTING MORE POWER FROM AN OLD AUTOCAR.

Editor THE AUTOMOBILE:

[1,470.]—For the benefit of your readers I would like to give my experience for four years with a two-cylinder Autocar.

The first year I was disappointed in the power, but not in the reliability of the car. The second year I had trouble which took nearly the whole season to locate, and here lies the point of my tale. The car could go sometimes and not others, one cylinder was much weaker than the other and likely to stop at any time. I tried everything but finally traced the trouble down to the inlet valves, which are of the suction type, not positively operated, and found that weaker valve springs helped some and this led to the discovery that the shoulders on the valve steme had worn away, allowing the valves to open so far that the suction could not maintain the opening and the valves fluttered during suction stroke. A pair of washers on the valve stems limiting the opening to less than a quarter of an inch completely cured the troubles.

Third year I had my company make cylinders half inch larger in the bore, which increased the power nearly 25 per cent. Fourth year put plates five-sixteenths of an inch thick on the inside of the cylinder heads, raising the compression to a point just short of premature ignition, giving a full 10 per cent. increase in power.

Fifth year ran six dry cells in series instead of four, which gave increase in power. The car seems now to have plenty of power and takes all ordinary hills with four passengers quite easily. I am sure it will pay anyone still using a 1904 Autocar to see to the suction valves and to raise the compression, even if it is not considered advisable to go to the expense of enlarging the cylinders. I wish to take this opportunity to say that the car has stood four years of banging over all sorts of roads and is to-day good for another four.

Amherst, N. S., Canada. A. G. ROBB, Manager Atlantic Auto Co., Ltd.

A GOOD ONE FOR THE IDEAL CAR SEEKER.

Editor THE AUTOMOBILE:

[1,471.]—Referring to letter 1,446, we build a limited number of six-cylinder care of the following specifications: Cylinders, 3 7-8 by 3 1-2 inches; wheelbase, 110 inches; shaft drive to Cameron patented combination rear axle, and selective type gear-set; rear axle, floating type; rear springs, full elliptic, 1 1-2 inches wide, 34 inches long, with rebound clip on each leaf; front springs, three-quarter elliptic, 1 1-2 inches wide; upper half, 17 inches long, lower half, 34 inches long; all springs five-leaf in each section; wheels, light artillery type with quick detachable 32 by 3 1-2-inch tires; body, four passenger, side entrance, of light construction; annular bearings throughout, with exception of the motor; weight complete, 1,700 pounds; ignition, high-tension magneto and batteries; speed with full load, 60 miles an hour, or geared to a top speed of fifty (50) miles per hour when specified. The motor is, of course, our air-cooled type.

If your correspondent (C. W. L., Norwich, N. Y.) thinks this car might be near enough his ideal to desire further information, we should be very glad to supply it.

Beverly, Mass. CAMERON CAR CO., H. W. ROHERTY, Sales Mgr.

ANSWERING THE IDEAL CAR PURCHASER.

Editor THE AUTOMOBILE:

[1,472.]—We note in your "Letters Interesting and Instructive" query No. 1,446, in the July 2 issue. Would state that we are making automobiles very near specifications as follows:

Engine, four-cylinder, 5 1-16 by 6; weight, 300 pounds; engine placed crosswise in middle; shaft drive to floating type rear axle; platform springs in front; scroll elliptic in rear; wheels, artillery type; tires, 36 by 3 1-2, quick detachable; weight, 1,900 pounds.

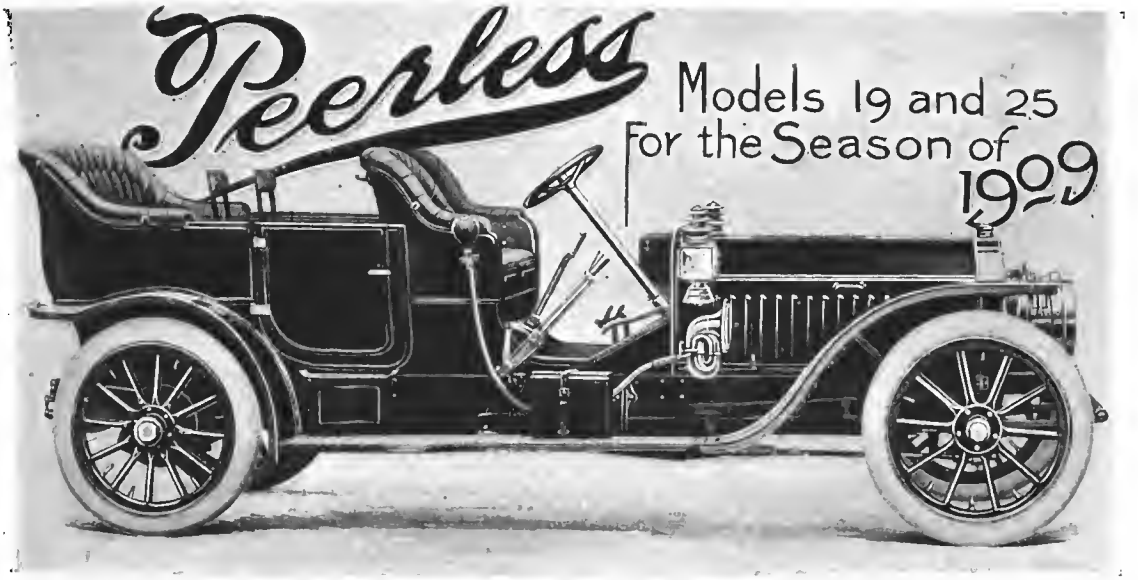
Council Bluffe, Ia. L. P. MADSEN.

ANOTHER OFFER FOR THE IDEAL CAR BUYER.

Editor THE AUTOMOBILE:

[1,473.]—In the issue of "The Automobile" of July 2 we noticed a letter from Norwich, N. Y., signed by C. W. L. The letter in question bears the caption, "Buyer Looke for His Ideal Car." In this connection, we beg to call attention to our new six-cylinder Model L car, which sells for $3,000. Upon examination of the specifications, I think C. W. L. will find that this is the car he wants.

Buffalo, N. Y. E. R. THOMAS MOTOR COMPANY, F. L. Faurote, Adv. Mgr.



The Six-cylinder Peerless Presents Artistic and Attractive Lines in Design.

TWO models will be manufactured by the Peerless Motor Car Company of Cleveland, Ohio, for the season of 1909, say the makers, and the appended description of the newcomers is practically a verbatim reproduction of their advance sheet—material that is but infrequently available in its original form, owing to the publicity man indulging in too free flights of fancy in describing the car's advantages. "These models are styled Model 19 and Model 25. The former model is rated at thirty horsepower and is a four-cylinder car, while the latter model is rated fifty horsepower with six cylinders. These two models will be ready for delivery early in September.

"The changes for 1909 Peerless cars are in no way radical, but are such as to secure a refinement and improvement in some respects of the already satisfactory 1906, 1907 and 1908 models. The principal changes are: An increased wheelbase, which provides for a greater distance between the dash and front seats, for a slightly lengthened engine hood, and allows for setting the radiator further back on the frame than on the 1908 models; improved front and rear fender design, with increased clearance for wheels; new adjustable universal shaft connections between clutch and transmission; improved universal propeller shaft driving joints, as well as a new and improved universal coupling between live axle and differential; a new style silent running water pump; a method of lubrication.

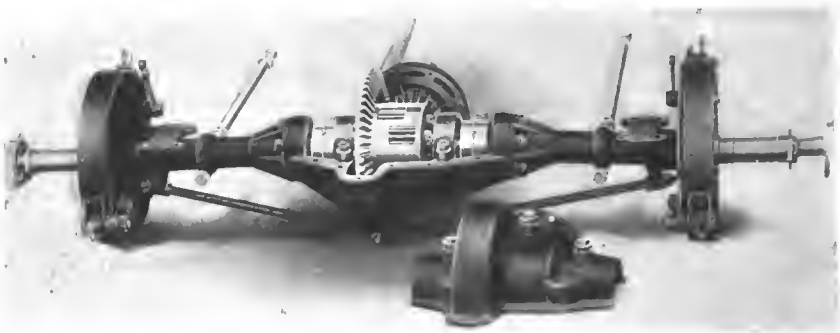
"Especial attention has been directed to the design and construction of each one of the universal driving joints throughout the car, and important improvements have been achieved, both in respect to strength and wearing qualities. The cylinder dimensions for the new Models 19 and 25 are 4 7-8-inch bore and 5 1-2-inch stroke. The cylinders are cast in pairs, with offset intake and exhaust valves on opposite sides, and are carefully bored, reamed, ground, and then lapped out with a special polishing preparation with pistons and rings in place, all of which secures perfect compression and insures a motor that will run very smoothly.

Simple Form of the Peerless Clutch.

"The water jackets are spacious, allowing the greatest freedom for water circulation throughout the motor. These jackets taper so that the greatest amount of water is at the top, which is the point of highest temperature. The large openings over the water jackets provide for a careful and certain removal of core sand, and are covered with brass plates. The crank case proper is a single aluminum casting, designed for lightness and strength. Access to connecting rods and bearings is through aluminum hand hole plates on the bottom of the crank case. Each of these hand hole plates is fitted with a patented device, which consists of a deep pocket or groove at its lowest point, into which drops any dirt or sediment from the oil.

"The crankshaft is a solid one-piece drop forging, heat-treated and ground accurately to size. The front bearing is an annular type ball-bearing, fitted with a stuffing box to prevent leakage of oil. The rear bearings are of large size, provided with oil grooves and pockets so that they are constantly flushed with oil by splash from the crank pits.

"Every gear of the motor is housed in an oil-tight compartment of the crankcase and runs in oil. By housing all gears an almost noiseless motor is secured and the wear of the working parts reduced to a minimum. The intake and exhaust valves are made of an imported special alloy valve steel, and are taper-seated, mechanically operated and interchangeable. The carbureter is automatic in its action and provides a suitable mixture for varying motor speeds. A patented double seated throttle is used, admitting the mixtures to intake pipes through both seats, so that there is no suction force to overcome, and consequently the throttle is controlled smoothly and evenly under the varying conditions of load and grade. The throttle is controlled by a hand lever on the steering wheel, by foot accelerator pedal and by a governor located on the water pump shaft, the latter being automatic.



Assembly of the Peerless Rear Axle Driving Unit.

"A mechanical oiler, gear driven, is located on the exhaust side of the motor, and supplies oil to each cylinder and to the compartments of the crankcase. The oil reservoir is cast integral with the aluminum crankcase and holds over one gallon of oil. The oil is pumped from the reservoir to adjustable sight feeds located on the dash in constant view of the driver. The crankcase compartments are supplied with oil from the oil pump through sight feeds as described, and in addition thereto may be replenished by means of a hand pump, which is made a part of the oil reservoir. This pump is fitted with an indicator so that the oil may be directed into any one of the compartments at will. The level of the oil in the crankcase compartments is regulated by means of standpipes extending upward through the bottom cover. These standpipes are fitted with petcocks underneath the car, which, when opened, determine the proper oil level in the compartments.

"The radiator is the well-known Peerless design (patented) of the same construction as used in 1908, and of ample size to properly cool the motor under the most trying conditions of service. The circulation of water is affected by a herringbone gear pump, which is silent in its operation and highly efficient. The fan is driven by bevel gears with a friction disc joining the driving shaft with hub of fan spider. By this construction no belts or pulleys are used and the fan shaft is operated by gears directly driven from the half time gears on the motor.

"The ignition system consists of the Eisemann low-tension magneto, the current of which passes through an induction coil on the dash, giving a high-tension current at the spark plugs. In addition to the magneto system, and entirely separate, there is the same coil, commutator and battery system which has always been used on Peerless cars. The advantage of this double system of ignition is that either may be used independently; that is to say, the commutator, spark coil and battery may be entirely removed from the car, and there still remains a perfect magneto system of ignition; or, on the other hand, the magneto may be taken off and there is still the same well-known and thoroughly tested battery system which we have used for many years. All wires are connected with their terminals by spring attachment, so that there are no thumb nuts to release, and the wires may be instantly detached and the magneto entirely removed in less than one minute. By means of a solid rubber wire bar the method of wiring has been changed with respect to shortening the length of wires, which makes the whole ignition system simple, compact and of highly perfected appearance, and almost impossible to short circuit or to mistake the right connections at the spark plugs.

"The clutch is the internal expanding band type. It engages smoothly without shock, and being light and perfectly balanced, it stops rotating as soon as disengaged, so that the gears may be shifted noiselessly. Between the clutch and transmission is a shaft made of special alloy steel, the ends of which are forked and fitted into universal joints. These joints connect with the squared ends of the clutch and transmission shafts. The object of the universal joints is to take care of the twisting of the frame over very rough roads, and consequent loss of power as well as excessive wear. This forked end construction is capable of very easy adjustment, and the parts are easily removable.

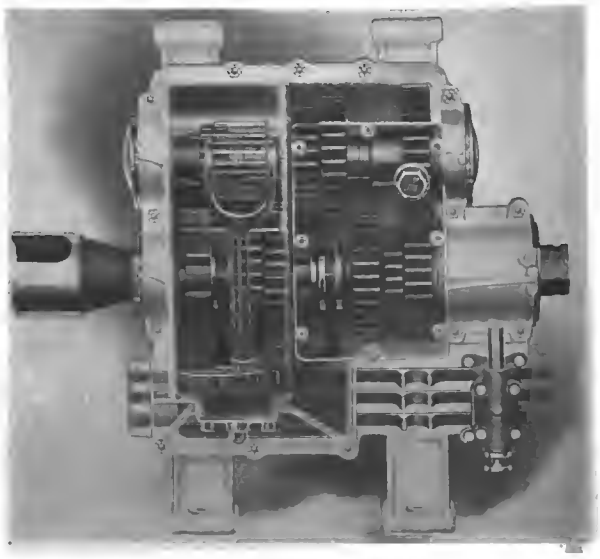
"The gear case is an aluminum casting made in two parts, the base containing the main shaft, driving gears and the countershaft with its pinions. The upper part of the speed case holds the mechanism for engaging the reverse gear. The gears and pinions are meshed by sliding gears of the selective type. The mechanism for meshing the reverse consists of a rack, rocker arm and sector with a cam. The feature of the change speed mechanism is the locking device which prevents the gears from sliding out of place, without changing the position of the change speed lever operated from the driver's side.

"The propeller shaft is fitted with universal joints at both ends, thus taking care of any relative movement.

"The type of universal joint on the propeller shaft of the 1909 cars has not been changed, but the joint has been improved in detail by adding ball bearings, and enlarging the joint for greater strength and wearing qualities.

"The universal joint pin of the new models now has a groove accurately ground and filled with balls, upon which an annular ball race turns. This ball race takes the place of the rollers on the older models, and its ease of turning and the assurance of being well oiled greatly improve the efficiency of the joint. The materials of the joints are of specially treated alloy steel, ground accurately to size. The joint is provided with a steel cover to house the rollers and hold sufficient grease to properly lubricate the joint.

"All the weight and load of the car is carried on heavy gauge steel axle tubes fitted into a cast-steel differential case, centrally located between the rear wheels. The power is transmitted by means of bevel gears, differential and live axle shafts operating clutch plates engaging with the wheel hub. On each side of the driving gears, and connecting with the live axle, are improved universal joint connections. This cardan or universal joint in the rear axle allows for the camber and dishing of the rear wheels, and is of a different type than those of previous years. By virtue of the greatly increased number of engaging points (14) over the previous year's construction (2), the uni-



Plan View of the Change Speed Gear Set.

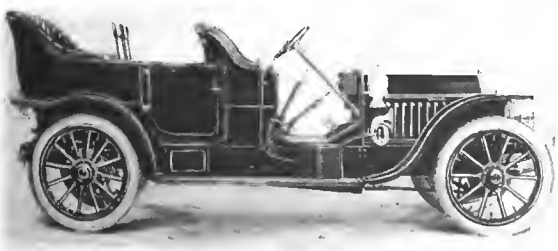
versal action is more uniform, the wearing qualities greatly improved, and from the fact that the driving or engaging faces are at a much greater distance from the center of the shaft than on the older types the construction is greatly increased in strength. They are made of imported alloy steel specially heat-treated to withstand rigorous usage.

"The front axle is a solid one-piece drop forging of I-beam section with spring saddles forged integral with the axle. The center of the front axle is the lowest point of the car. The pivot joint of the steering knuckle is supported on specially imported self-seating ball-bearings of large size. The steering mechanism is of the worm and gear type. The gear is a complete wheel, and being forged with the shaft assures the greatest possible strength, besides providing a greater wearing surface. Thrust bearings of special imported design are placed above and below the worm, and are spherical, self-seating. An 18-inch hand steering wheel is used on both new models. The steel rod connecting the steering knuckles is placed behind the front axle, where it is securely protected from any road obstruction or injury.

Details of Peerless Steering Mechanism.

"The frame is cold-rolled steel, of truss pattern, with sub-frame on which engine and transmission are carried. The drop frame adopted in 1906 is a feature of great importance, since the center of gravity of the car and load is nearer the ground, and yet does not interfere with the road clearance. The drop frame insures more comfort in riding, and the car may be handled more easily and safely at high speeds.

"Springs are made by Lemoine, of France, of the best grade silico-manganese steel procurable. Both front and rear springs are long and flat, and are highly polished lengthwise, which gives easy action, and in combination with the drop frame insures an easy riding car, adapted to rough country roads. Thirty-six-inch wheels, artillery type with dished spokes, are used both front and rear. The dished spoke construction best withstands any side strains, besides enabling the spokes and wheels to be made much lighter with more safety than wheels not dished. The body is the Peerless type, the rear seat being wide and the tonneau long and spacious. There is ample room for carrying five people comfortably in the tonneau. Seats have been designed of the folding type, which are practical and comfortable, and are very easily removed. A new patented door latch provides a simple and easy method of opening the door from the tonneau seat. The closed and touring bodies are interchangeable.



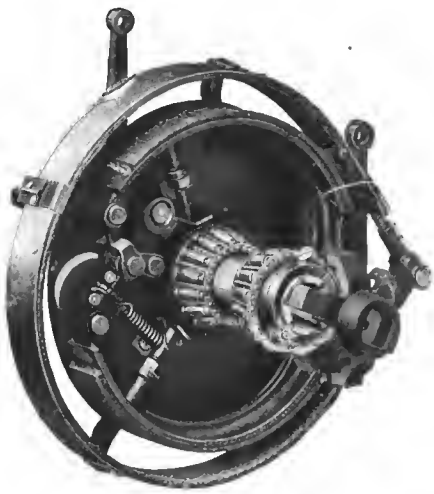
Four-cylinder, 30-horsepower Peerless Touring Car.

SOME NEW TIMKEN PRODUCTS FOR 1908.

Among the new products listed by the Timken Roller Bearing Axle Company, Canton, O., for the present season are a 1 5-8-inch I-beam forward axle, and their 6 B rear axle. The front axle is designed for cars weighing up to 3,400 pounds, ready for passengers, and embodies the latest developments in axle construction for pleasure cars. The center is a forging in one piece

Timken One-piece Drop-forged Front Axle Complete.

from open-hearth steel of a special grade, the spring saddles being forged integral, while the top flange of the axle is widened to give additional stiffness fore and aft. Timken roller-bearings, located in the top of the steering knuckle carry the load and render steering very easy, this being an important feature on high-powered cars where a heavy engine load is carried forward. The steering arms are put into knuckles with a taper shank of generous size, insuring safety at this critical point. Bosses are provided for making a good mechanical job of the attachment of the speedometer bracket. Only rear steering is provided, as with the latter the wheel centers can be brought much nearer the pivot center.



Rear Wheel Double Brake Assembly.

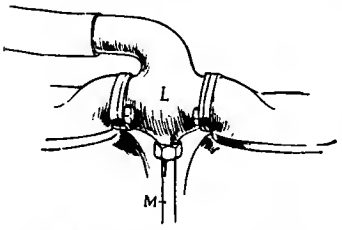
The Timken 6 B rear axle is designed for cars under 40-horsepower and weighing up to 2,800 pounds, ready for passengers, or when equipped with nickel-steel tubing and shafts, it is suitable for 60-horsepower cars up to 3,400 pounds, thus making it

Timken Rear Axle Driving Unit Complete with Brakes.

the companion of the front axle already described. It is made with either single or double brakes on drums integral with the inner flange, separate drums with an air space between, being employed with double brakes. The internal brake is completely housed and easy adjustment is provided on both. The axle tubing is 2 1-2 inches diameter by 1-4 inch wall, and is keyed and riveted into both the brake bracket and the center housing. This is a one-piece casting, carrying all of the bearings for the pinion shaft and differential, entirely independent of the driving shaft. Gear ratios of 2 1-2, 3, and 3 1-2 to 1 are optional, according to the weight and power of the car to which they are to be fitted. In the case of both the front and rear axle, the unit is entirely complete and ready to be placed upon the chassis for which it has been designed, bolting to the springs and connecting being all that is needed.

DOINGS OF BUSY INDIANAPOLIS FACTORIES

FOR many years prominent in flour-milling machine construction, possessed of a magnificent and beautifully situated plant and an inexhaustible fund of industry, the Nordyke & Marmon Company is exceptionally interesting to the student of modern motor car practice. The Marmon product stands in tbe same light to American practice that the Lanchester has occupied in European; that is to say, a car of exceptionally sound construction yet full of original ideas. There have been some radical changes in the Marmon for 1908, changes which experience showed to be justifiable under the march of conditions, but all of the principles which characterized the design of the first Marmon car still remain, although elevated to a higher plane of development. The new Marmon engine is an especially fine piece of work, and incorporates many features which the close observer would doubtless trace to a searching acquaintanceship with the highest grade of foreign practice. There are some excellent original ideas, however, incorporated in its construction, but these are mostly found in the details and not in any of the functional essentials.

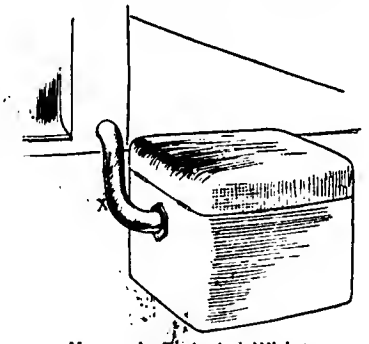


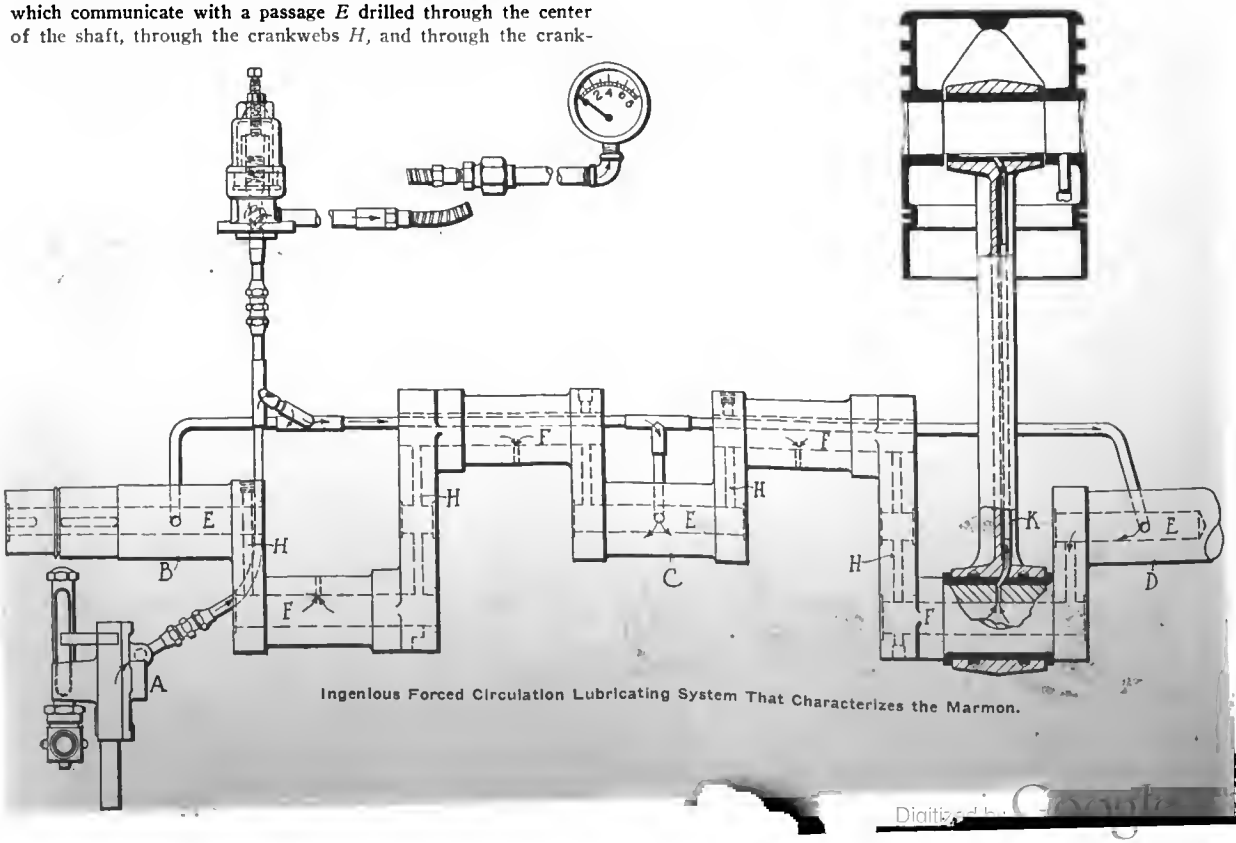
Water Coupling on the Marmon.

A Self-contained Oiling System.

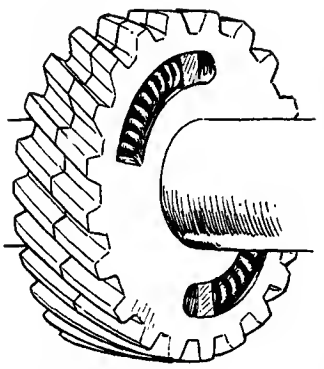
Probably the most interesting feature from a purely mechanical point of view is the system of forced lubrication, and although this is not uncommon abroad, it is used by few in this country. As shown in the diagram, it consists of a gear pump *A* taking oil from the base of the crankchamber forming a reservoir, forcing it thence to the crankshaft bearings *B*, *C* and *D*, which are grooved to receive the flow. Drilled so the grooves may supply oil to them are holes in the crankshaft journals which communicate with a passage *E* drilled through the center of the shaft, through the crankwebs *H*, and through the crankpins. Thus there is a complete oil passage through the crankshaft. The crankpins *H* are drilled to permit the egress of oil and the connecting rod bearings also are suitably grooved to distribute it. From these, however, an aluminum pipe *K* is run to the piston pin bearings, whence it can escape only by passage along the piston pin, thus insuring complete lubrication of tbis usually indifferently lubricated portion of the engine's anatomy. It is found that with the pump giving a pressure of approximately two pounds an ample flow of oil is kept to all parts, which flow of oil is proportional directly to the speed of the engine, and independent of the amount of oil in the system, provided, of course, there is sufficient to provide for the pump immersion. Another rather pretty construction is the way in which the upper water connection of the cooling system is made.

The Nordyke & Marmon company utilizes a double three-point suspension for the unit upon which is mounted the engine and transmission and for the running gear. The employment of this floating system makes it imperative that flexibility between the engine and the radiator shall be insured, so that a long rubber hose is utilized in place of the usual short section. The waterjacket covers carry opposed flanges between which a T-fitting *L* is located. This T-fitting also carries the union for the connection *M* to the carbureter waterjacket. Another interesting feature of this engine is the way in which the valve tappet lifters carrying the rollers which bear on the cams are located. The rocking lever is bracketed to


Marmon's Protected Wiring.



Ingenious Forced Circulation Lubricating System That Characterizes the Marmon.



Overland Spring Crankshaft Gear.

a circular flange, or cover, which registers in the crankcase. This and its adjacent fellow are held in place by a yoke and a central bolt which secures the two but renders them easily detachable. A feature of the Marmon valve system is the absence of a screw adjustment. The upper end of the valve tappet is drilled to receive a hard steel T-shaped tip, and any adjustment is made by adding or taking away shims below this tip. It may seem at first sight that this system is a little crude, but it certainly makes for simplicity, and one thing is sure, that after an adjustment has been made it certainly will remain fixed.

Novel Air Pump for the Fuel Pressure.

Another very interesting thing, and one which is novel in this country, is the use of a small air pump, cam-driven from the camshaft on the exhaust side of the engine, for maintaining the pressure on the gasoline. This pump has a bore of about 1 inch and a stroke derived from an eccentric cam of about 3-8-inch, with a spring return. The suction valve is mounted on the head of the piston, and the delivery valve, which consists of a small ball, held down to its seats by a spring located in the cylinder cover, which also carries a relief valve. The relief valve, of the ball check pattern, is larger than the pump check valve in order that the cylinder head containing both may be made a one-piece job. In order to secure this end the pump check valve is first dropped in and then its retaining spring got into place by means of coiling it more tightly in order to secure the reduction of diameter necessary to pass into place. Above this then comes the relief valve, which also has a superimposed coil spring adjustable to determine the maximum pressure on the gasoline. Another check valve is floated on the line between the pump and the gasoline tank, but this is done merely for the sake of precaution and to insure a perfectly tight connection at all times. The interesting point about this pump is the lack of noise, for any small air pump is apt to make considerably more sound than warranted.

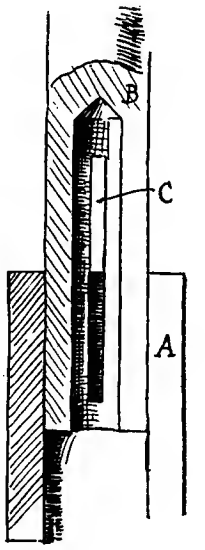
Marmon Double Three-point Suspension.

One of the principal constructional features of the Marmon car is its double three-point suspension. The engine and transmission are mounted upon a subframe pivoted to the main frame triangularly, the base of the triangle being forward and at the apex in the axis of the drive. This entails the inclination of the subframe carrying the engine and transmission rearwards in order to secure that desirable feature, a straight line drive, in conjunction with the equally desirable quality of ample clearance. The system of forced lubrication used entirely obviates trouble from this inclination.

A novel feature is the arrangement of the clutch and striking mechanism. In the first place a multiple-disc clutch with cork inserts is used. In the second place comprehension of the failings of the disc clutch has led to the adoption of an ingenious automatic clutch brake; and, thirdly, the clutch-striking mechanism is all safely ensconced in an extension of the gearbox away from the dust and dirt and always lubricated.

While talking of the National company's product mention was made of the fact that it has found the insertion of radial ball bearings in hard aluminum alloy cases without the use of intermediate cages perfectly satisfactory. In the Marmon machine a wide divergence from this practice is noticeable, for wherever a radial ball bearing is used a cast steel cage is employed to retain it. In the gear-set quite an original system is employed, the shafts with their bearings being supported in cast steel spiders which register in the gearcase, being securely bolted into place. The means of retention of these bearings is most ingenious. The cage is tapped for a 1-4-inch set screw, under the head of which a washer is located. This washer bears segmentally upon the outer race of the bearing, thus retaining it in place against end pressure. A number of these retainers are used about the periphery of the bearing race and the whole is securely locked by a wire threaded through holes in the heads of the set screws.

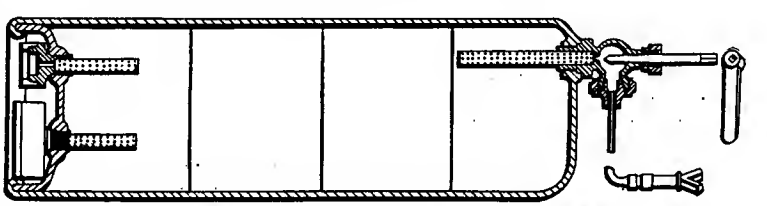
As with any car having this distinctive ingenuity of design, it is difficult to select just the points which are most interesting, exactly in the same way that it is difficult to describe with lucid reading interest a machine that differs in nothing from an accepted past standard. One cannot help, though, being impressed at the Marmon factory with the enormous amount of detail work through which the producers must have fought their way to their present status. There is no crudity found anywhere—the Marmon method is used all through, but perfection of purpose has certainly been reached. Look, for instance, at the way in which the battery leads are taken care of. The sketch shows the copper tube *X* encasing them, carrying them up to safety from weather conditions within the haven of the dash.



Speed Carbureter Jet.

Overland Cars Being Made in Tents.

To leave the Premier and Marmon factories and in a little while come to the Overland factory is to leave a staid eastern city and drop down in a real live western town. They are surely "going some" at the Overland plant. They are literally building machines in large tents grouped about the factory precincts and every available inch of ground space is crammed with men who are bing persuaded to do their utmost to bear their part in the production of the Overland success—for it has been a success, this little machine. Everybody at the Overland plant has the most irregular habits as regards eating and sleeping and quite regular ones as to work all the rest of the time; but through it all they carry a look of satisfaction that is unmistakable. On the dusty, bumpy road that runs past the factory doors test cars tear up and down just as hard as the men driving can send them. From a tent in the rear comes a continuous high-frequency rattle that tells of many engines on the test stands. In the factory proper no one has time to talk, for each and every one of them is a slave to success. The great rivalry of the plant is for the assemblers to beat the body builders, and it's a dead-heat race most of the time, for every available ounce of nerve pressure is being utilized by the entire working force to achieve that end.



Sectional View of a Prest-O-Lite Acetylene Gas Tank.

Overland Cars Being Built and Assembled Under Canvas.

It's a neat little machine, too—it looks well, behaves well, has snap, power, speed and is exceptionally quiet. The writer has rarely ridden in a quieter low-powered car, and this feature of the Overland is the more remarkable since the change speed gear is of the planetary order located at the rear axle. There are some things in the construction which are hardly conventional, but some are exceptionally effective. One is the arrangement of the forward engine gears. These are of the single helical type, and as such, except that it is rare practice to find them on a low-priced car, not remarkable. There is, however, a point of novelty that is distinctly worth while. The gear on the crankshaft has an extension to it which is free to turn on the shaft. By means of small springs tendency to relative motion is maintained between the gear proper and the extension, with the result that backlash in the gears working with the divided engine gear is entirely eliminated, irrespective of the amount of wear involved.

Presto-O-Lite Factory a Hustling Plant.

It is curious how the creation of an industry brings others in its wake. Few people have any idea of the magnitude of the American automobile industry *per se*, and still fewer of the extraordinary versatility of allied trades. For example, every autoist is conversant with the Prest-O-Lite tank and is thankful for the boon its invention conferred upon motors and mankind, but not a tithe of the interested public has any idea of the magnitude of the organization necessary to handle the manufacture and recharging of such an itinerant accessory. Prest-O-Lite tanks are, of course, charged at various central local stations all over the country, but the bulk of the manufacturing is done at the Indianapolis plant, although the drawn shells are from farther west.

The shell is filled with a porous absorbent body, partially saturated with pure acetone, a chemical closely allied to ether, which has the property of absorbing acetylene gas to an extraordinary degree, which absorption properties are increased by the gas being introduced to the acetone at high pressure. During the process of absorption the acetone almost doubles its volume and its weight increases.

The practical adaptation of these principles constitutes the Prest-O-Lite manufacturing process. The seamless steel shells are filled with an absorbent asbestos compound and the ends are brazed in. A known quantity of pure acetone is then introduced into the shell through the medium of the valve by means of a vacuum system. The tanks are then coupled to a pressure line carrying pure dry acetylene gas made from calcium carbide and water in huge generators and thoroughly scrubbed and dried. They are left on until heating of the tank from the internal absorption warns the operator that the first stage of filling is complete. The tanks are then permitted to cool, after which gas is again turned on, when, as a rule, the filling process completes itself without further attention.

To go closely into the process involved from a manufacturing standpoint would be exceedingly technical and, although interesting, somewhat out of place. To the lay mind by far the most engrossing of the mysteries of the Prest-O-Lite tank is the way in which its travels are tabulated. In the center of an annular table sits a young woman, and about her, placed radially, are card trays carrying ordinary card file size cards. These cards are serially and consecutively numbered and each card represents a tank—different sizes of tanks are accounted for by different colored cards. One side of each card is devoted to shipping instructions, with dates of shipment; the other to origin of consignment and dates, so that by taking a card out and glancing at either side consecutively one can tell exactly the tale of the journeying of that tank with reference to the home office. It's a marvel the way those tanks get around, almost like a fairy tale. A tank will start out from Indianapolis for New York and finish up in San Francisco months and months afterwards. The Prest-O-Lite company has its troubles, too. People manage to get the tanks full of water once in a while, although how it is done is a mystery to the firm. Then, notwithstanding instructions, they will insist on putting tanks on upside down, etc.

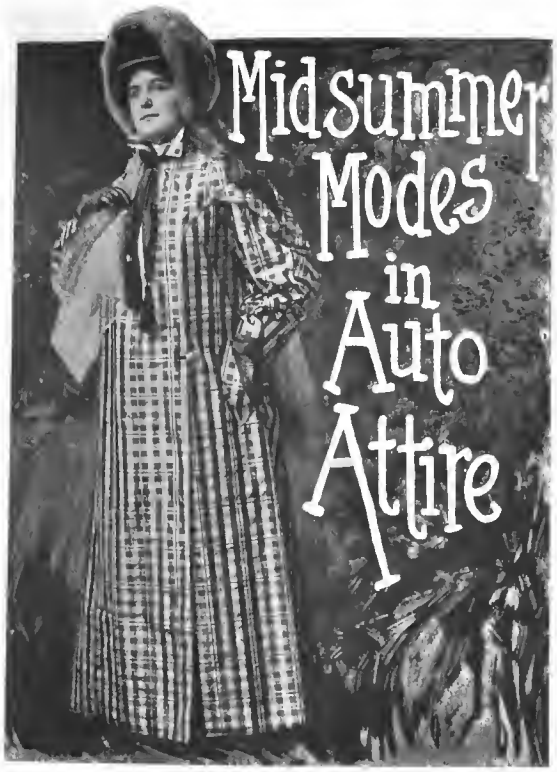
Air-cooled Motors, Carbureters and High-wheelers.

A concern that has been steadily working along in the automobile accessory business for a long time now is the Speed Changing Pulley Company. Apart from the manufacture of double-opposed and four-cylinder air and water-cooled engines upon entirely standard lines, it also is established in the carbureter branch of the industry. The carbureter this firm makes is now known as the Speed, but up to recently was termed the Universal; it has been on the market some time. To the mind of the writer, the jet device whereby the gasoline flow is regulated is one of the cleverest extant. It consists of a hollow stem having two very narrow saw cuts made in it. These cuts are meshed more or less as the gasoline supply is to be increased or cut down, as the case may be. This is particularly effective as an adjustment, as with it a change in the gasoline feed is quite gradual in its bearing upon the behavior of the carbureter. This firm, too, is experimenting at present with a high wheel buggy-type machine,

KEEP THE STEERING WHEELS PARALLEL.

Sometimes the front tire will wear abnormally, and the blame may be put upon the tire manufacturer, while it is really due to the wheels running out of parallel, and consequently there is rubbing on the ground as well as rolling, says *The Autocar*. With a car of good manufacture this may be thought an impossibility, but this is not the case if the car has been badly handled in daily use. One frequently sees a garage attendant move a car from one place to another, wrenching the front wheels round by means of the steering wheel with the car stationary. As the steeing gear enables one to put a great deal of power into turning the front wheels, the stress on the steering arms is very great, and consequently they are liable to be bent, and, in fact, do become bent out of shape, with much handling in this manner. Attention has also been called to the ill-effects from straining the gear with the hand wheel when stationary.

Midsummer Modes in Auto Attire



Novel-shapsd Coat of Clan Plaid Taffeta.

THE woman who fancies that almost any long coat, small hat and enveloping veil will answer for an automobile excursion makes a grievous mistake. Makeshift garb for such a purpose is quite liable to cause her to appear preposterously out of date. Moreover, out of regard for her hosts she should endeavor to be as smartly clad as is possible.

Midsummer automobiling is now so attractive a character that many women of unlimited bank account do not resist the temptation to purchase a number of outfits of distinctly different types. Some of these costumes are of a somber tone, others are almost frivolous looking, but all of them are decidedly smart.

In selecting an outfit for a tour of sevcral weeks' duration, such as many family parties take at this season of the year, it should be remembered that luggage space must be economized to the utmost. Consequently it is best to limit the number of long coats to one. This should be a rubberized rainproof garment of invisibly striped or plaided mohair, of some color that will not readily show the dust. For this purpose a medium shade of gray is excellent or the khaki brown that is now so fashionable and accords so well with a natural hued pongee traveling frock. These come in ulster shapes that are smooth-fitting across the shoulders, where the fulness is taken up with tailored darts. There is no unnecessary bulk about the hips, but the lower portion of the skirt slopes sufficiently to afford comfort when the wearer is seated and to prevent the garment from wrinkling at the knees. These coats have double-breasted fronts, fastening with moderately sized buttons, covered with satin matching the turn-back cuffs and turn-over collar. With such a coat may be worn a mohair-crowned and kid-visored cap, covered with a chiffon veil of a matching tint unless the fair automobilist possesses the moral courage to don a red veil, which better than one of any other color will protect her complexion from the sun.

For a short trip, during which there is a slight chance of being exposed to rough weather, there are coats of pearl gray, champagne or pure white crêpe de chine and twilled silk, which are exceedingly attractive. They are developed somewhat on *directoire* lines, in that they outline the figure without actually defining it and are short-waisted at the back. In front they close to below the knees with a single row of large fabric-covered buttons, so that when the wearer is seated in the car her frock is quite as adequately protected as if worn beneath a utility ulster. Of the same class are the stunning garments which are also used for carriage and country evening coats. These are of champagne-colored rough pongee, long, semi-fitting, double-breasted, closing with two rows of chased silver buttons resembling tiny inverted bowls. Their wide, turn-over collars and cuffs are broadly banded or piped with black satin and faced with corded silk of the genuine Hungarian cerise, which most nearly resembles that of the uncooked beet. The entire coat is lined with the same deep, vivid shade and there is a touch of it on the long black satin scarf which draws the collar together beneath the chin. With a garment of this character the hat must needs be of a distinctive character, like the pongee and Panama combinations or the natty little turbans of colored fine straw with crowns, bands or scarfs brightly striped, that are now so deservedly popular.

Another type of autoing coat which is popular for short midsummer trips is of checked and striped linen, which is neither dust or rainproof, but exceedingly light and cool, and possesses the merit of laundering in a satisfactory manner. These wraps are often the third piece of a linen costume comprising a jumper suit, a princess or a skirt and blouse of tobacco brown, dark blue or tan linen trimmed with contrasting shade or color. To accompany them are linen caps of the same hue, but rather more becoming headgear for both young and middle-aged women are the linen turban and toque shapes carrying short wings and quills.

There are certain accessories which every woman should take when starting on a trip of more than a day's duration. One of these is the rubberized and flannel-lined tweed or serge shoulder cape that is deep enough to reach to her hips and has a collar wide enough to protect her neck. Some of these capes have hoods which may be drawn over a moderately sized hat in case of a sudden rainstorm, but these are hardly so comfortable or so readily adjusted as are the separate hoods of silk-lined rubber, generously punctured with ventilation eyelets. Another accessory which should never be omitted is the hip-length sweater, with its high collar and long sleeves, which comes in several colors and is of the finest zephyr. Such garments have prevented many a thinly clad automobilist from contracting a severe cold. As they cling closely to the figure, even the woman who considers herself just a bit too plump for the prevailing long-lined classic effects need not fear that they will add

All Ready to Take the Wheel.

Auto Masks That Are Becoming.

too perceptibly to her apparent bulk.

Now that the sleeves of all daytime gowns are made so much longer and actually protect the forearms, long-wristed gloves, which formerly kept the draft from whisking up the wide wrist openings of her touring coat, are no longer necessary. The gloves designed for midsummer are of spun silk or lisle, with double finger tips and palms lined with kid. These are the most comfortable affairs imaginable and infinitely prettier on the hands than were those of heavy pelt that were so generally worn last year. Few, save the women who actually take the wheel, use gauntlets, and these are made similarly to those worn by men, save that the cuffs are sometimes stitched. If silk and lisle gloves are not comfortable, the next best choice is wash chamois. These are necessarily very loose fitting and therefore not so smart looking as are those of woven materials.

Women who constantly use the car find that in the long run it is better to wear high-topped shoes, as the ankles are apt to get chilled during a long ride. Moreover, such footgear looks more modest when the wearer must alight from a car within full view of the occupants of a hotel or clubhouse veranda. It is always best to have the shoes match the shade of the coat, and if this garment be of gray or tan the desired hue may be found in ooze calf, which is exceedingly flexible and therefore comfortable.

Although every automobile coat is supposed to have capacious pockets over the hips or at the side seams, a hand bag of moderate proportions is an additional convenience. The pigskin novelties of this description are perfectly equipped with all the smallest toilet conveniences arranged so compactly that in the remaining space may be put a China silk dressing jacket, an extra handkerchief or two, and a pair of stockings and slippers, not forgetting the dainty embroidery or lace-trimmed "nightie" of soft cotton that may be folded into small compass. It is the presence or lack of these numerous small accessories that make for comfort or the reverse when on tour, and only the woman who knows what it is to cover a hundred miles a day over an extremely dusty road can realize what it means to arrive at a hotel in the last extremity of dustiness, only to find that the process of rejunevation must be accomplished with the meager facilities afforded by the public hostelry. Despite the apparently adequate protection that the proper garments afford, the dust and dirt are all-pervading.

Two-toned Fashionable Costume.

Smart Clan Plaid Taffeta Coat.—Every woman who has the slightest claim to Scotch ancestry selects the plaid of her particular clan when buying a taffeta automobile coat of that type. Because the patterns are of themselves effective, the garments are developed on the simplest of lines. Some of them have absolutely plain fronts, which fasten at the left side just below the waist line and again near the shoulder by lapping over the top of the draped sleeve, which gives the sloping shoulder effect to the garment. The vogue of satin trimmings shows in the tassel-ended necktie, and the diamond-shaped epaulets and the cuff insets.

Ready to Take the Wheel.—Women who are expert drivers of automobiles contrive to get themselves up most effectively for their diversion, although it is necessary to wear a coat sufficiently roomy about the shoulders and arms to allow the body perfect freedom. As a veil is liable to blow across the face and impede the view, it is for the nonce discarded in favor of a semi-hood, which protects the hair and ears from dust. This is of the same material as the rubberized white coat and is attached to the under side of the hat brim. The silk covered rough straw hat should be so close fitting that the wind will not disturb it. It is trimmed with dark wings and fancy braid to match the kid gauntlets.

Masks.—To protect the complexion from freckles, sunburn and tan and at the same time to obtain an uninterrupted view of the scenery is a problem only to be solved by the motoring mask. This is built upon a slender wire frame, shaped to fit over the nose and beneath the chin, and is composed of isinglass veiled with a ten-inch ruffle of white point lace. Such masks may be adjusted to hats of any shape and are put on before the veil or hood is arranged. As they leave only the eyes exposed they are quite as becoming as the face veils worn by the women of the Far East.

Two-toned Costumes.—Among the most attractive of the widely checked rubberized taffeta motoring coats are the ulsters in two tones of blue, brown or green, having double-breasted fronts, closing with medium-sized buttons, patch pockets similarly decorated and cuffs and collar of the darkest hue. The two-tone scheme of coloring is carried out in the hat and veil, the straw turban being of the darker shade and trimmed with a soft silk scarf of matching hue, and the veil of the pale tinted chiffon embroidered with dark polka dots and finished with a scalloped edge.

THROUGH BOSTON-NORTH SHORE ROUTE OPEN.

Boston, July 13.—An important concession to automobilists has been made by the Metropolitan Park Commission in the opening to motor vehicles of the Revere Beach driveway on every day during the summer except the afternoons and evenings of Saturdays, Sundays and holidays. This driveway is a short stretch of road connecting the Revere Beach parkway, the main route from Boston to the North Shore and beyond, with the extension of the parkway and the State road leading into Lynn. Heretofore automobilists were permitted to use the driveway in the summer time only after 11 o'clock at night and before 11 o'clock in the morning. With the opening of the driveway at all times except Saturday, Sunday and holiday afternoons and evenings, a complete park route from Boston to the North Shore is available. Previously motor vehicles have had to use a narrow town street crowded with street cars and beach visitors in the rear of the driveway, and it was far from being a pleasant route over which to drive a car at any time of the day.

Aeronauts Enjoy Summer's Sunny Skies

The French War Balloon "Republique" Ready for Flight at Moisson.

PARIS, July 9.—*Republique*, the dirigible automobile balloon of which France is so justly proud, has been launched. At 3 o'clock of a calm June morning there was bustle and activity around the big Lebaudy shed on the plains of Moisson, 30 miles to the northwest of Paris. At 4 A. M. the successor of the unfortunate *Patrie* majestically came forth into the open air and at five o'clock George Juchmes mounted on board and gave the order for the big Panhard engine to be cranked. Three minutes later the *Republique* was heading off to the west on its first trip in its natural element.

It was a mere formal preliminary flight that was attempted, the pilot and his crew of three being satisfied after the airship had evolved in all directions for a period of 34 minutes. For the next six days trips will be made every morning, weather conditions being favorable, the military crew will be trained, and at the end of that time the army commission will be invited to attend the official trial trips, during one of which the automobile balloon will be called upon to travel at full speed for two hours. A brief stay at Chalons-Meudon will follow, pending the construction of the special dock at the eastern frontier town to which the fighting unit will be attached. Some authorities declare that Toul will receive the *Republique;* there are others of the opinion that the registered port will be Belfort. It is certain, in any case, that the Germans will have the war balloon as a near neighbor.

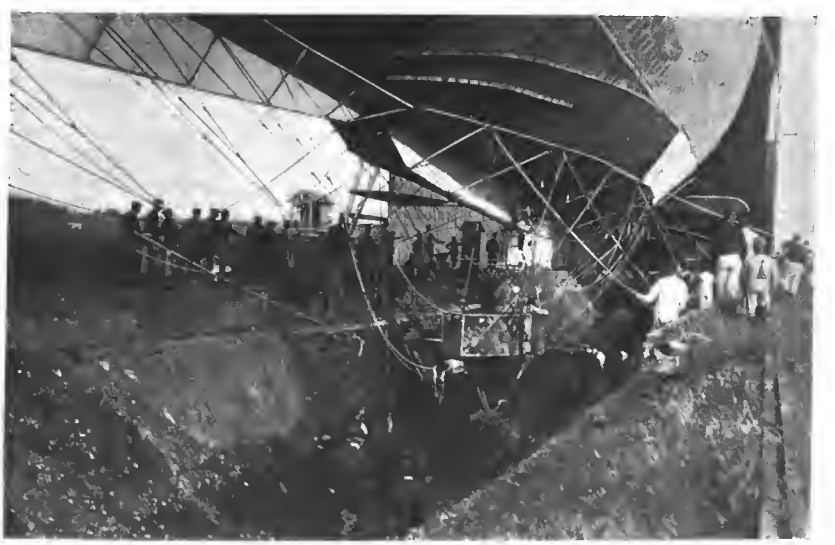
So far as the balloon portion is concerned, George Juchmes has built the *Republique* on practically the same lines as the military dirigible *Patrie* which escaped and was never found. Overall length is 200 feet; greatest diameter is 34 feet; total cubic measurements are 130,000 feet. When filled wtih pure hydrogen gas, the lifting capacity of the balloon is 2,513 pounds. Maximum speed is 31 miles an hour, and the time the balloon can remain aloft at a normal speed without renewal of its gasoline supply is eleven hours.

The power plant of the *Republique* is a 70-horsepower four-cylinder Panhard motor carried in the center of the cage and operating a couple of two-bladed propellers at each side of the airship. A clutch is interposed between the motor and the propeller shaft and a gear-box is provided. The motor has high tension magneto ignition with storage batteries as a stand-by, the gears this time being completely enclosed. As will be remembered it was primarily owing to a mechanic's jacket engaging in the open gears and stripping them that the *Patrie* was lost. The cooling arrangements are identical with those of Panhard touring cars, the familiar type of radiator being carried on the port side of the cage, just behind the propeller.

Extra precautions have had to be taken with the exhaust, for any carelessness in this respect might lead to the entire destruction of the balloon. The manifold is carried out on the port side right opposite the propeller, and is led into a triple muffler, each one having a specially designed radiating surface. The discharge into the air takes place fully astern and under the cage. All gasoline is carried in a large tank with pointed ends suspended to the underside of the cage, the liquid naturally being under pressure. Should any leak take place the fuel would be carried clear away from the cage, thus reducing fire risks to the minimum.

The internal compensating balloonet, the object of which is to overcome the inequalities caused through distention or loss of gas, is normally filled with a pump driven off the motor. As a provision against any possible breakdown of the machinery it can, however, be operated by means of a hand wheel.

An improved feature of the *Republique* is the use of lateral wings by means of which it is possible to raise and lower the balloon in a very large degree without the loss of ballast. An example of this was given on the first trial trip, the airship leaving ground, evolving for half an hour at a height of over 100 yards and coming back to its shed without throwing out an ounce of sand, or having its gas valves disturbed.



"Republique" Returning to Its Shed After Successful Flight.

As soon as the *Republique* has gone through its official tests and been handed over to the military authorities George Juchmes, its designer, will busy himself with the improvement of the *Lebaudy*, one of his earliest dirigibles, and later will commence the construction of the *Liberté*, sister ship of the *Republique*.

The material employed in the construction of the gas bag of the *Republique* is rubbered cotton supplied by the Continental Caoutchouc Company from their German factory. The various sections are fastened together by a sewing machine, the seams being covered by bands of rubber cloth. The interior ballonnet is constructed in the same way, and is provided with four automatic air valves releasing the air when a certain pressure is attained so that the regulation of the extremely important essential of the airship is taken care of without the operator's attention.

DELAGRANGE MAKES RECORD WHICH FARMAN ECLIPSES

MILAN, July 9.—Leon Delagrange still holds the world's flying record, his latest performance having carried him far beyond any of his rivals having made public flights in Europe. At seven o'clock of the evening of June 22, in the presence of a large number of spectators and under the control of an official delegation, the Parisian sculptor started up his Voisin flying-machine, rose into the air without any hesitation, and remained aloft 16 minutes 30 seconds, thus beating his own record of 15 minutes 20 seconds made at Rome.

In connection with the flight it is worth noticing that the flying machine is in absolutely the same condition as when it left the Voisin Brothers' shops. The motor is the same 50-horsepower eight-cylinder Antoinette, unchanged except for a larger capacity water tank. This record performance of Delagrange bears out the declarations of Levavasseur, the builder of the Antoinette engine, that the aeroplanes could remain aloft indefinitely in a calm weather, the length of the flights being entirely limited by the ability of the pilots. When, a few months ago, a three-minute flight was a remarkable performance, Levavasseur maintained that the only obstacle to a flight of as many hours lay in the pilots themselves. "It is not because of lack of water or the using up of the gasoline supply that Farman and Delagrange cannot make longer flights, but entirely because they are not sufficiently trained to remain aloft longer. Flying is an entirely new experience, and at the end of a few minutes the men become afraid."

Levavasseur's theory has been proven correct, for Farman has progressed from six yards to as many miles with the original type of machine and Delagrange has lengthened his flights from one minute to 16 merely by personal training. It is absolutely certain that the prize for a flight of 30 minutes will be captured by either Farman or Delagrange before the summer is far advanced.

It is estimated that the distance covered by Delagrange in his record spin through the air was eleven miles. This, however, is only approximate and is on the supposition that the machine was traveling at the rate of 50 kilometers an hour. As can be readily understood it is a somewhat difficult matter to accurately register the distance covered by a flying machine, especially when the course is a circular one, as was the case with Delagrange, it being out of the question to follow it.

It had been hoped that a flying match would be disputed at Milan between Delagrange and Farman. It has been impossible, however, to arrange conditions and after a couple of days here Farman has left for Paris. Delagrange remains until Wednesday, when he will leave for Turin, in which town he has engaged to make public performances.

According to one authority the public performances of Delagrange in Italy will have netted him a profit of not less than $60,000. In France practically nothing had been gained, for Delagrange just missed the few big prizes offered and never obtained a cent from public demonstrations. It is also declared by the same authority that Delagrange has under consideration a trip to the United States for demonstration purposes, believing that if a tour were organized in the Eastern States it would be a complete financial success.

According to cable advices, Henry Farman has eclipsed Leon Delagrange's record of remaining aloft of 16 minutes and 30 seconds, made June 22, at Milan, Italy. At Paris, July 6, Farman succeeded in remaining with his aeroplane in the air for 20 minutes and 20 seconds, covering a distance of 18 kilometers, thereby winning the prize of $2,000 offered by M. Armengard.

M. Bleriot made an attempt the same day to win the same prize with his monoplane, but succeeded in remaining in the air only 10 minutes and 23 seconds.

FARMAN TO MAKE FLIGHTS IN AMERICA?

Announcement was made in New York papers last Saturday that Henry Farman, the noted French aviator, who has been conducting experiments in France, had signed a contract with a syndicate headed by Samuel Bowman, a real estate operator in St. Louis, to give a series of fifteen exhibitions in this country this summer for $24,600, or approximately $1,600 for each flight that he engages to undertake.

The shows are to be given in enclosures. An admission fee is to be charged, although the press agent avers that the syndicate, which has guaranteed the money to Farman, is entirely altruistic and is "in it" for science and not for profit. The members of the syndicate, however, hail from St. Louis, Mo., that State in which, it is said, everything has to be made manifest, and someone will have to be "shown."

That there is "money in flying shows" is indicated by the fact that a little dissension is apparent already between the promoters of them. The St. Louis syndicate had hoped to sign that other noted European flyer, Delagrange, and to have contests between him and Farman. The first exhibition is to be held at Brighton Beach during the present month, though the French aviator has been having trouble in shipping his apparatus to this country.

BOSTON AERONAUTS TO BUY BALLOON.

BOSTON, July 13.—The New England Aero Club is no longer to be a balloonless organization, as the members, at a meeting, have voted to purchase a balloon. The sum of $615 has been subscribed toward the purchase and it is expected that the balance will soon be in hand. The committee is considering the purchase of the balloon "Boston." It will be located for the present at North Adams or Pittsfield, but later on it is hoped to have a balloon park at Lowell, Worcester or Fitchburg. The club voted to subscribe to the agreement of the Aero Club of America concerning the requirements of a pilot. So far the only qualified pilot of the New England club is Charles J. Glidden, who has made ten ascensions in this country and abroad. Other members who have made ascensions are Professor A. Lawrence Rotch and H. Helm Clayton.

At the meeting Professor Rotch, the president, showed a set of instruments he had devised for finding latitude and longitude while in a balloon. The instruments include a sextant corrected for the horizon and a self-recording barometer giving the height. Mr. Glidden exhibited his ballooning outfit, which weighs 22 pounds, all packed in a case, thus making it extremely convenient to carry around as baggage when traveling.

BAD TURNS MAKE ARROWHEAD TIMES SLOW

NEW YORK, July 13.—As the venue for a hill-climbing course, Depot Lane, which is a twisting thoroughfare connecting the uplands of Washington Heights with the site of Fort Washington on the river, and incidentally with a railroad depot, from which it derives its title, proved not to be all that could be desired by any means. It is only three furlongs, or at least that is all the hill that it can boast, and quick times might well have been expected over such a short distance had not the very bad kink in its upper half, for which the Lane has always been noted, compelled the drivers to practically come to a stop, while the remainder of the course was not sufficient to permit of gathering speed a second time. The event was the first annual hillclimb of the Riverside Motor Club and furnished considerable entertainment for a large crowd in spite of the comparatively slow times.

Bourgue in Knox Setting Record Mark for the Hill.

The Knox cars gathered in several of the principal honors of the day. Dennison, in the free-for-all class, covering the course in :23 2-5—the day's record for time. The next best time was also made by a Knox, driven by W. Bourgue, in :23 4-5. He also won in three other classes, with a shade more of time against him, but giving creditable performances nevertheless.

Frank E. Dunnell's Ford won two other events, while single victories went respectively to H. E. Wagner's Babcock, Tommy Forbes' Overland, and M. Klar's Kelton, all in the taxicab class.

The taxicab contest was the closest event of the day, putting the official stop watch to a severe test, and Kelton got the decision on a fifth of a second's margin to the good, furnishing momentary excitement for the assemblage along the course.

Swan with his Stearns who finished second in the class for cars listed at $4,000 and over, protested the Knox, winner, on the ground that the latter car was catalogued lower than $4,000 and in consequence not eligible to compete in the event in the class with the Stearns. This protest was noted and will be acted upon later, no announcement being made until then.

The American, with Stewart Elliott at the wheel, nearly mixed matters in one event, when the steering gear jammed just as he was about to take the turn. The car headed for a stone fence, but fortunately struck a point where the fence opened into a field, where it was brought under control. Aside from this there were no accidents owing to the extreme caution exercised by the drivers in taking the curve, which is without a doubt by far the worst that any of the most seasoned drivers in hill-climbing contests have had to snake a car around in all their experience, and that is saying a great deal.

Below are the results of the various events.

GASOLINE CARS, $850 OR LESS.

1.	Ford	15	Frank Dunnell	:32 2-5
2.	Maxwell	12-14	W. B. Ladd	1:01 2-5
3.	Gyroscope	18	A. Comancho	1:14 2-5

ELECTRIC VEHICLES, ANY PRICE.

1.	Babcock Electric	—	H. E. Wagner	:41 2-5
2.	Babcock Electric	—	Dr. A. C. McIntosh	:44

GASOLINE CARS, $851 TO $1,250.

1.	Ford	15	Frank Dunnell	:30 2-5
2.	Overland	22	Tommy Forbes	:38 3-5

GASOLINE CARS, $1,251 TO $2,000.

1.	Overland	22	Tommy Forbes	:45
2.	P. & S. Skimabout	30	G. T. Manville	:49 4-5

GASOLINE CARS, $2,001 TO $3,000.

1.	Knox	30-36	William Bourgue	:24 4-5
2.	P. & S. Six-Sixty	60	F. L. Lescault	:26 3-5
3.	Ford	40	Frank Dunnell	:30 3-5

GASOLINE CARS, $3,001 TO $4,000.

1.	Knox	30-36	William Bourgue	:24 4-5
2.	American	50	Stewart Elliott	:25

GASOLINE CARS, $4,000 AND OVER.

1.	Knox	30-36	William Bourgue	:24 3-5
2.	Stearns	30	K. Swan	:25 2-5
3.	Lozier	45	Harry Michener	:25 3-5
4.	American	50	Stewart Elliott	:25 3-5

FREE-FOR-ALL, ALL MAKES AND POWER.

1.	Knox	48	A. Dennison	:23 2-5
2.	Knox	30-36	William Bourgue	:23 3-5
3.	American	50	Stewart Elliott	:25 4-5

TAXICABS TO CARRY FOUR PERSONS.

1.	Kelton	30	M. Klar	:35 3-5
2.	Knox	25-30	A. Dennison	:35 4-5
3.	Garford	30	S. H. Elliott	:36 2-5
4.	Bianchi	22	Felix Prossem	:39 4-5
5.	Franklin	18	Charles F. Fox	:41 4-5

At the Foot of Arrowhead Hill When the Cars Were Lined Up Awaiting Their Turns at the Trials.

THE AUTOMOBILE

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LAUNCHING THE GOOD ROADS CAMPAIGN.

Being the first concerted movement of its kind, much was naturally expected of the initial Legislative and Good Roads Convention of the American Automobile Association which held the boards at Buffalo last week, but not even the most optimistic advocates of uniform and reasonable legislation and improved highways would have cared to commit himself to the extent of predicting more than a fraction of the actual results that have been achieved. Some idea of the widespread interest manifested in the event may be gained when it is stated that not only were the State engineers and other highway authorities from many States of the Union present, but the Federal Government was also represented, thus revealing in an unmistakable manner that the nation as a whole is actually awakening to the importance of improving its vast network of highways.

Had it done nothing more than to call general attention to the fact that legislation in this country on the subject of the automobile is utterly without rhyme or reason, where the majority of the States is concerned, and that a man may constitute himself a criminal merely by attempting to pass from one to another in a power-driven vehicle, the legislative branch of the convention would have justified its existence. But it did a great deal more, and it is quite safe to say that the result of the efforts of the various authorities who gathered to discuss the legal aspect of automobiling will form an entering wedge, the effect of which will be plainly apparent within the next year or two. Contradictory and unreasonable legislation, passed in a spirit of medievalism, is as much out of place in the twentieth century as are the miles and miles of meandering and holey cowpaths, which, through lack of some equally brief and comprehensive term, we are compelled to call roads. Both "retard the progress and development of the automobile and greatly lessen its usefulness," to quote Chairman Terry, and, it may be added, one is as necessary as the other.

Apart entirely from the vast amount of good work that was directly accomplished in the limited time available, on both the subjects for which the convention assembled, its indirect influence in awakening public opinion to the true state of affairs is incalculable. Once the man in the street comes to a realization of the fact that, though he may never be the possessor of one, the development of the automobile and its most important mission, the improvement of the highway, affect him, opposition will melt away as if by magic and results, once so difficult of attainment, will follow naturally from the inertia of the vast force thus set in motion.

* * *

FRENCH RACING PLANS MISCARRY.

It is now in order for the French automobile industry, which controls racing in that country, to institute a new annual classic—one in which French chances will not be 40 or 50 to 1, but 100 to 1. France must be a winner every time. The Grand Prix gave promise of this and the first year results appeared to justify the killing of the Gordon Bennett, but in 1907 a mere tyro at automobile building, Italy, scooped all the honors. That was bad enough in all conscience, but this year, *Helas! C'est a pleurer a chaudes larmes,* the Teutons, the very last people on earth by whom the Frenchman cares to be beaten, took everything there was to be had, and as handily as you please. It is indeed a bitter pill for French pride to swallow that none of her crack drivers of many years' experience was able to cross the line better than fourth.

Galling enough to be beaten by one's dearest enemy under any circumstances, but to be so utterly overwhelmed that there is scarcely a straw of consolation to be grasped anywhere, certainly *"it is to weep the hot tears."* Nothing remains for France but the glory of bygone victories and the necessity for framing up something new. Exactly what form this may take, it is hard to predict, but certainly an excuse exists for changing.

A A A Conventioners and Good Roads Advocates Finish their Work at Buffalo

Delegates Arriving in Front of Headquarters at the Hotel Iroquois.

BUFFALO, July 9.—The second day of the Good Roads and Legislative convention of the American Automobile Association was intensely interesting and marked an epoch in the general progress of automobiling. Owing to the necessitated absence of Chairman Robert P. Hooper, of the A. A. A. Good Roads Board, ex-Governor N. J. Bachelder, Master of the National Grange, took the chair, and carried out to the letter the program prepared by the general committee in charge.

The committee on resolutions was given a hearing and the resolutions presented by Charles T. Terry, chairman, were unanimously adopted. In brief they pledge the National Grange, the American Roadmakers' Association, and the American Automobile Association to work for the election of legislators, national and State, who will support the uniform state motor vehicle law proposed by the A. A. A. and the enactment of the Federal automobile registration law. Governor Bachelder in the opening address raised the points of difference between automobilists and farmers, giving his opinion that obstructive legislation operating against automobile owners has been justifiable to an extent, owing to the coming of the "speed maniac" and his life-endangering use of the highways where the horse is still the prime motive power.

Referring to the alleged road destroying effects of the automobile, he suggested that the facts relating to the effects of automobile traffic on improved roads should be ascertained before raising needless alarm over the alleged destructive tendencies of the inflated rubber tire.

Governor Bachelder then proved by statistics, figures and argument the contention that the motor-driven vehicles would prove an economical transport for the farmer.

In advocating Federal appropriations, the Governor called attention to an unfair division of tax expenditures—the farmers, one of the country's most productive tax-paying classes, not receiving their just share in the expenditure. He said:

"The farmers are determined that this state of affairs shall not continue. They have made up their minds that Congrese must devote a share of the annual appropriations to the construction and maintenance of our roads. Some of ue believe that the creation of a National Highway Commission, with power to organize an efficient corps of trained road engineers, who, in cooperation with the State and local highway authorities, would supervise the disbursement of the Federal granta, would be a highly satisfactory solution of the important good roads problem."

In conclusion he said that Federal aid in road improvement will not lessen the interest of states, counties, and townsbips in this matter. To the contrary, it will have a stimulative effect.

"New York's Highway Code" was the subject discussed by Senator Jotham P. Allds, of New York. He outlined the system of road maintenance, telling of the subdivision of the great work. The Highway Commission consists of three members: a civil engineer and representatives of two political parties—one in power, the other second highest in number of votes cast. For the technical work of general supervision and formulation of plans the State is divided in this division under division engineers who constitute the right arm of the commission in dealing with the work both of construction and repair of the State and county highways. Ample clerical and engineering forces are provided for this general work, and underneath the division engineer is either a county superintendent in case the Board of Supervisors see fit to appoint one or a district superintendent who shall have charge of more than 5,000 linear miles of highway—the district to be erected and the superintendent to be appointed by State Highway Commission. He concluded by saying that upon the adoption of the statute, after it has been strengthened by the recommendation of the commission, citizens of New York will be well assured that they have a piece of constructive legislation covering the entire subject of highways which will be at least the equal of any highway statute in the United States, and under which the $50,000.-

Secretary Elliott Welcomes Pittsburg Delegation, Headed by Secretary Paul C. Wolff, of the Pennsylvania Motor Federation.

Group of A. A. A. Officials Stand for the Camera.

000 granted by the State and the $35,000,000 contributed by the towns and the counties will be honestly, economically and wisely expended; and that by education and due supervision a great advance will be made in the repair and maintenance of roads.

The discussion of "The Improvement of Town Roads" was taken up by Stephen Ryan, State Road Director of New York State Roads. The speaker deplored the lack of a perfect understanding between automobilists and town officials. He said:

If I stood here for the purpose of addressing a body of automobilists, and them only, I think I would try to convince them that their greatest difficulty is that they do not understand the country people and the difficulties they have to overcome in good road building; and I would also try to convince them that they have got to look to these people for the solution of this problem.

If I stood here to talk to a body of town officers and Grangers, and to them only, I think I would try to convince them that their greatest difficulty is that they do not understand the motives of the automobilists and the good that they have done in creating an interest in this work and in getting the money for improvements.

He then described the financial stringency existing in some towns, quoting instances where good road making was badly handicapped by appropriations that ran as low as $100 a mile. Per contra, the town of East Chester, in Westchester County, New York, has $1,138 a mile with which to work its roads.

Perhaps the most encouraging sign of the times is shown in Mr. Ryan's statement that, in 1899, the first year under the money system, $173,000 was spent in the money system towns for highway purposes. Five years later this had increased to $1,291,000. Last year, including bridges and extraordinary repairs, $3,812,000 was spent and we estimate that next year with all the towns under the money system $6,135,000 will be spent on highways and bridges on town roads.

"The Call for Good Roads and the Propriety and Need for Federal Aid," was handled in a thorough manner by F. A. Derthick, Master of the Ohio State Grange. Mr. Derthick, speaking along lines similar to those of Governor Bachelder, said:

An Enthusiastic Good Roads Advocate in His Apperson.

I look forward to the time when the auto will be of practical service in the country, not only in the transportation of our crops from farms remote from shipping points, but in the transportation of our children to the centralized schools of the future, thus obviating the enforced irksome ride of some hours each day over dirt roads that at times are bottomless. The nation has given aid to railways, which has resulted in developing rich sections of our country and placed the United States in the forefront as a commercial nation. This policy was criticised at the time, but whether right or wrong the policy now seems wise, from a business point of view, as it has added billions of dollars to our national wealth. As a tax asset government aid to railroads proved a good investment, for to say nothing of the vast increase in value of real estate, and consequent swelling of the duplicates of the various States traversed by these assisted railroads, the roads themselves have been no mean contributors in meeting public expenses.

The Motor Parkway, Long Island's new special highway for automobiles only, was well described by A. R. Pardington, general manager of the Parkway. His talk concerning this "Auto Utopian" project was immensely enjoyed by his hearers, especially those representing the automobiling side of the assembly.

D. Ward King of the Missouri State Board of Agriculture told his hearers about the treatment of earth roads, during which the split log idea was brought forward and thoroughly explained.

A. W. Campbell, Deputy Minister of Public Works of the Province of Ontario, spoke interestingly on the new road era in Ontario and told of the good work which has been done there in the past and what is proposed in the future.

Of special interest to the grange and farmers generally was the address of F. N. Godfrey, master of the New York State Grange, who spoke on "Good Roads and Automobiling from the Farmer's Standpoint" and who impressed the need of a give-and-take policy and mutual cooperation on each side.

"The Highways of Massachusetts" were discussed by Harold Parker, chairman of the Massachusetts Highway Commission, and James W. Abbott of Nevada, late U. S. Highway Commissioner for the Rocky Mountain and Pacific Coast States, told of the "Road Problems of the Pacific Coast."

The delegates found the press of business on Wednesday morning so great that it was long after the set hour for final adjournment that the hall was cleared. The last hour of the convention was a crush, but President Hotchkiss managed to push through several important matters calculated to forward the Good Roads movement.

Resolutions were readily passed, calling for a convention of the A. A. A. every year, and the following committee on arrangement was appointed to handle the convention in 1909: Robert P. Hooper of Philadelphia, chairman of the Good Roads Board of the A. A. A.: N. J. Bachelder of Concord, N. H., master of the National Grange; J. H. McDonald of Hartford, Conn., president of the American Roadmakers' Association; Charles T. Terry of New York, chairman of the A. A. A. legislative board; S. D. Waldon of Detroit, representing the National Association of Automobile Manufacturers; W. H. Hotchkiss, president of the A. A. A.; and F. H. Elliott, secretary.

The A. A. A., the National Grange and the Roadmakers' Association by resolution have pledged themselves to work for a Federal automobile law, as well as for favorable good roads legislation in Congress, and a committee of 24 appointed to see that the resolutions won't go the way of the New Year's resolve.

The Currier law, now pending in Congress, was unanimously endorsed and the three associations joined in one resolution condemning harmful use of highways by autoists and other users.

Cincinnati wants the next convention and is putting up a strong fight to gain its point. However, no decision on this point was reached and the question was tabled. A committee of nine was appointed to pass on the claims of rival cities. The convention then adjourned sine die.

Good Roads Demonstration a Great Success.

BUFFALO, July 9.—The practical demonstrations of road making and dust suppression were viewed yesterday by the delegates and visitors of the convention. The committee on arrangements was a bit skeptical as to its ability to line up the required

300 cars, but the automobilists of the city rose gallantly to the occasion and the last machine leaving the Iroquois at two o'clock carried but three passengers—one less than its capacity. The line of cars strung out over 25 miles.

Perhaps the most interesting feature of the trip was the exhibition of state road making near Clarence. Here a road was tested in all its stages from a rough country road to macadam boulevard, newly constructed and smooth as a table, was viewed and felt. A section of road is being built here with state aid. The occupants of the cars saw the stonecrusher in operation, gangs of men and teams at work plowing, grading, hauling material and big rollers pounding the macadam into solid road.

Banquet Brings A. A. A. Convention to a Close.

Notwithstanding that the A. A. A. reliability tourists left this morning, the banquet held at the Iroquois Hotel last night was a pronounced success from the attendance standpoint. More than 150 representatives of the A. A. A., the National Grange, and the American Road Makers' Association sat down to a feast that was good to the palate, but more appetizing to the intellect.

Timothy Woodruff, of New York, the first speaker, said he wasn't used to being an accelerator in anything except political gatherings. "Good Roads," he said, "is the most important problem before the American people to-day, despite the fact that some men believe that the merchant marine is of more vital importance. If you cannot travel at sea under an American flag, you can at least travel under a foreign flag, but the highways of the United States are in such condition that you cannot travel them under any flag. The roads of France are two decades ahead of us. It isn't our fault. It's the fault of environment. Europe has grown through her highways. America has grown through her railroads. We've outstripped Europe in everything we've gone in for. We can outstrip her in time in the matter of highways."

Ex-Governor N. J. Bachelder, of New Hampshire, when called upon, said that the National Grange had been working for good roads for several years and, he added, "It's going to keep on working." Governor Bachelder was introduced as the man who controlled 1,000,000 votes for good roads and good roads legislation.

Mayor Adam, a two-weeks-old automobilist, said that he was a lifelong member of the A. A. A., "from now on," he added with an Irish bull, creating gales of laughter.

James H. MacDonald, the popular highway commissioner from Connecticut, president of the National Road Builders' Association, made the wittiest speech of the evening, in which he mingled sound advice with canny Scotch stories.

Senator Allds, who got one of the heartiest receptions of the evening, spoke from the standpoint of the farmer, saying the latter had just awakened to what good roads meant to them. "We recognize," he said, "that we are the fellows who are going to get the most benefit out of good roads. All you motorists get is a little pleasure out of them, but we are going to get the dollars and cents out of them by being able to haul our goods to the market."

George C. Diehl.
Chairman of the Committee on Road Demonstrations.

E. R. Thomas, called on by Toastmaster Hotchkiss to say a word for the Thomas Flyer in the New York to Paris race, said he hoped the time would soon come when it would be possible for an auto to go through to San Francisco without a broken axle or even so much as a punctured tire. The modest maker of the Thomas Flyer, who was the last speaker of the evening, got a warm reception from the banqueters.

The Automobile Club of Canada was ably represented by the vice-president, U. H. Dandurand, who brought greetings from the Canadian automobilists and invited his American brethren to cross the line early and often.

Charles J. Glidden, "of the world," as Toastmaster Hotchkiss introduced him, sketched briefly his foreign tours and the roads over which they had carried him and expressed his pleasure at being present at a convention which was destined to be productive of so much good to the movement in this country.

At the speakers' table, in addition to Toastmaster William H. Hotchkiss, were Powell Evans, president of the Automobile Club of Philadelphia; U. H. Dandurant, president of the Automobile Club of Canada; Congressman W. W. Cocks, Senator J. P. Allds, ex-Lieutenant-Governor Timothy L. Woodruff, of New York; ex-Governor N. J. Bachelder, of New Hampshire; Mayor J. N. Adam, of Buffalo; Highway Commissioner James H. McDonald, of Connecticut; Neal Brown, president of the Wisconsin State Automobile Association; Charles J. Glidden, the globe-girdler; First Vice-President Lewis R. Speare, of the A. A. A.; E. H. Butler, editor of the Buffalo *News;* E. R. Thomas, national Secretary F. H. Elliott, Harold Parker, A. W. Campbell, George B. Ellis and L. W. Page, director of the Offices of National Public Roads.

Some of the Actual Work of Road Building in New York State That Was Inspected by the Conventioners.

MAKERS AND A. A. A. REITERATE 1908 VANDERBILT RULES

IN response to a suggestion made in Paris to tbe foreign affairs committee of the American Automobile Association that the action of the foreign clubs in refusing to sanction the Vanderbilt Cup race of this year would be rescinded if the Racing Board of the A. A. A. would hold such race under the so-called Ostend rules, a meeting of the Central Conference Committee, representing the American manufacturing bodies and the American Automobile Association, was held in Buffalo Tuesday last. Among others who attended, including representatives of the N. A. A. M., A. M. C. M. A. and A. A. A., were President Thomas Henderson, General Manager S. A. Miles, and E. R. Thomas, of the National Association of Automobile Manufacturers, and President W. H. Hotchkiss, Chairman Jefferson deMont Thompson, A. R. Pardington and Secretary F. H. Elliott. The makers were also represented by S. D. Waldon and R. D. Chapin.

After a full discussion of the situation, both domestic and foreign, it was unanimously decided tbat, so far as the Vanderbilt Cup race of this year is concerned, the same should be held under the rules previously announced by the Racing Board of the A. A. A. In the opinion of those present, any other action at this time would be unfair to the American manufacturers, particularly in that it would now be impossible for them to build cars wbich would conform to the so-called Ostend rules; and, also, in that there is no assurance that the foreign bodies will continue to observe the Ostend rules next year. Subsequently, when the report of the Buffalo proceedings was shown to Alfred Reeves, general manager of the A. M. C. M. A., he unreservedly approved all that had been done. Mr. Reeves is just recovering from a hospital operation, and was unable to be at Buffalo.

The hope was expressed, however, that when a proper representation on the committee which shall frame the future racing rules for international contests is given to the American Automobile Association as tbe national governing body in the United States, and as representing more motor users than all of the foreign clubs combined, as well as an industry which turns out more cars annually than any other country, it would be possible to arrive at a formula equally satisfactory on both sides of the ocean, and thus to hold future international events under it.

In this connection it may be stated that besides having promises of at least ten representative American entries, the A. A. A. Racing Board is already assnred of the entry of four representative foreign cars, namely, a Mercedes and a Benz, which stood, respectively, first and second in the French race last week, and a Hotchkiss and a Renault, thus giving, even at this early date, the Vanderbilt Cup race its old-time international flavor.

The course that has been selected is approximately 25 miles long, and is stated by those who are familiar with it to be the fastest in the world, including, as it will, the completed section of the Long Island Motor Parkway and the State and county roads of Nassau county, within an hour's ride from New York.

A. C. A. "EXPLAINS" THE WHYFORE OF ITS FOREIGN RACE.

From the executive committee of the Automobile Club of America comes a statement as to why it thinks itself justified in running a race at Savannah for the foreign manufacturers, which event, it is averred, "would not have been organized if the American Automobile Association had seen fit to make the rules for the Vanderbilt Cup race accord with the internationally accepted conditions." In other words, the A. A. A. Racing Board should have considered tbe foreign makers first, and not American makers, an opinion not likely to be accepted here.

It is alleged in the "explanation" that at the recent Dieppe session of the international clubs "an unsuccessful attempt was made by the American Automobile Association to supplant the Automobile Club of America." The exact facts are that no effort whatever was made on the part of the A. A. A. committee at Dieppe to become affiliated in any manner at this time, it being made clear that an arrangement of any character whatever would carry with it the acceptance of the so-called Ostend rules. The province of the special committee was simply to make known to the delegates that it was the A. A. A. which controlled racing in America and had always conducted the Vanderbilt Cup race, and, furthermore, tbat if any foreign makers participated in the American race, they would have to accept the present rules, unless American makers agreed to modifying them.

The "explanation" is verbose and roundabout, and not in keeping with the facts known to exist, and, taken as a whole, it will accomplish little in relieving the club from the criticism levcled at it from all sides as a result of its present untenable position.

NEW JERSEY CLUB REPUDIATES RUMOR.

According to officers of the New Jersey Automobile and Motor Club, that organization has no idea whatever of resigning from the Associated Automobile Clubs of New Jersey, the State organization of the A. A. A. A meeting of the club is called for to-night, at which the subject will come in for some attention. The source of the rumor is well understood, but the club desires to place itself on record as being in favor of an organization like the A. A. A., which gives a local club local prestige, a State body control in its own State, and the whole framework joined together by national officers elected by the national board of directors selected by the State bodies.

A. L. A. M. STATES IT WILL MAKE DEALERS TOE THE MARK

NEW YORK, July 14.—Although there was no intention of making any public announcement to that effect, at least not for several weeks to come, the report of the fact that the Licensed Association had compelled the Peerless, Olds and Cadillac companies to cancel their agency contracts witb the Centaur Motor Company, Buffalo, on account of the latter taking on the Oakland, an unlicensed car, precipitated matters, and the A. L. A. M. is now making it plain that it intends to compel dealers to respect the agency clause in their contracts. In the past, the rule has not been observed very strictly, as there were so few low-priced cars in the licensed fold that the dealer who wished to have sufficient price latitude found it necessary to go outside. But things have been so shaping themselves in the past year that the licensed agent may now find an ample range under the aegis of the Selden mark, and it is the purpose of the Association to see that he thus confines his choice in future.

When seen at the Association headquarters, Assistant General Manager E. P. Chalfant, who is now in charge, confirmed the report, and stated that a quiet but vigorous campaign to compel all licensed dealers to closely observe the agency clause in their contracts was already under way and would be followed up. "The low-priced licensed car is the key to the situation, and, now that we have it, there can be no occasion for any licensed dealer going outside the fold," said Mr. Chalfant. "We have not been in a position to make too much of the agency clause hitherto, but in future it will be rigidly enforced."

PROGRESS OF THE A.A.A. TOUR.

(*Continued from page 76*)

of its springs in the Saturday run. To-day when three miles out a bumper was made from some old tire casings and inner tubes; and when 20 miles out and the only remaining good leaf broke a block of wood and other parts were used in effecting a repair. It got 181 points on time. The Overland roadster No. 110 ran in hard luck, breaking its frame and having to seek a blacksmith shop, where a repair was effected. As yet it is not known what time the car checked in and what is its penalty. According to the rules as interpreted by Chairman Hower at Sunday night's meeting at Bedford Springs a frame or spring can be repaired in a blacksmith shop providing the work is all done by the driver and mechanic. These two may use whatever tools of the blacksmith's they desire and providing no new finished parts are used the work will not be penalized. This law also covered the manufacture on the road to-day of the improvised bumper by the Franklin. In fact, the rules permit of buying a block of rubber and cutting out a crude bumper and fitting it without penalty. It is reported to-night that Overland No. 108, driven by Mrs. Shirley, will withdraw to-morrow. The runabout was debited 102 points on time to-day, which together with the 9 received on Saturday, gives it a total debit of 111 points.

The Hower perfect scores are now reduced to six, consisting of two Pierces, a Reo, a Premier and two Stoddard-Daytons.

The club and team standing to-night is as follows: Buffalo team one, 1,000 points; Buffalo team two, 1,000 points; Chicago Motor Club team one, 1,000 points; Chicago Motor Club, team two, 997.6 points; Rochester Club, team one, not known, perfect previously; Rochester Club, team one, 1,000 points; Bay State Club, 1,000 points; Cleveland, 663 points; Columbus Automobile Club, 1,000 points; Syracuse Club. 980 points. D. B.

FIFTH DAY—HARRISBURG TO PHILADELPHIA.

PHILADELPHIA, July 14.—By contrast with the two preceding days of mountain climbing and bumping the water breaks over the Allegheny and Blue Ridge ranges, to-day's run from Harrisburg was a restful joy ride. A run of 133 miles in 7 hours over such easily navigable stone roads as those of to-day was mere child's play for the cars. The journey was accomplished without a single perfect score car losing its place on the clean slate. In fact, but a single car suffered penalization. The Moline had hard going with its cracked cylinder, which put a pair out of commission, but managed to get into town around 9 o'clock with its two remaining ones doing the work. It had also stopped to mend its radiator. No 19 miles an hour gait over macadam roads will eliminate the American cars of to-day. The contestants, in fact, for the most part arrived from an hour to close to two hours ahead of schedule time. Then there was some lively scorching, in which the non-contesting cars behaved conspicuously. A seat on the rear was not safe enough to save Ben Smith, who rode as mechanic for Billy Hurlbert, to permit his being tossed out of the Garford's tonneau at the pace this road terror was pushing it. He has a cut cheek and a bruised shoulder as his souvenir.

The little fellows, notably the Reos, are holding up uncommonly well. They stood the mountain banging well, and the law will not allow a fast enough pace to permit their maintaining the time schedule. The Quaker City Motor Club met the caravan at Trappe, and escorted it into town. To-night it is giving the tourists a vaudeville smoker at Horticultural Hall. The Philadelphia *Press* was also in hospitable evidence at Trappe with a luncheon for every car.

The run to-day was through beautiful smiling farm lands. That we were in the land of William Penn was evident by demure old women and modest young girls in white lace caps and soft gray or brown Quaker garb, waving from the porches. The toll-gates were at short intervals, and were picturesque with their grape and flower arbors. In the region of Lancaster, not a few long-haired Mennonites were encountered, and around Reading the Pennsylvania Dutch greeted the tourists with a wee bit of a smile looming through their characteristic stolidity.

The caravan came into town by way of the beautiful Chestnut Hill suburbs, and then down Broad street, through "Automobile Row," to the night stopping place at the Walton. Tom Fetch, Ralph Estep and the freelance Packard made a detour at Collegetown to visit Washington's camp at Valley Forge, which the routemakers had cut out, just as they did Gettysburg, more's the pity. J. C. W.

Perfect Scores for All on the Fifth Day.

PHILADELPHIA, July 14.—For the first time since the start of the tour all of the Glidden and Hower contestants have made the run with perfect scores, there being not a single example of a car arriving late at the checking station or having to make a replacement of parts. This does not include No. 102 Moline, that cracked two cylinders yesterday, and it is not expected to contest for the Hower trophy after to-day. At 8 o'clock to-night it has not arrived, but a wire has been received announcing it at Reading, Pa. Owing to this perfect score day's run over 133.5 miles of rolling macadam roads with occasional water breaks, the team scores in the Glidden contest remain as they were yesterday, which is as follows:

Automobile Club of Buffalo, team 1	1000	points
" " " " 2	1000	"
Chicago Motor Club, " 1	1000	"
" " " " 2	937 2-3	"
Rochester Automobile Club, " 1	666.6	"
" " " " 2	1000	"
Bay State Automobile Club	1000	"
Cleveland Automobile Club	664	"
Columbus Automobile Club	1000	"
Automobile Club of Syracuse	666.6	"

The Hower standing is as follows:

No. 100	Great Arrow	1000	"
" 101	Reo	1000	"
" 102	Moline	949	"
" 103	Great Arrow	1000	"
" 104	Premier	1000	"
" 105	Gearless, withdrawn first day.		
" 106	Franklin, no points, continues as non-contestant.		
" 107	Stoddard-Dayton	1000	"
" 108	Overland, withdrawn, continues as non-contestant.		
" 109	Stoddard-Dayton	832	"
" 110	Overland	698	"
" 111	" withdrawn, continues as non-contestant.		
" 112	Stoddard-Dayton	1000	"
" 113	Blomstrom, withdrawn, continues as non-contestant.		

For Glidden certificates:

No. 16	Stevens-Duryea	1000	"
" 17	" "	1000	"

Although to-day's run is bereft of penalizations, not a few unusual incidents have arisen to be of sufficient import to satisfy the gossipers of the tour for one evening. William Hurlburt's No. 31 Garford, when making too fast time on the stretch of road to-day struck a water-break with sufficient impact to hurl one of the tonneau passengers out, who, landing rather heavily on the ground, suffered a slight scalp wound and a bruised shoulder, neither of which was sufficient to prevent his continuing his tour. The accident was entirely due to reckless driving, which was also noticeable on the part of Van Tyne, driver of No. 29 Garford.

Oakland Car No. 28, one of the contestants in the Chicago Motor Club Team No. 2 for the Glidden Trophy, in taking a water-break too quickly bent the front axle badly. The driver and mechanician sought a blacksmith shop, where the axle was removed, heated, reformed and replaced in 52 minutes.

The Marmon team is making a most favorable impression, as is the combination Premier and Reo teams. The Chicago Motor Club Team No. 1, composed of two Haynes cars and an Oldsmobile, is still in the perfect score category, the cars having run so far without any attention further than the usual overlooking and lubrication. D. B.

LATEST NEWS A. A. A. TOUR.

SIXTH DAY.

MILFORD, PA., July 15.—To-night six of the twelve running days of the Glidden tour are over, and 706.8, or 42 per cent., of the total distance of 1,669.7 miles has been covered. Of the ten teams struggling for the Glidden trophy, six are running with perfect scores, these being as follows: Buffalo team of three Pierce-Arrows; Buffalo team two, comprised of two Premiers and a two-cylinder Reo; Chicago Motor Club team No. 1, made up of two Haynes and Oldsmobile; Rochester club team two, of three Studebakers; the Bay State club team of three Marmons, and the Columbus club team of three Peerless cars. Marmon and Studebaker have teams all of their own, and Haynes, Oldsmobile, Premier and Reo are the four other makes represented. So that with the tour half over there are eight makes of cars still on the ground floor and on equal footing for the trophy. The summarized club standing is:

Buffalo	Pierce	1,000	points
Buffalo	Premier-Reo	1,000	"
Chicago	Haynes-Oldsmobile	1,000	"
Rochester	Studebaker	1,000	"
Bay State	Marmon	1,000	"
Columbus	Peerless	1,000	"
Chicago	Oakland-Rainier	997.6	"
Rochester	Thomas-Gaeth-Selden	666.6	"
Cleveland	Garford	664	"
Syracuse	Franklin	666.6	"

The two Stevens-Duryea cars running for Glidden certificates are in the perfect score brigade still. Of the fourteen original Howers, only five are perfect, namely: two Pierce cars, two Stoddard-Daytons and one Premier.

The tour now has settled to perfection and regularity in every detail; the drivers are not beating it except some of those who are hopelessly out of it, and everybody is as methodical as if living at a Quaker home. The grandstand work of former years is absent, and it is a fight to the finish among all of the contestants. Only one of the observers has dropped out because of sickness, he being the one appointed by Mrs. Cuneo. But three women are in the tour: Mrs. Andrew Cuneo, who drives the Rainier, and with her Mrs. Berwick, and Mrs. Howard Marmon, who rides with her husband in a Marmon car.

In the Philadelphia to Milford run the first car rushed into Milford and stored at the official headquarters, the Bluff House, at 12:35 P.M. It had been a day of excellent macadam roads, and delightful scenes surprised the tourists, who were treated to a ride that will long be in their memory.

The first car was checked out at 7 o'clock sharp, and the day's running time was 6 hours 45 minutes. There was not five minutes of bad road the whole distance. The first 50 miles traversed are over country varying from level to hilly and the balance of the trip, which led through the scenically beautiful Delaware Water Gap, was over narrow roads, with steep hills and numerous sharp, dangerous turns. Despite this, every car in the run came through at high speed. The reception all along the line was most enthusiastic and the summer guests from Delaware Water Gap were intensely enthusiastic in their welcome. The occupants of the cars were given bouquets of flowers, as well as eatables and drinkables.

There were a number of lame ducks strewn along the road, but none of these were in serious difficulties. No. 98, the Premier Pilot car, went down and out a short distance out of Nazareth. The road is being repaired, and the car came along at high speed and dashed into some loose rock that had been piled in the center of the road. The front axle was broken off short.

D. B.

PRESIDENT TISCHBEIN HERE FOR SHORT STAY.

Willy Tischbein, president of the Continental Caoutchouc and Gutta Percha Company, of Hanover, Germany, as well as of the Continental Caoutchouc Company of New York, has arrived from Europe and will spend a short time in the United States in connection with the affairs of the Continental Company. He had some interesting observations to make.

NEWS FROM AMERICA'S RUBBER CENTER.

AKRON, O., July 13.—The Diamond Rubber Company is preparing to make extensive enlargements of its plant, having purchased 14 houses and lots on the south side of Jackson street, opposite from the present plant. The officers of the company are reticent about their plans, but they have already started one building for a machine shop, and have submitted plans to the city for an overhead bridge on the street. The company has been crowded for space throughout the recent busy season in tire manufacturing. It is also the plan of the company to move the Marsh factory here from Columbus, and it is thought that the new buildings are designed for the manufacture of the rims. The new plans include an outlet to the next street south of Bartges street.

The officers of the Motz Clincher Tire Company are well satisfied with business of the past year, and favorable reports were heard at the annual meeting held this week. The following directors were chosen: Charles Motz, Gus Burkhardt, E. J. Alderfer, Nicholas Seil, Howard Haupt, and Paul E. Bertsch. The directors chose officers as followows: President, Charles Motz; vice-president, Gus Burkhardt; secretary and treasurer, Nicholas Seil, Akron thus being well represented.

It is not a matter of common knowledge that women engage in rubber manufacturing in this city, as well as in others, to a large extent, and that there are female tire makers in this city to the number of 35. Valuable and interesting statistics have been gathered by the State Labor Commissioners on the rubber and other tire industries in this city, and the most recent report shows 653 females engaged in the manufacture of rubber goods in seven rubber plants of Akron. What are known as rubber workers proper number 487, and their average annual wage during 1906 was $402.99. The average annual wage of the tire makers that year was $378, and the other female rubber workers and the annual pay was as follows: Forewomen, two; $368.40; helpers, five; $230.25; laborers, sixty-eight; $316.40; pinchers, eighteen; $385.02; packers, six; $351; press workers, fifteen; $280.

BRISCOE'S TRANSCONTINENTAL CHALLENGE.

For the first time in several years the Maxwell cars have not been entered in the A. A. A. tour for the Glidden trophy, and coupled with a statement of the reasons therefor, Benjamin Briscoe, president of the Maxwell-Briscoe Motor Company, issues a *defi* to the winning car. The test, should it be carried into effect, is to consist of an endurance run from Coast to Coast for $2,500 a side, the winner to dispose of the $5,000 purse, and the challenge is aimed at the car which comes out victorious in the tour now under way. The principal reason for the non-entry of a Maxwell team this year is the alleged discrimination against the light-low-priced car of the present revised rules, so that the conditions of the challenge are that it be run under the Glidden tour rules of 1907.

CHALMERS-DETROITS TO HAVE MARSH RIMS.

DETROIT, July 13.—What is doubtless the largest detachable rim contract ever placed by a single manufacturer of automobiles has just been negotiated by the Chalmers-Detroit company with the Diamond Rubber Company, Akron, O. It calls for sufficient rims to supply the output of 2,500 Chalmers-Detroit, 30-horsepower cars for 1909. It is said to be one of the first, if not the initial large contract for 1909 accessories. The sale of Marsh rims this year has been practically doubel that of 1907 and indications at present point to a much increased demand from now on.

A new automobile factory is to be located at Moline, Ill. It is the Velie Motor Vehicle Company, and will manufacture gasoline, electric and steam cars. All the promoters are connected with the Velie Carriage Company. They are W. L. Velie, O. E. Mansur and S. Harper.

VOL. XIX NEW YORK—THURSDAY, JULY 23, 1908—CHICAGO No. 4

THE AUTOMOBILE

Once More the Reliability of the American Automobile is Convincingly Told by the A.A.A Tour

GLIDDEN TROPHY PERFECT SCORE CARS FOR 1908.

1. Pierce Arrow	7. Peerless	15. Rainier	24. Studebaker
2. Pierce Arrow	8. Premier	16. Stevens-Duryea	26. Studebaker
3. Pierce Arrow	10. Gaeth	17. Stevens-Duryea	27. Oakland
4. Reo	11. Thomas	19. Haynes	30. Garford
5. Peerless	13. Franklin	20. Haynes	35. Oldsmobile
6. Peerless	14. Franklin	21. Marmon	

HOWER TROPHYITES.

100. Pierce Arrow
103. Pierce Arrow
104. Premier
107. Stoddard-Dayton
102. Stoddard-Dayton

PERFECT CLUB TEAMS.

Automobile Club of Buffalo, No. 1.
Columbus Automobile Club.
Chicago Automobile Club, No. 1.

HOW THE TIED CARS WILL CONTINUE

THE STRENUOUS MOTOR BATTLE TO A FINISH

SARATOGA SPRINGS, N. Y., July 23.—Twenty-three American touring cars and five American runabouts this afternoon completed with perfect scores what was known as the "Fifth Annual Reliability Tour of the American Automobile Association." No more trying task has ever been asked of automobiles than this 1,675-mile run which started at Buffalo and finally has reached here after traversing Pennsylvania, New York, Massachusetts, New Hampshire, Maine and Vermont. Herewith is the honor roll:

Touring Cars.—No. 1, Pierce; No. 2, Pierce; No. 3, Pierce; No. 5, Peerless; No. 6, Peerless; No. 7, Peerless; No. 19, Haynes; No. 20, Haynes; No. 13, Franklin; No. 14, Franklin; No. 16, Stevens-Duryea; No. 17, Stevens-Duryea; No. 24, Studebaker; No. 26, Studebaker; No. 35, Oldsmobile; No. 21, Marmon; No. 4, Reo; No. 8, Premier; No. 10, Gaeth; No. 11, Thomas; No. 15, Rainier; No. 27, Oakland; No. 30, Garford.

Runabouts.—No. 100, Pierce Arrow; No. 103, Pierce Arrow; No. 107, Stoddard-Dayton; No. 112, Stoddard-Dayton; No. 104, Premier. (These five contended for the Hower Trophy.)

Three club teams are tied for the Glidden trophy: Buffalo—No. 1, Pierce; No. 2, Pierce; No. 3, Pierce. Columbus—No. 5, Peerless; No. 6, Peerless; No. 7, Peerless. Chicago—No. 19, Haynes; No. 20, Haynes; No. 35, Oldsmobile. The last named car is being driven by Andrew Auble, of Akron, Ohio, who says to-night he must return home because of business matters. Therefore, if he does so, the Haynes pair will be unable to continue, which means that the Buffalo Pierceites and the Columbus Peerless team will fight it out if it takes all Summer. That plan is the program to-night and in the morning these two teams and the five tied runabout contenders will continue the motor-driven battle, first going to Buffalo and then starting anew over the route of the tour.

Chairman Hower, and globe-girdler Glidden express great satisfaction at the result of the tour which they consider an unquestioned and convincing triumph for the product of the American industry.

The City of Springs gave the tourists a warm welcome at the conclusion of the twelve-day journey. Great crowds thronged the main street to greet the dust-grimed caravan and the Saratoga Automobile Club supplied an appreciated luncheon in the court of the Grand Union Hotel, before which Chairman Hower's pacemaker drew up at 2:36 P. M. followed by a dozen contending pursuers. The car had left Bethlehem, N. H., at 5:18 A. M. and kept to its schedule all the way. Outside of Rutland 115 miles from the start, the contestants caught the pacemaker. The terror of to-day's 184-mile run had been dinned into the caravan since the tour began and a knockout was feared on the 9 hour, 20 minute schedule set for the trip. But for the teriffic climb up and coast down the Green Mountains with water breaks innumerable the route was not a sufficient handicap to stop any of the indomitable auto pack from schedule making. From a scenic standpoint the run was quietly picturesque. It see-sawed across the Connecticut river between Vermont and New Hampshire and skirted and climbed the Green Mountains

Three Pierce Arrows—The Perfect Score Team of the Chicago Motor Club.

enroute. Then it entered New York in the pretty Lake Champlain region and followed the foothills of the Adirondacks into Saratoga over a macadam wind-up of several miles. Hospitality galore was extended enroute.

The only car to drop out of the strenuous game on the concluding day was No. 23 Marmon, driven by Howard Marmon, with a cracked cylinder casting at about half the distance and immediately withdrew. Several noteworthy performances in the tour deserve special mention. Mrs. Cuneo drove her Rainier with a perfect score, a feat in woman's participation in automobiling that is historic. That one of the Chicago Motor Club's teams made up of $2,750 cars, two Haynes and an Oldsmobile, should have finished even with two of the highest powered and priced trios with the small handicap allowed them under the rules, was a significant achievement for cars of medium cost and power. R. M. Owens' piloting of a little two-cylinder Reo touring car into the perfect score division, thus repeating his performance of last year, was another praiseworthy effort.

The performance of the Pierce and Peerless trios was marvelous in its perfection. A record that is unequaled in the annals of touring contests is that of W. S. Stroub, who not only drove his Peerless without an adjustment but without even pumping air into his tires. A. G. B.

Columbus Automobile Club's Team of Perfect Score Peerless Cars.

THE ELEVENTH DAY.

BETHLEHEM, N. H., July 23.—As a result of the pranks of the weather man, the tourists had an easier run of it today than the powers-that-be had intended to frame up for them. It rained last night, and before Chairman Hower started out in his pace-making car this morning it looked more than merely threatening, the prospects being such that Mr. Hower was certainly justified in changing his fair-weather schedule of 6:40, that had been slated for the day, to a rain time-table of 7 hours and 30 minutes. It did begin to come down a bit between the intervals of the start, which was delayed until 7:30 A.M., owing to "Sunny Jim, the confetti tosser," not having been routed out of his downy couch in good season. Bad weather was imminent up to 10 o'clock, but after that the sun god put Jupiter Pluvius to flight and gave glorious sunshine and dry winds from the fifty-mile point on to the night stop at Bethlehem.

The run was one of varied beauty, retracing for a dozen miles the Rocking Horse hills through the thick woods of yesterday. Farther on the caravan struck the Androscoggin, and bowled along its banks for some fifty miles. Then the tourists entered the White Mountain region and skirted the bases of the steep green slopes and cloud-enveloped peaks of the Presidential range. The road surface was excellent, though a bit soft in spots. The route passed through scores of resort towns and by summer hotels, where pretty girls in swarms and, in fact, the whole countryside turned out to convey a greeting to the fleeting cars.

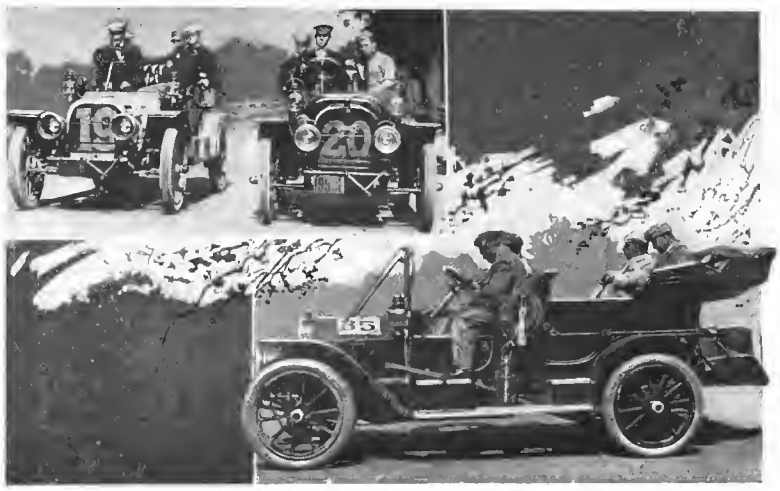
At the Sinclair House, at Bethlehem, the many tourists found a bed apiece waiting them, and turned in promptly, a number turning out early enough the next morning to view the fine scenic environments of the highest turn in New England. Throughout the tour there has been reiterated in joke the query, "If anything should happen to Hower?" and something did happen to Hower to-day. As he was bowling along in the pace-making car at the easy pace called for by the schedule, Winchester's Great Arrow encountered a team of skittish horses, and in giving them a wide berth the inside wheels of the pace-maker ran close to a sandy bank with a drop of six feet. The edge crumpled and gave way. Hower was thrown out and rolled down the bank into a wire fence, while Glidden jumped and had a roll all to himself. The car tilted acutely but did not go over, or there might have been a tale of a crushed chairman and a flattened out trophy-donor to tell. Just then Teddy Day caught the advance guard and Hower went aboard, continuing his pace-making in schedule time.

The resourceful Tom Fetch happened to be behind the pace-making car with the "El Toro" Packard. Tom got busy at once. He dug a trench for traction, called for volunteers to hold the car from toppling over, attached a wire cable, and then started the Packard. In the first attempt the cord snapped, but the second try was a success, and landed the Great Arrow on *terra firma* in a jiffy. "Good Samaritan I am" had no chance to rescue unfortunates in this tour. Last year he pulled a car out of a canal, and the year before went to the

relief of several parties stranded for bait on the course. To-day was Tom's first busy day, for to-night he started out to bring in Billy Hurlbut, whose tin axle had again given out, near Gorham, and to pick up the crew of Marmon, No. 22, which was down and out 59 miles to the rear, with a broken wheel which put it entirely out of the running.

Mrs. Cuneo's Lively Driving.

Mrs. Cuneo, by the way, was so long delayed at Rangeley adjusting a fan that she had to drive her Rainier 130 miles in 5 hours and 25 minutes to save her clean score. No clean-score cars left any points to-day, and a run-off of Glidden and Hower trophy ties is so certain that the chairman, at to-night's meeting, requested those tied for places to meet him at the Grand Union to-morrow night to arrrange the details of the run-off, which he hopes to be able to begin Friday morning. J. C. W.



Chicago Motor Club's Perfect Score Team—Two Haynes and Oldsmobile.

HOW THE SCORES SUFFERED ON WEDNESDAY.

BETHLEHEM, N. H., July 22.—No perfect-score cars suffered on to-day's run of 130 miles from Rangeley Lakes here, through the White Mountains, but in all fourteen cars had difficulties of one nature or another. No. 22, Clark's Marmon, that had brake trouble yesterday, broke a wheel to-day when it took a ditch near Bethel, seventy miles out, the report being the trouble was caused when turning out to pass a team. This car is not in yet, and took the full 1,000 count of debit marks. It will complete the run to Saratoga as a non-contestant. No. 28, Oakland, got nine points on time caused by being late in leaving Rangeley this morning. The car had hard luck yesterday, breaking a spring, and having to take up the connecting rods to-day. It made slow time throughout the majority of the trip.

Tuesday had been cloudy, and rain that had threatened all day started to fall about six o'clock, and continued in a perfect downpour all during the night. The schedule had been announced as six hours and thirty minutes.

Mr. Hower did not start until half an hour after his regular time, and the competing cars were not allowed to check out until 7:30, instead of 7 o'clock. It was noticeable that, despite the fact that the rain had stopped, the big cars were not as anxious to be checked out first, as they had been in fair weather, and held back. All of the entrants seemed a little inclined to let someone else go first and break the roads for them. The Pierce team was to the forefront and got away early, and brave little Mrs. Cuneo followed close behind. All of the entrants immediately after checking out stopped to put on their tire chains, some of them putting chains on both front and rear wheels, in order not to take any chances in the mountain roads, which were reported to be in very bad condition. This report proved to be without foundation, in fact, however, for the roads proved to be as good and in many places even better than those met on any stage of the run except the trip from Albany to Boston. Apart from one or two showers there was no rain to speak of during the day, and the mountain roads, which had dried up very quickly, were excellent.

The route led from Rangeley to Madrid, retracing Tuesday's route to this point, to Weld, Dixfield, Mexico, Rumford Falls, Rumford Centre, Rumford Point, Hanover, Newry, North Bethel, Shelburne, Gorham, Randolph, Cherry Mountain, Carroll, Bethlehem Junction and Bethlehem.

The day was one of many mishaps, and Mrs. Cuneo had to do some fast driving to keep her perfect score intact. She lost an hour in taking the fan belt off her machine and patching it, and as a result had to make the trip over the mountains at high speed. She made the last eight miles into Bethlehem in 14 minutes. She was ahead of time, and checked in amid the cheers of the guests who lined the hotel porch, and the loud applause of the tourists.

No. 110, Overland, went about twenty miles out of Rangeley on a narrow mountain road, dropped into a deep hole, and the rear axle was snipped off close to the spring seating. A fence rail was secured and the machine was pried off the road so as not to block the other cars. Repairs will be made and the car will endeavor to join the tourists in order to be in at the finish at Saratoga.

No. 24, Studebaker, met with an accident near Shelburne, which came very near putting both it and its passengers out of commission. The road approaching a sharp but hidden turn to a bridge was particularly good. The car came along at high

Bay State A. A. Team, Two of which Were Unlucky Near the Finish.

speed, and the driver was almost on the turn before he saw it. He was unable to slacken the speed of the car a great deal and took a chance, swinging the corner at high speed. The machine skidded, nearly went over, and, before the driver could regain control of it, crashed into the bridge. The car continued after replacing a tire, which was torn off when the skid occurred.

Car No. 18, the Gabriel Horn Oldsmobile, skidded when a few miles out of Rangeley, and, striking a stone in a ditch, bent its rear axle. Driver Foster managed to run the car to Bethlehem, despite the fact that one of the rear wheels was badly out of line. He took it to a blacksmith shop and made repairs. Car No. 101, one of the Reo entries, was slightly delayed as a result of the necessity of tightening up its transmission.

Car No. 23, Marmon, was delayed by tire trouble, but finished on time. No. 111, Overland, was delayed on route as a result of the necessity of making adjustments to its engines.

No. 4, Reo, went to a blacksmith shop and repaired a broken rear axle truss rod. A number of the machines are running with broken or missing parts. Van Tine's Garford has no starting crank, and it is necessary to push the car until it gets under headway and then throw in the gears in order to start the engine. No. 24, Studebaker, has its oiler driving gear broken and is splash oiling its engine. No. 12, Franklin, is running under the same conditions as a result of a broken oiler-pipe.

In keeping with a desire expressed by the tourists that they be allowed to check out at 6 o'clock for the last day's run instead of 7 o'clock, the usual hour, in order that they might reach the finish line early on Thursday, the cars will check out in the same manner that they did at Buffalo, *i. e.*, in the numerical order that their entries were received. This is to avoid any friction as to which cars are to go into Saratoga first, and will prevent racing to reach the finish line. The competing cars will be held up a few miles out of Saratoga by the chairman, and will go into the city in numerical entry order in one line to the finish point at the Grand Union Hotel.

Time Schedules, Tuesday, July 21.—Poland Spring to Rangeley, 142.7 miles, schedule seven hours twenty minutes.

Class.	Hours.	Minutes.	Miles per hour.
A (Glidden)	7	20	19.5
B (Glidden)	7	30	19.
C (Glidden)	7	40	18.6
D (Glidden)	7	50	18.2
A (Hower)	7	20	19.5
B (Hower)	7	30	19.

Time Schedules, Wednesday, July 22.—Rangeley to Bethlehem, 130 miles. Schedule, seven hours forty minutes.

Class.	Hours.	Minutes.	Miles per hour.
A (Glidden)	7	30	17.3
B (Glidden)	7	40	16.9
C (Glidden)	7	50	16.5
D (Glidden)	8	None.	16.2
A (Hower)	7	30	17.3
B (Hower)	7	40	16.9

TOURING CAR SUMMARY OF THE FIFTH ANNUAL A. A. A. TOUR, 1908

No.	CAR	H.P.	Entrant	Driver	Club	1st Day	2nd Doy	3d Doy	4th Day	5th Doy	6th Doy	7th Doy	8th Doy	9th Doy	10th Doy	11th Day	12th Day	Final C'd't,
1	PIERCE ARROW	60	Chas. Clifton	"Teddy" Dey	Buffalo, 1	0	0	0	0	0	0	0	0	0	0	0	0	1000
2	PIERCE ARROW	60	Chas. Clifton	A. Kumpf	Buffalo, 1	0	0	0	0	0	0	0	0	0	0	0	0	1000
3	PIERCE ARROW	60	J. W. Maguire	J. W. Maguire	Buffalo, 1	0	0	0	0	0	0	0	0	0	0	0	0	1000
5	PEERLESS	30	E. H. Parkhurst	Chas. Burman	Columbus	0	0	0	0	0	0	0	0	0	0	0	0	1000
6	PEERLESS	30	E. H. Parkhurst	W. C. Straub	Columbus	0	0	0	0	0	0	0	0	0	0	0	0	1000
7	PEERLESS	30	E. H. Parkhurst	H. D. Savage	Columbus	0	0	0	0	0	0	0	0	0	0	0	0	1000
19	HAYNES	40	F. H. Nutt	F. H. Nutt	Chicago, 1	0	0	0	0	0	0	0	0	0	0	0	0	1000
20	HAYNES	30	C. Wagoner	C. Wagoner	Chicago, 1	0	0	0	0	0	0	0	0	0	0	0	0	1000
35	OLDSMOBILE	40	F. L. Smith	A. Auble	Chicago, 1	0	0	0	0	0	0	0	0	0	0	0	0	1000
13	FRANKLIN	42	J. Wilkinson	C. Harris	Syracuse	0	0	0	0	0	0	0	0	0	0	0	0	1000
14	FRANKLIN	42	F. H. Stillwell	H. S. Bate	Syracuse	0	0	0	0	0	0	0	0	0	0	0	0	1000
16	STEVENS-DURYEA	35	J. F. Duryea	C. C. Smith	Springfield	0	0	0	0	0	0	0	0	0	0	0	0	1000
17	STEVENS-DURYEA	35	I. H. Page	I. H. Page	Springfield	0	0	0	0	0	0	0	0	0	0	0	0	1000
21	MARMON	50	F. E. Wing	F. E. Wing	Bay State	0	0	0	0	0	0	0	0	0	0	0	0	1000
24	STUDEBAKER	30	E. V. Stratton	W. H. Yeager	Rochester, 2	0	0	0	0	0	0	0	0	0	0	0	0	1000
26	STUDEAKER	30	E. V. Stratton	B. P. Yeager	Rochester, 2	0	0	0	0	0	0	0	0	0	0	0	0	1000
4	REO	18	R. M. Owen	R. M. Owen	Buffalo, 2	0	0	0	0	0	0	0	0	0	0	0	0	1000
8	PREMIER	30	R. M. Owen	H. L. Hammond	Buffalo, 2	0	0	0	0	0	0	0	0	0	0	0	0	1000
10	GAETH	35	P. Gaeth	P. Gaeth	Rochester, 1	0	0	0	0	0	0	0	0	0	0	0	0	1000
11	THOMAS	70	G. G. Buse	G. G. Buse	Rochester, 1	0	0	0	0	0	0	0	0	0	0	0	0	1000
15	RAINIER	50	Mrs. Cuneo	Mrs. Cuneo	Chicago, 2	0	0	0	0	0	0	0	0	0	0	0	0	1000
27	OAKLAND	20	J. B. Eccleston	H. Bauer	Chicago, 2	0	0	0	0	0	0	0	0	0	0	0	0	1000
30	GARFORD	40	A. R. Davis	G. Stevens	Cleveland	0	0	0	0	0	0	0	0	0	0	0	0	1000

No.	CAR	H.P.	Entrant	Driver	Club	1st Doy	2nd Doy	3d Doy	4th Doy	5th Doy	6th Doy	7th Doy	8th Doy	9th Doy	10th Doy	11th Doy	12th Day	Final C'd't
28	OAKLAND	20	E. M. Murphy	R. J. Goldie	Chicago, 2	0	7	0	0	0	0	0	0	42	0	9	0	940
31	GARFORD	40	A. R. Davis	W. B. Hurlburt	Cleveland	0	0	8	0	0	0	0	0	0	0	0	0	992
23	MARMON	50	W. C. Marmon	W. C. Marmon	Bay State	0	0	0	0	0	0	0	0	0	0	0	1000	
22	MARMON	50	W. C. Marmon	W. Clark	Bay State	0	0	0	0	0	0	0	0	0	8	992		
25	STUDEBAKER	30	E. V. Stratton	W. Jones	Rochester, 2	0	0	0	0	0	0	0	0	1000				
9	PREMIER	30	H. O. Smith	J. W. Moore	Buffalo, 2	0	0	0	0	0	0	0	1000					
12	FRANKLIN	28	H. H. Franklin	C. H. Talbot	Syracuse	0	0	0	0	0	0	1000						
32	SELDEN	30	R. H. Salmons	R. H. Salmons	Rochester, 1	0	0	0	0	1000								
29	GARFORD	40	A. R. Davis	H. A. Van Tine	Cleveland	0	1000		0	1000								

CLUB STANDING FOR THE GLIDDEN TROPHY IN FIFTH ANNUAL A. A. A. TOUR, 1908

CLUB	1st Doy	2d Doy	3d Doy	4th Doy	5th Doy	6th Doy	7th Doy	8th Doy	9th Day	10th Doy	11th Doy	12th Day	Final C'd'd
AUTOMOBILE CLUB OF BUFFALO, No. 1	0	0	0	0	0	0	0	0	0	0	0	0	1000
COLUMBUS AUTOMOBILE CLUB	0	0	0	0	0	0	0	0	0	0	0	0	1000
CHICAGO MOTOR CLUB, NO. 1	0	0	0	0	0	0	0	0	0	0	0	0	1000
CHICAGO MOTOR CLUB, NO. 2	0	2½	0	0	0	0	0	0	0	0	0	0	1000
ROCHESTER AUTOMOBILE CLUB, NO. 2	0	0	0	0	0	0	0	0	14	0	3	0	983
AUTOMOBILE CLUB OF BUFFALO, NO. 2	0	0	0	0	0	0	0	0	333½	0	0	0	666½
ROCHESTER AUTOMOBILE CLUB, NO. 1	0	0	0	0	0	0	333½	0	0	0	0	0	666½
SYRACUSE AUTOMOBILE CLUB	0	0	0	333½	0	0	0	0	0	0	0	0	666½
CLEVELAND AUTOMOBILE CLUB	0	333½	2½	0	333½	0	0	0	0	0	0	0	666½
BAY STATE AUTOMOBILE ASSOCIATION	0	0	0	0	0	0	0	0	0	2½	333½	333½	333½

SCORE OF THE CONTESTANTS FOR HOWER TROPHY IN FIFTH ANNUAL A. A. A. TOUR, 1908

No.	CAR	H.P.	Entrant	Driver	1st Doy	2d Doy	3d Doy	4th Doy	5th Doy	6th Doy	7th Doy	8th Doy	9th Doy	10th Doy	11th Doy	12th Day	Final C'd't
100	PIERCE ARROW	40	R. D. Garden	R. D. Garden	0	0	0	0	0	0	0	0	0	0	0	0	1000
103	PIERCE ARROW	40	Chas. Clifton	E. R. Retting	0	0	0	0	0	0	0	0	0	0	0	0	1000
104	PREMIER	30	G. A. Weidely	G. A. Weidely	0	0	0	0	0	0	0	0	0	0	0	0	1000
107	STODDARD-DAYTON	45	G. P. Moore	G. P. Moore	0	0	0	0	0	0	0	0	0	0	0	0	1000
112	STODDARD-DAYTON	45	R. G. Cox	R. G. Cox	0	0	0	0	0	0	0	0	0	0	0	0	1000
101	REO	18	R. M. Owen	R. L. Lockwood	0	0	0	0	0	0	0	0	0	0	0	0	1000
110	OVERLAND	22	J. N. Willys	C. P. Brockway	0	0	0	0	1¤	0	0	0	0	0	0	0	988
109	STODDARD-DAYTON	45	H. C. Tillotson	C. C. Miller	0	0	0	302	0	33	0	0	0	0	0	0	665
102	MOLINE	35	W. H. Vandervoort	W. H. Vandervoort	0	0	168	Withdrew. Fire in carbureter.									
108	OVERLAND	22	Mrs. Shirley	Mrs. Shirley	0	0	0	Cracked cylinder.									
106	FRANKLIN	16	F. A. Barton	J. Daly	0	0	9	102 Withdrew.									
111	OVERLAND	22	J. N. Willys	C. R. Forth	0	0	0	Broken spring.									
113	BLOMSTROM	20	A. L. Kull	A. L. Kull	0	0	Broke axle.										
105	GEARLESS	60	J. Breytogle	J. Breytogle	0	0	Withdrew. Hit Telegraph Pole.										

STORY OF SEVENTH DAY—MILFORD, PA., TO ALBANY, N. Y.

ALBANY, July 16.—From Milford, Pa., to New York's State capital it is 158.5 miles. The time schedule required it to be made in 8 h. 15 min., a 19-mile-an-hour average. A proviso was made, however, there being clay roads from Kingston on, that, should it rain, which would make the going greasy, the schedule should be cut down to 9 h. 30 min. The weather clerk was in good humor, though, so the first schedule went.

The run was as easily made as have been all the others. As a matter of fact, the prevailing maximum speed limits of 20 miles an hour are proving over any sort of fair going utterly inadequate to hamper even the small cars in the contest. It must be a bad accident entailing a long stop that will prevent a car making up any delay that does not extend too far over one hour. The talk is that next year adjustment as well as replacement penalties may have to be added to secure more rapid elimination and not permit as many teams and runabouts evolving tied with perfect scores as at present seems likely when Saratoga is reached. In a word, American cars as a rule can now beat any speed limit that the laws will permit.

Buffalo's No. 2 Team Loses Its Place.

Another team fell a victim to-day to the fortunes of war. The Automobile Club of Buffalo's No. 2 trio lost its place in the front line through Premier No. 9, which was driven by Joe More and had H. O. Smith aboard, meeting with an accident at Kingston. In rounding an unexpected hairpin turn, which had fooled not a few of the drivers, Moore gave his steering gear too hard a wrench and put it out of commission so far as a repair within schedule time went. New parts not carried on the car, in fact, had to be used, which, under the rules brought disqualification. Mr. Smith received unanimous and sincere condolences, for he has been one of the most liberal supporters of the tour, having entered two touring cars and a runabout, and supplied a pathfinder and pilot car and a press car besides.

It was a glorious ride of 59 miles over fine stone roads from Milford to Newburgh, which continued with the same highway conditions to Kingston, 37 miles further on, the run to the Hudson being over picturesque hills and through farm lands fair to the eye. It gained in grandeur and variety during the ride to Albany, which was along the Hudson all the way. One had magnificent panoramas of America's Rhine and, landward, of the distant Catskills that lifted their heads through the light clouds that hovered over the western horizon.

Take the West Bank to Albany Hereafter.

It converted many to the west bank route to Albany, which has been too generally and ignorantly decried and avoided. It presents more open and picturesque country than the opposite shore. There are fine stone roads all the way to Kingston and from there on, as has been stated before, the clay roads are by no means bad except in wet weather. No finer route to the Delaware Water Gap from New York could be had than via Newburgh and Milford, which could be used, by the way, to avoid the repetition of the route more generally followed through New Jersey.

The men aboard "El Toro," the Packard press car, enlivened the early stages of the day's run by starting at daybreak and putting up good humored josh signs. On one tree was the query, "If anything should happen to Hower?" followed a hundred yards further on by "What the h—l do we care?" A sign "Toll Gate" in front of a saloon fooled many. A pond bore the sign, "Franklins, stop here," and on a rough shack was the notice, "A bath with every room." On a rock was painted "Cheer up, it ain't half bad"—Dai.

The Packard car got in later than usual, the outfit as a rule starting at the end and loitering along the way for luncheon, photographs and a good time generally. A story was put in circulation and on the wire that it had broken down and that its passengers had come in by train. The fact was that it had ripped off a tire in passing another car on a rough hill, stopped to replace it and loafed the rest of the way in. The story savored of the malicious, as inquiry would have easily disclosed the facts and proved by witnesses that the car deposited its passengers at the Ten Eyck between 8:30 and 9 o'clock. J. C. W.

TECHNICAL STORY OF THE MILFORD-ALBANY JOURNEY

ALBANY, N. Y., July 16.—To-day saw the blighting of the hopes of the second Buffalo team for the Glidden Cup, the No. 9 Premier touring car dropping out because of a broken steering knuckle, which occurred at the sharp turn out of Kingston. The car was delayed until the piece was welded and new parts used in the repair obtained, the result being 1,000 points against the car and the club standing lowered to 666.6 points. It appears that in this axle and steering parts, as well as in the front axle of the Premier Pilot, which broke in the Philadelphia-Milford run, chrome nickel steel was not used, as the axles were among the early ones and were deemed equal to the tour, not being used in the cars regularly sold. No. 28 Oakland, which bent a front axle earlier in the tour and visited a blacksmith shop, where it was heated and reformed, to-day developed a little sagging, which occasioned a quick repair. A length of square steel shafting one inch to the side was positioned under the axle extending from the steering knuckle jaw at one side to the same point at the other side. This was bent in the form of a strut rod and a piece of wood placed between its center and the axle. This done, plentiful wiring bound it to the axle, and the driver is confident that the member will give no further trouble before Saratoga is reached. The two Oakland touring cars are making a most favorable impression in the tour, carrying their four passengers every day. Both would have perfect scores had it not been for the carelessness of the driver on No. 28 allowing his motor to run dry and burning out a connecting rod bearing. The morning of the start from Buffalo many predicted that these newcomers in the field would be out of the running before Pittsburg was reached, but they are both making schedule time and are daily gaining in favor. They are demonstrating the value of the balanced two-cylinder vertical motor, which is without adherents in this country except in the Oakland and Brush ranks, but is very popular in French, English and German factories.

Radiator Troubles Have Been Frequent.

Gus Buse took occasion on to-day's easy run to repair his leaky radiator on the Thomas six. The radiator was removed and the leak discovered in the base. The soldering was quickly done, and forty-five minutes from the time the car was stopped it was ready to resume the trip. Radiators have given not a litlte trouble on the tour, and in the majority of cases it appears to be the system of support that is in fault, rather than the radiator construction, because the leaks are in the base plate or adjacent thereto. This condition suggests the ball-and-socket trunnion support that already has a few supporters.

Franklins Enjoy a Climb

Mrs Cuneo Gives Rainier a New Tire

In the Berkshires

Enough said

Arrival in Quakertown

A hasty look over the cars on their early arrival at Albany failed to disclose any evidence of the long daily runs, although nearly every driver had something to say on tire troubles. Wagner, driving Haynes No. 20, said that since he left Buffalo he has not touched a tire, not even having to put any air into them. Arthur Kumpf, driving a No. 2 Pierce, had his first puncture to-day and made the first change of a casing, replacing the punctured one, which was badly worn. The Rainier driven by Mrs. Cuneo fared badly, having a puncture and a blowout and requiring thirty-eight minutes for the two, which repairs were made with the motor running, thereby adding the lost time to the schedulc. The majority of drivers avail themselves of this rule and prefer to keep the motor running while repairing tires.

A Long Line Up to Check In.

The cars reached Albany at 2:40, Chairman Hower's Pierce leading, and closely folowed by the Gabriel horn Oldsmobile that is used daily to escort the leaders into the city. Many cars caught the pacemaker before Kingston was reached and, of course, had to trail him to Albany. In order not to enter too early a long halt was made several miles out, from which point the caravan cntcred in procession form. Pierces, Marmons, Stevens-Duryeas and Garfords were among those to enter with the pacemaker. Before these drivers could get their cars backd up to the curb in front of the Ten Eyck Hotel to await checking in, Burman, with his Peerless team, had arrived; Frank Nutt and Wagner with their Haynes had entered, closely followed by Aubel, in his Oldsmobile, a running mate of the Haynes machines; the Stoddard-Dayton runabout with a couple of others also entered. Van Tine's Garford lost its starting crank during the run and one or two complaints were heard regarding his passing contesting cars at too fast a clip, but no kicks were registered with the officials in regard to the matter so that no official notice has been taken. D. B.

ON THE EIGHTH DAY—FROM ALBANY, N. Y., TO BOSTON

BOSTON, July 17.—Boston, well represented by the Bay State Automobile Club, gave the caravan a warm welcome to the "City of Culture." A squadron of cars flying its colors rode out to Auburndale and lined up to greet the incoming tourists and escort them down the broad esplanade, Commonwealth avenue boulevard, into town. Mrs. J. S. Hathaway bore a magnificent bouquet of flowers which she presented to Mrs. Marmon, who is riding in a Marmon of the Bay State team. At the Somerset, which is the tour headquarters, Mayor Hibbard welcomed the tourists on behalf of the city and Lewis R. Speare, ex-president of the club, grected them in the club's name.

With good gravel roads through New York for 37.7 miles to the State line, and magnificent macadams the entire way across Massachusetts, save for a detour of some 22 miles between North Wilbraham and Warren, the day's run of 154 miles was easy of accomplishment in the 10 hours set by the schedule. There had been warnings of speed traps and inflexible automobile blue laws that caused fear that prison bars might be the bar to some one's perfect score. There was in consequence a close lookout for warning speed signs, but motorists en route only warned inquirers against Leicester. A very long, slow zone, much of it through widely scattered houses, was found through which the cars crept at a timid funeral pace. The outfit escaped the day's run with "unpinched ranks."

The day's run, however, put the Rochester Automobile Club's team out of the leading division. While crossing a rut at Warren, the rear wheel of Studebaker No. 25 collapsed. Its driver, W. G. Jones, had so long a wait for a new wheel he had 'phoned to Springfield for, that, though he was at the time an hour a half ahead of his schedule and made a fast run into Boston, he arrived 1 h. 4 min. late. The new wheel, however, would have disqualified him anyhow.

No more peacefully picturesque run could be picked out than that of to-day. The route carried one into the Berkshires at historic old Stockbridge, where Jonathan Edwards preached to the Indians and wrote his famous philosophical essay on "The Freedom of the Will." Then came a ride down the Housatonic valley, widely famed for its scenery. "Jacob's Ladder" was coasted, or, more properly, bumped down. Then came the Connecticut river, leading the caravan into Springfield.

The Springfield motor car industry rose to the occasion, and hospitably stopped the tourists to treat them to a liberal luncheon, provided by the Fisk Rubber Company, the Stevens-Duryea Automobile Company and the Knox Automobile Company. All but one hurrying car stopped for it, too. It was the first midday meal most of the contestants had had on the tour, and was a welcome change in the daily life of the tourists.

Worcester reached, the splendid macadam boulevards extending for 40 miles into Boston was ahead, with speeding temptations hard to resist. The 10-mile homestretch was through a string of Boston's beautiful suburbs down the glorious Commonwealth avenue parkway to the Somerset. J. C. W.

WHAT HAPPENED BETWEEN ALBANY AND BOSTON

BOSTON, July 17.—To-day's run of 194 miles from Albany to Boston, by way of Springfield, changed the aspect of the Glidden tour contest by the elimination of the Rochester Club team No. 2, of Studebaker make up, the member of this team to fall by the wayside being No. 25, driven by Jones, which wrecked its left rear wheel when going down a curving grade in the town of Warren, 127 miles out of Albany. The wheel had suffered a partial fracture earlier in the tour, and was looked upon by many of the tourists to be due to go out before the end of the week. The accident occurred about the center of slightly curving right hill. A sidewalk crossed it about the middle of the descent, and it was at this point the wheel gave way, every spoke being broken or twisted off at the hub. P. Estey, one of the Chicago newspaper representatives on the car, was thrown out of the tonneau when the wheel broke, and suffered an injury to his left leg, but was able to take a train to Boston, and will continue the tour. The car was pushed to the side of the road until a new wheel was secured, after which it continued the run to this point. The accident cost the entrant the full count of 1,000 points, which was a debit mark of 333.3 marks against the club, and gave it a credit standing of 666.6 marks. The car will continue the run as a non-contestant.

The elimination of the second Rochester team narrows down the Glidden trophy struggle to four teams, namely, Pierce of Buffalo, Peerless of the Columbus Club, Marmon of the Bay State Club and the Haynes-Oldsmobile team of the Chicago Motor Club. Prediction is rife here to-night that before Saratoga is reached at least two of these will be eliminated, leaving but a couple of perfect score teams for the committee to wrestle with when the end of the run is reached. This is largely a matter of speculation, and it is an even break among

the four remaining teams. In all of them the cars are running in the best possible condition, and the drivers have settled down to the strenuous task of forgetting speeding and keeping only the schedule before them. Three teams, Pierce, Peerless and Marmon, being composed of cars of one mark, are able to do more club or team work than the Chicago Motor Club team, composed of the Haynes cars, driven by Nutt and Wagner, and Aubel's Oldsmobile. It must be said of the only combination team remaining that excellent work is being done by these cars; the drivers are equal to every emergency, and the performance of the machines is the best that could be looked for in a contest of this nature.

Resourcefulness of the Factory Drivers.

To-day's run developed but few mechanical difficulties, due primarily to the easy schedule, of less than 20 miles per hour, with extra time for tire troubles. No. 16, Stevens-Duryea, suffering with a slight radiator leak, took advantage of the easy pace, and removed the radiator in front of a tin shop at Leicester, and with the aid of soldering iron welded the leak, which was at the base where the stud holding the radiator in position enters the base plate. An anxious mob gathered around to watch how quickly jobs of this nature can be done. Scarcely was the hood up before the two hose connections were off; a moment or two later the fan supports were detached, after which little remained but to lift the member out of position. By this time the two soldering irons were hot, the mechanician had the solder and acids ready, as well as a file to roughen the surface, and in a few minutes the radiator was repaired. At this juncture the *Motor Age* Reo, which had halted to watch the job, pushed ahead, and within an hour the repaired Stevens was up with it and pushing on at rapid pace towards Boston.

Another good example of the resourcefulness of the drivers and mechanics was evidenced entering Boston. Frank Nutt, in his Haynes, in taking some of the rough roads had struck the truss rod supporting his axle on a projecting rock and injured it. A halt was made in front of a blacksmith shop. In an instant Nutt had sized up the situation and decided the quickest way out of the difficulty was to make a new truss rod. The raw stock was soon cut to the required length, threads were cut on each end, the center bend was made, and then suitable nuts for the ends. This done, the positioning of it in the axle should have been a brief task, but was lengthened owing to the rod being a bit long. Once more Nutt's blacksmith ability was equal to the occasion. He hurried into the blacksmith shop and made a pair of heavy washers out of a length of small rod. These did the desired work, and the car was into Boston and had a long wait with the others before checking in time arrived.

How the Cars Are Groomed at Stops.

The stop at Springfield, Mass., 94 miles out of Albany, gave the public an excellent opportunity of observing the care bestowed on the cars by the driver and mechanician at each stopping point. *Motor Age's* Reo made an early start from Albany, and, averaging 20 miles an hour during the entire 94 miles, including the crossing of the Berkshires and climbing Jacob's Ladder, was into Springfield half an hour ahead of the chairman's car. With the chairman came a group of seven, five contestants and two press cars. Close behind Chairman Hower's Pierce was the Premier Century car, that had followed all the way out. Grouped behind were the two Marmons, followed by the entire group of five Pierce machines. It was most inspiring to see the two Indianapolis machines come in together, and more so to see the five cars on which Pierce reputation is staked enter in a bunch behind them. A little later came Burman with his No. 5 Peerless, and not far behind were two other Peerless machines. Mrs. Cuneo with her Rainier was an early arrival, and, on entering, she received her usual cheer. Scarcely had any of the cars halted before both sides of the bonnet were raised and the inspection and lubrication began. The floor boards in nearly every case were lifted out and a careful investigation made, followed by copious use of the oil can. Oilers were filled in the majority of cases; the Franklins injected oil into the crankcases as well as looking after the valve actuating mechanism; Mrs. Cuneo was on her knees oiling steering gear parts, while her mechanic took the magneto off and cleaned it thoroughly. In two or three cases the mechanic got on his back under the machine and examined every nut or bolt that there was a possibility of working loose. One enthusiast, after having gone over the entire machine, was not content until he had rearranged all of the tools in the tool box, his only excuse being that they rattled a little, and he thought the rattle might interfere with his following closely the working of the different parts of the car.

Oil Is Being Used Liberally.

It can be noted that more oil than necessary is being used in the majority of cases, and when the cars pull out of a control they are immediately lost in a cloud of blue smoke. Spring shackles are oiled with the utmost regularity; so are steering gear parts, and at these half-way stops compression grease cups are given a turn or two. The majority of the drivers and mechanics, when asked about it, say it is not necessary, but supplement this with the remark, "I am not taking any chances." While oiling and inspection are being done, the third passenger in the car is superintending the filling up of gasoline and water tanks, the rules being modified to permit of this. Many of the cars do not take on water except at the night stop. When asked, Paul Gaeth, driving his Gaeth car, stated that he never takes on water except at night stops, when practically all of the cars do. There are exceptions to the rule. McGuire stated at Albany that he had not taken a drop of water between Buffalo and Albany. The radiator question is much improved over a year ago, when the sight of steaming radiators in the mountain work was a frequent one. This prompts a slight digression regarding water jacket space. Many cars built in level States have in past years had radiator and jacket sizes designed for continuous use on rolling and hilly roads, but which capacity was inadequate for miles and miles of mountain and low speed work. Previous Glidden experiences have rectified this difficulty. The value of previous tours has so improved the brakes of cars that not a single case of hot brakes and the application of water and oil has been ferreted out.

Throwing Things Proves Dangerous Welcome.

What might have proved a serious accident happened to James McLean, observer in No. 14 Franklin. When passing through West Springfield, one of the enthusiastic maidens who lined the roadside to applaud the tourists threw a small apple, which struck the glass of his goggle, breaking it and causing three of the broken pieces to cut the eyelid. A doctor stitched the cut, and with a well-bandaged head McLean completed the trip. One similar example to this occurred when passing through Springfield, O., in the tour last year. The chairman could do good service by having the local press in communities along the road give warnings on this dangerous practice.

Van Tine, in No. 29 Garford, had a narrow escape on one of the sharp turns. He sped down a long hill, the foot of which is a sharp turn. In order to avert a collision with a buggy, the brakes were all applied, and the car, after almost turning around, skidded into a ditch, tearing off a tire. No further injury was caused. Hurlburt, driving No. 31 Garford, took a bridge too fast and struck the railing, ripping off a portion.

The mountain traveling of the last week has impressed upon many of the drivers the value of a four-speed gear-set for mountain use. Americans have often ridiculed the four-speed gear-set on foreign cars, claiming it was quite unnecessary, but continued days of mountain work show how valuable the fourth speed is. It is useless to punish a motor by having to use a poor gear ratio. It is better policy to have a greater variety, easily obtained in selective gear-sets. D. B.

HOW BOSTON ENTERTAINED THE DUST-GRIMED CAVALCADE

BOSTON, July 18.—In mapping out its program for the entertainment of its road-weary and dust-choked guests, the Bay State Automobile Club decided upon a very welcome shift from land to water, and headed the caravan on a special trolley to the boat for Nantasket Beach. A refreshing hour's sail down the bay past the harbor's many islands landed the tourists at Boston's Coney Island. There the party split. Some sought Paragon Park and its varied Dreamland-Luna Park frivolities. Others hustled for the bath houses and soon had all the refreshment they desired in water ten degrees below normal.

Toward 5 o'clock, the hour set for the big clambake, the scattered frolickers began to round up at Paragon Park's Palm Garden. They were a ready and hungry bunch that sat down to the number of 210 at 7 long tables with appetites whetted for the toothsome shore dinner that awaited them. The Mayor of Boston and the high muck-a-mucks of the tour and club were at the speakers' table and a score of ladies with their escorts were at another. Three tables were conspicuously unfilled, but the wait for their occupants was not long. To a lively quickstep by the band a hundred roisterers marched, lock step, to their places at the tables, amid great cheering. On the head of each was a diminutive merry widow hat. This started the fun going, which continued fast and furious throughout the feast. The band played and a soloist sang popular airs, but the song hit of the dinner was parody choruses, written by W. W. Caldwell, which were sung with enthusiasm whenever the band gave the cue. Throughout the dinner there was that spontaneous jollity which left no doubt that all hands were heartily enjoying themselves with the generous hospitality supplied by their hosts.

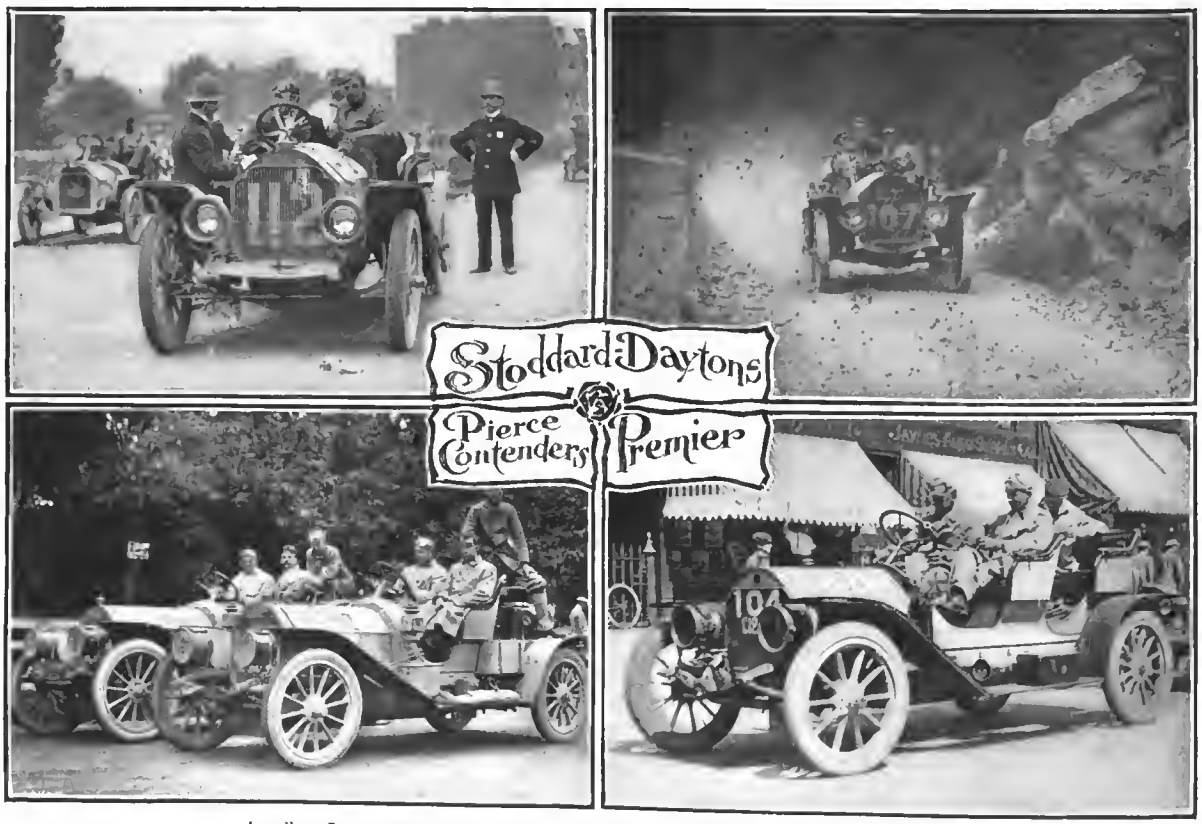
The clambake menu led off with steamed soft clams. Some of the inland motorists did not know that fingers were made before forks, but they soon learned and were as busy as any of the veteran shore diners. Then followed fish chowder, live broiled lobster, broiled spring chicken, chiffonade salads, ice cream, and all the "fixin's" that go with them. All were served piping hot by pretty white garbed waitresses, who with true Boston courtesy carefully looked after the requirements of the guests.

A hurrah of speech making wound up the dinner. They were all brief and to the point, took well, and were received uproariously. President Elliot C. Lee welcomed the tourists, and then gave way to Secretary Fortescue, who acted as toastmaster. Mayor Hibbard, of Boston, received an ovation. Chairman Hower, Vice-President Lewis R. Speare, and Charles J. Glidden followed. Even Mrs. Cuneo briefly replied to the cheers for her, wittily remarking that a woman always had the last word. There were loud cries for "Sunny Jim," to which rosy, rubicund Dai Lewis finally responded. A newspaper man handed out Boston and the club a jolly that met with a sincere echo, and then Chairman J. F. Hovestadt, of the entertainment committee, brought the speechmaking to an end.

After the bake the caravan scattered among the shows and wound up a most delightful day on the beach with a hurrah twice on the last boat back to town.

The Bay State Automobile Club's entertainment committee was made up of J. F. Hovestadt, chairman; Lewis R. Speare, C. R. Pierce, J. S. Hathaway, W. K. Farrington, G. W. McNear, Elliot C. Lee, H. W. Whipple, H. W Knights, J Fortescue, A. P. Underhill, and J. C. Kerrison.

J. C. W.



Leading Contenders for the Hower Trophy in the Fifth Annual A. A. A. Tour.

SCENIC BEAUTY ON NINTH DAY'S RUN IN THREE STATES

POLAND SPRINGS, ME., July 20.—All hands vote to-night's stop the most beautiful from a scenic standpoint of the tour to date. The Summit Hill Springs House is a comfortable, well-kept hostelry, built on top of a little mountain in the center of a broad valley. From the verandas one has spread out before him in all directions a glorious panorama of green fields, picturesque lakes, and thick woods bounded in the distance by mountains, and to the west by high peaks. The Westerners say it reminds them of Colorado toned down to peaceful greens and gentle outlines.

The Canada tour presented the novelty of foreign surroundings, but it did not compare with the present one for daily variety. Each day brings with it an almost complete change of environment. The journey of 154 miles began with a run across the Cambridge Bridge and then circled the Harvard University campus and buildings. The caravan then headed for the shore, passing through Revere, Lynn, and Swampscott. Next came Salem, the witch town, with its interesting old house and homes.

Just beyond Salisbury, the caravan entered New Hampshire, skirting the ocean at Hampton and Little Boar's Head. While rounding a point of the latter, several cars were halted by Captain William H. Jacques, a retired navy officer and engineer of repute, who insisted on offering the passengers the hospitable greeting of cigars and whiskey. The captain showed the Packard press car party through his beautiful colonial home with its collection of rare old family furniture.

Portsmouth, a quaint old whaling town, where peace between Japan and Russia was arranged, was also interesting for its old houses and other reminders of past glories as a seaport, though it is still of importance through its U. S. Navy yard.

Crossing the bridge at Portsmouth, Maine was entered. As the tourists advanced, the scenery took on a bit wilder aspect. From Portsmouth the route turned inland and climbed gradually over rolling grades until a final steep climb brought the caravan to its destination.

The schedule of 8 hours set for the run of 154 miles did not bother the cars at all, most of them beating it by nearly an hour. Another day passed without any penalization of the perfect score division. It looks more than ever like a bunch of Glidden and Hower ties at Saratoga with 4 clean slate teams in the former and 5 runabouts in the latter after 9 days of touring.

The tourists found fine macadam in Massachusetts, excellent gravel highways in New Hampshire, and clay loam roads in Maine, which are quite a come down. J. C. W.

ON THE NINTH DAY—FROM BOSTON TO POLAND SPRINGS

POLAND SPRINGS, ME., July 20.—With nine of the twelve running days of the tour over, four teams are still in the perfect score classification; as are five of the original fourteen Hower contestants and the two Glidden certificate cars. Not a single one of the contesting machines lost a point in the 154-mile run to-day from Boston to this summer resort in the foothills of the White mountains. Thanks to the good condition of the clay roads from Portland to this point, and to the 19.2 mile per hour schedule for the biggest car class and the 17.6 mile schedule for the smallest class, none of the cars had the slightest troubles during the day.

Not a little consternation pervades the broad corridors and spacious smoking and dining-rooms of Summit Hotel to-night over the possibility of a big run-off after the arrival at Saratoga, Thursday evening. With but three days running, and the road assurances as favorable as those of to-day, it is certain that at least three, and perhaps four of the Glidden teams, will be able to have the 1,000 points blazoned on their banners on arrival at Saratoga; there is no reason why an equal honor does not await the two Pierces, two Stoddard-Daytons, and one Premier in the Hower end of the duel; and it is equally certain that the two Stevens-Duryea machines will continue the reliable record that they have maintained since the departure from the starting point at Buffalo.

Altogether it looks to-night as if motoring in America is to receive the biggest boom of the decade, which it rightly merits, if four out of ten teams can land at Saratoga with perfect scores, and if, as at present, twenty-three of the original thirty Glidden aspirants, can reach the goal without a single black mark being debited to them.

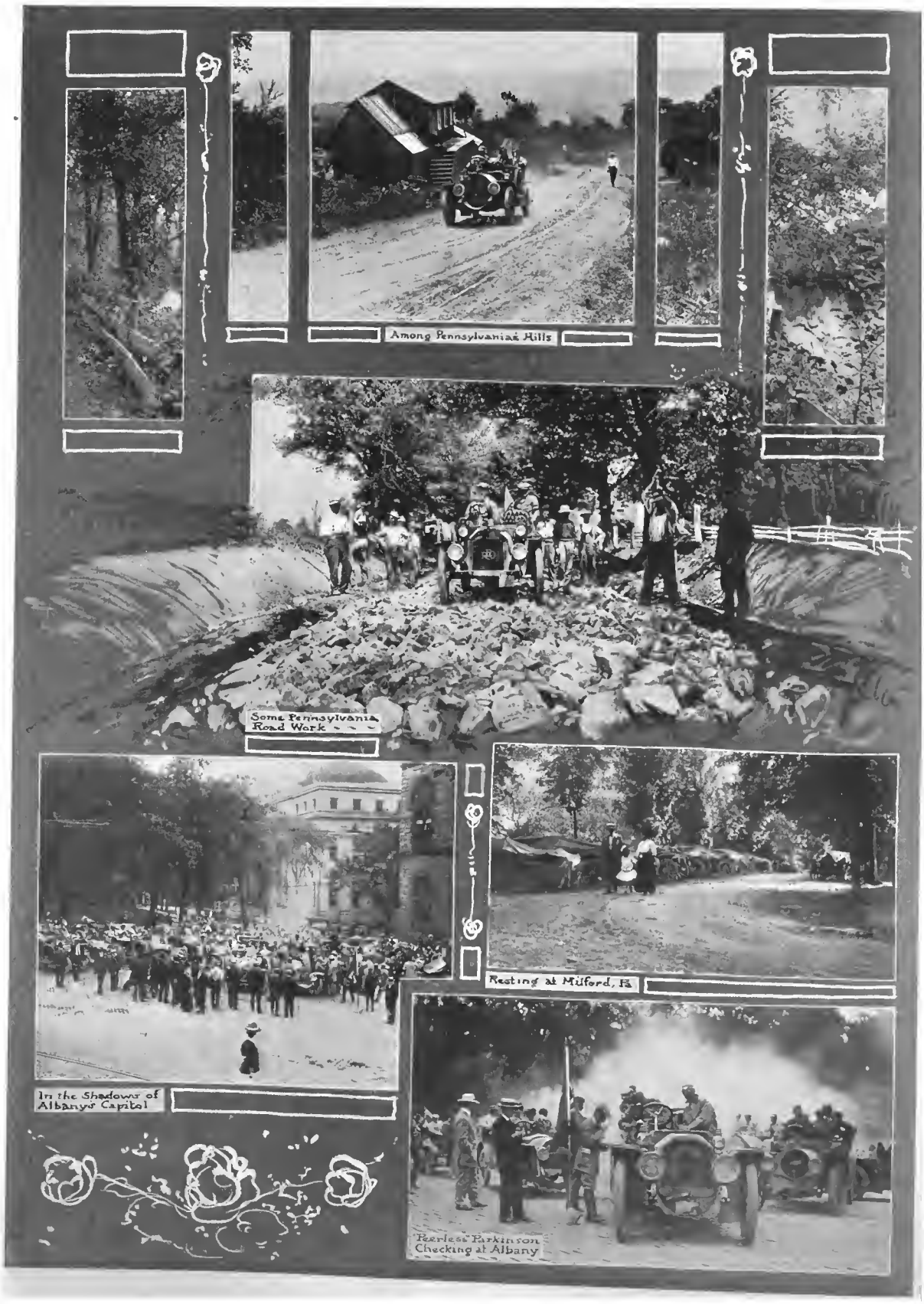
To-day was not without its incidents. M. S. Bates, driver of No. 14 Franklin touring car, narrowly escaped what might have proven a serious, if not fatal accident. Bates took or attempted to take a turn near Ipswich, 38 miles out of Boston, too fast.

A few apprehensions were floating around the corridors late in the afternon in the Premier ranks when Driver Preston with his one hundred century press car failed to report in with the other cars. All apprehensions were happily dissipated when later it was learned the car did not check out of Boston until 9 o'clock, and that when on the road it was playing a racing game with the Rapid truck, which carries No. 40 as its official cognomen. The Premier party ate dinner at Rye Beach, in sight and within hearing of the Atlantic billows, and enjoyed a real tour. Driver Preston, who, in the tourist phrase, has been beating it a little during the tour, to-day settled down to that phlegmatic pace which a car embarked on a century a day for a hundred days should pursue.

The Rapid truck, which has been daily covering the required schedule with its load of air bottles for inflating tires, has been receiving plaudits all along the line. To-day it got stranded by running out of gasoline and only the timely arrival of veteran Tom Fetch in his Packard press car saved it from a long wait by the roadside. Fetch did the good Samaritan act and brought the needed fuel.

The chairman's car was overtaken by the McGuire Pierce soon after leaving Portsmouth, 75 miles out of Boston, and close on the trail were Arthur Kumpf in No. 2 Pierce, Williams in No. 100 Pierce, Stevens-Duryea, Marmon, Mrs. Cuneo's Rainier, Thomas, No. 12 Franklin, and No. 10 Gaeth. These formed the advanced guard of the motoring caravan that started from Boston this morning, and after traversing New Hampshire, crossed a portion of Maine to this point.

Stevens-Duryea Contenders for Perfect Score Certificates.



TENTH DAY IN PINE TREE STATE—POLAND TO RANGELEY

RANGELEY, ME., July 22.—At the end of to-day's 141.7 miles run, through sand at the start and on mountains toward the finish, the number of perfect scores teams had been reduced from four to three, Marmon No. 22, driven by W. Clark, being penalized 8 points for being 8 minutes behind the 7 hour 20 minutes schedule for the route. There had been trouble with a brake which was, rather unwisely, temporarily instead of permanently adjusted and later required the removal of a wheel to remedy. Oakland No. 28 had 42 points added to its previous 7 points of penalization through tardiness, owing to the breaking of the front spring.

In the Marmon matter, H. H. Rice, who rode with Clark, put in a protest, claiming that the racemaking car did not maintain the time schedule throughout and that the Marmon was thus held back. The protest was not allowed.

With two days more to go, 22 contesting cars remain with perfect scores. The tour is the most convincing demonstration of the reliability of American cars that has yet been given, and all the more remarkable when the course and conditions of the test are considered.

The first dozen miles out of Poland the going was sandy and soft, but it improved when Lewiston was reached, and the beautiful fifty-mile run begun along the Kennebec river, through Augusta to Waterville, through which the 1906 tour passed en route to Rangeley. The caravan packed down the clay into broad ruts—which made the going quite smooth for the pursuers of the leaders. Shortly after leaving Madrid the upgrade climb began, and the country grew wilder. Picturesque lanes were passed, and there were splendid prospects of valleys and distant mountains from the hilltops looking back. Much of the going was through damp, cool woods until the Rangeley Lake House was reached. The cars were parked this time at the entrance to the hotel grounds. The 300 tourists put not only the hotels but the town's sleeping capacity to the test. Although the house was packed four to a room, fully one-third had to be roomed out in the village. J. C. W.

BAY STATE TEAM DROPS FROM THE PERFECT SCORE LIST

RANGELEY, ME., July 22.—No. 22 Marmon, driven by W. Clark, was penalized 8 points to-day, caused by a brake seizing when near Madrid, 18 miles from the night stop, the delay caused by the adjustment of the brake making the car ten minutes late in checking in. This car checked out at 7:50 this morning, 50 minutes after Chairman Hower's pacemaker left Poland. In spite of this lead, the Marmon, in company with several others, overtook the pacemaker at 77 miles and trailed him until the Marmon experienced its breakdown, when the car had 1 hour 25 minutes in which to finish the remaining 18 miles and repair the brake. The contention is made by the Marmon people, and is embodied in a protest to Chairman Hower, that it lost 15 minutes of its schedule trailing the pacemaker car from the 77-mile point, and because of this the entrant contends that the penalty should not be imposed.

The penalization of this car drops the Marmon team, entered under the colors of the Bay State Automobile Club, from the perfect score category, and leaves but three teams clean, namely: Pierce, Peerless, and combination Haynes and Oldsmobile.

One other car suffered penalty to-day. No. 28 Oakland, entered in team No. 2, Chicago Motor Club, lost 42 points, due to the breaking of a left spring when within four miles of Rangeley. The car was traveling fast and struck a treacherous road surface, with a covering of water and having a few deep ruts. The result was a complete break of the spring, which was repaired with fence rails and other procurables. The car checked in 44 minutes late. This car lost 7 points on the second day of the run, and now has a total debit of 49 points, which puts 16.3 debits against the club, cutting its credit to 983.6 marks.

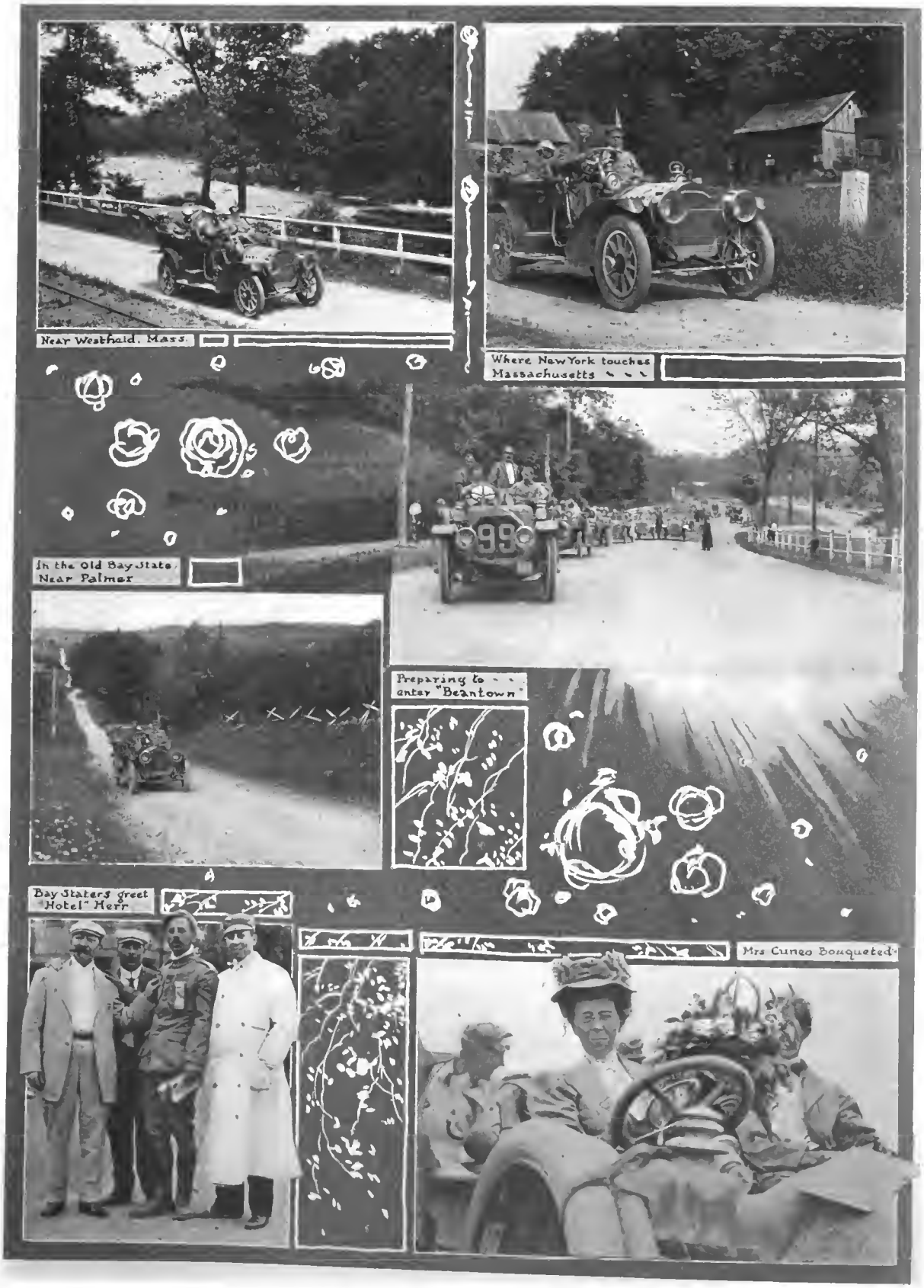
William Hurtburt, driving Garford No. 31, did some fast running during the first two hours out of Poland, covering 73 miles in this time. Later he had ignition troubles, but checked in to-night well ahead of time.

To-day's schedule of 141 miles in 7 hours 20 minutes gave an average of 19.1 miles per hour for the big cars and 18 miles per hour for the smallest Glidden contestant. The schedule was a very easy one. Complaints, however, are heard that the pacemaker set too fast a pace to-day through a few of the towns toward the end of the run and that while in the country districts he hit a very slow pace. It is natural to want to quicken over the good villa and town and city streets, because they are all cleared for action and waiting for the arrival of the Glidenites, but it is bad policy. The last half of to-day's run was a spectacular procession through the tortuous roads of the mountains. A dozen cars were in parade, separated from one another by but a few lengths. In this order they rollicked over the undulations of the narrow mountain roads and made a sight that brought cheers from the few spectators who sought the sides of the hills to watch the cars go by.

It is rumored here to-night that Chairman Hower may start to-morrow but 15 minutes before the first car to check out, the aim being to prevent the cars having an hour or more after their arrival at the night checking point in which to overhaul the machine and get it in the best of condition for the run of the following day. The rules governing the tour permit him to start at any time previous to the checking out time of the first car, and it is certain that should he desire he can check out but one minute ahead of the first car out and check in but one minute in advance of it. A pacemaking schedule of this nature would eliminate all possibility of making up time lost on the road for repairs other than tires and might result in the elimination of one or more of the three perfect score teams as well as of the 29 perfect score cars in the total contest.

Many are the complaints against this scheme, but there is no reason why it can't be done; in fact, it is allowed by rules. It is more and more being imprinted upon the officials that in a future Glidden tour penalties should be imposed for work done on a car. At present it is possible to break a frame and repair it and finish perfectly, and it is possible to break any part that a duplicate can be made by the driver and mechanic and yet finish without penalty. This is not fair. Consider cars A and B. Car A breaks spring leaf, crosspiece of the frame, two frame truss rods, and other parts. Car B has not a single break. Obviously B is the better car, but according to the present rules car A gets as clean a standing as car B does. This should not be.

The facts are definite to-day of the cause of Stoddard-Dayton No. 109 catching fire around the carbureter on the Pittsburg-Bedford run. It appears that this car has pressure feed for the gasoline and that in the gasoline tank is a standpipe rising from the base to within a short distance of the top. The pipe conducts the exhaust pressure to about the surface of the gasoline, so that it was vaporizing too readily in the carbureter, and when an explosion occurred in the carbureter it ignited the gasoline fumes around the motor. It was not short circuiting of the magneto that caused the fire. An order from the factory was received that this car be withdrawn, leaving only the two perfect score Stoddard-Daytons in the Hower struggle. D. B.



GOSSIP OF BIG TOUR AND THOSE PARTICIPATING THEREIN

A. A. A. Tourists May Hike West Next Year.—As is usually the case, the tour is hardly under way before the "rumor conunittee" begins to speculate and surmise as to where next year's tour will be. At times some unseen power constitutes this "bunch of loose talkers" a committee of the whole, so prevalent do the predictions about what is going to happen next year become. Gossip has it that in 1909, it will be Chicago's turn to act as the starting point, and for a time at least the roads east of the Mississippi will be abandoned, Denver being the goal of the 1909 Gliddenites. No one of the proposed routes that have ever been given creation in the seething gray matter of some of these before-handed thinkers, has served to arouse quite as much interest as this talk about getting into new country next year. Come to think of it, why not? The A. A. A. Reliability Tour is an American institution and there is nothing sectional in its character, and now that repeated transcontinental tours and political convention jogs have shown the feasibility of the project, there seems to be no good reason why the West should longer be neglected. The talk current about the project has even advanced to the stage of outlining the plans in detail. There will be no hustling for accommodations and no one can insist on having "one with a bath," for the caravan will travel circus style and erect its own tents at each night stop. There will likewise be the "grub wagon" and the other concomitants of a well-regulated commissary department. Evidently some one has been thinking hard on the subject. Whether the thoughts of the powers that be are along totally different lines, and the plan of giving the West a show is only a little of the superfluous rarified atmosphere of which there is always such a copious supply, remains to be seen.

Some Statistics of the Tour.—The following are a few of the statistics relative to the features of the forty-six cars contesting in the Glidden, Hower and Glidden certificate ranks:

Chain drive, 3; shaft drive, 43.
Four-cylinder, 32; six-cylinder, 9; two-cylinder, 5.
Water-cooled, 42; air-cooled, 4.
Friction transmission, 2; planetary transmission, 7.
Progressive sliding, 12; selective sliding, 25.
Jump spark ignition, 35; make-and-break ignition, 11.
Opposed motors, 3; vertical motors, 43.

The three Marmon cars competing are all of 1909 vintage, and carry four-cylinder motors, with 5 3-8 by 5 inch cylinders, the rating given out being 50 horsepower. The new rear axle made by the company is one of their features. It has the differential housing fitted with a circular plate at the rear through which the differential gears complete can be removed. The brakes are internal bronze, shoes faced with a fabric cover which are located side by side and expand within a 17-inch cast-steel drum 4 inches in width, so that each expanding shoe has a width of almost two inches. The adjustment of each set is by a screw which acts within a worm sector carried on the shaft that has the expanding cam on it. The double three-point suspension is retained, but modified in that the motor and gear-set are carried on a cradle, which at its front rests on the front springs and at its rear is trunnioned on a dropped crosspiece of the frame which carries the car body.

Around Historic Boston and Vicinity.—Packard Seventeen was a phrase coined during Sunday while a party of fourteen press representatives, at the request of E. Ralph Estep, publicity manager of the Packard company, was entertained in three Packard cars by being shown the points of historic interest around the Hub on a 100-mile jaunt. With Russel Huff, Tom Fetch, and Fred C. Graves of the Boston Packard agency as wheelmen, the run through Boston and suburbs was made. Crossing into Cambridge a glimpse of Harvard University was obtained; the route continued to Concord, where still stand the Emerson and Longfellow homes, and beyond were visited the battlegrounds where was lighted the match that culminated in the great Revolution. Every mile or so along the road are to be found tablets or monuments marking incidents in the war for independence; by the roadside stand houses erected previous to 1775 and in which figured episodes that are now links in the great chain of Revolution events; and in every town are monuments and parks consecrated to the memory of those who fought and died. From Concord the route led to Lexington. Circling at a ten mile radius west of Boston, the course embraced Salem, with its "House of Seven Gables"; Marblehead, with its old fortifications; Lynn, the home of the shoe industry; and Chelsea, that so recently was nearly entirely destroyed by fire. A stop was made at Bunker Hill monument.

Selden's Record Run to Bedford Springs.—Through the breaking of a front spring on the Selden entrant in the A. A. A. tour, competing under the colors of the Rochester Automobile Club, a record run was made over the 450 miles intervening between Rochester and Bedford Springs. The driver's wire for a new part was received too late to make a shipment by express, so George B. Selden, Jr., decided to deliver the part in his own car. With Driver Fred Wilson at the wheel and Superintendent John Siegel beside him, while Mr. Selden and Head Tester Charles Young occupied the tonneau, the party left Rochester at 1:20 Sunday morning. Cambridge Springs was reached 11 A.M. Sunday, and, after a heavy shower that made slow going, the party rolled into Pittsburg at 5 P.M. Here the Pittsburg Automobile Club supplied maps and a guide, and Bedford Springs was reached at 6:30 the next morning, only to find that the new spring could not be used without disqualifying the car. Temporary repairs were made with the aid of four nuts, but as they come under the head of "finished material" the Selden entrant lost its standing after all, but continued for a certificate and will go through to Saratoga.

SONGS OF THE A. A. A. TOUR.

(Tune, "School Days.")

Tour days, tour days,
Tough old Glidden tour days,
Schedules arranged by arithmetic,
Up to the hubs in the mud we stick.
Seventeen hundred miles or so
Gosh, how we made the old car go,
And didn't we take a header though
When we had a couple of skids.

(Tune, "Merrily We Roll Along.")

Merrily we eat the dust,
Eat the dust, eat the dust,
Merrily we eat the dust
'Cause Hower says we must,
'Cause Hower says we must, 'cause Hower says we must.

(Tune, "Oh, Mr. Dooley!")

Oh, Mrs. Cuneo, Oh, Mrs. Cuneo,
The greatest woman driver that we know,
She keeps a going; she makes a showing,
Does Mrs. Cuney-uney-uney-O.

(Tune, "I'm Afraid To Go Home After Dark.")

Listen here, Hower dear,
I'm afraid to check in after dark.
Ev'ry day the papers say
That a car hit a tree in the park.
I'm on the tour of the dear A. A. A.,
Trying to set the spark,
Oh, I wish I were home,
For I'm afraid to check in after dark.

(Tune, "The Garden of Love.")

Won't someone kindly tell me,
Won't Hower answer why
To me this tour's the limit,
I'll soon "cash in" and die.
Nine hundred points against me,
And I should like to know
Why they make a lemon of a car on these roads,
Where only the goats should go.

NATIONAL TOURS OF THE A. A. A. WHICH HAVE PRECEDED

1904: The first annual tour of the American Automobile Association, starting July 25, 1904, had as its objective point St. Louis, where the Louisiana Purchase Exposition was being held. Sixteen machines started from New York and joined themselves to eleven others from various New England towns. The ranks of the travelers were swelled by additions from all points, continuing by way of Albany, Utica, Syracuse, Rochester, Buffalo, Erie, Cleveland, Toledo, South Bend, Chicago, Pontiac (Ill.), Springfield (Ill.), to St. Louis. At the same time another portion of the tour was being run over the National Highway and through Columbus, Indianapolis and Terre Haute to the Exposition City, bringing the total number of participants to 108. Practically all the machines reached St. Louis, the tour being more of the nature of a combined run than a competition.

1905: Thirty-two automobiles competed in the 870-mile Association tour in 1905, the first contest for the Charles J. Glidden touring trophy. Starting from New York, the itinerary was through Hartford, Boston and Plymouth, N. H., to Bretton Woods, and returning by way of Concord, Worcester and Lenox, Mass., to New York. Percy P. Pierce was awarded the trophy. Others finishing with clean scores were Ezra H. Fitch (White), Ralph Coburn (Maxwell), S. B. Stevens (Darracq), and J. C. Kerrison (Cadillac).

No official observers were carried, the contestants as a whole observing the performance of the competing cars, and at the end of the tour voting for the three entrants whose cars, in their opinion, had made the best records. In addition, the Glidden Commission employed a formula which took price, equipment and general touring conditions into consideration in awarding the trophy. First-class certificates were given to twenty-two contestants who completed the tour and arrived at all night controls before the official closing time. Four second-class certificates were awarded to others who completed the tour, but failed to make one or more of the controls in time.

1906: The third annual Association tour in 1906 and the second competition for the Glidden trophy, was a 1200-mile run from Buffalo to Bretton Woods, N. H., by way of Utica, Saratoga, Elizabethtown, Lake Champlain, Montreal, Quebec, Jackman and Rangeley, Me. Forty-eight machines started, 13 secured perfect scores, 19 completed the journey with a greater or less number of penalizations, and 20 retired at various points on the journey. Of the six cars competing for the Deming trophy two obtained perfect scores and four were penalized. The trophy was awarded to C. W. Kelsey, driving a Maxwell.

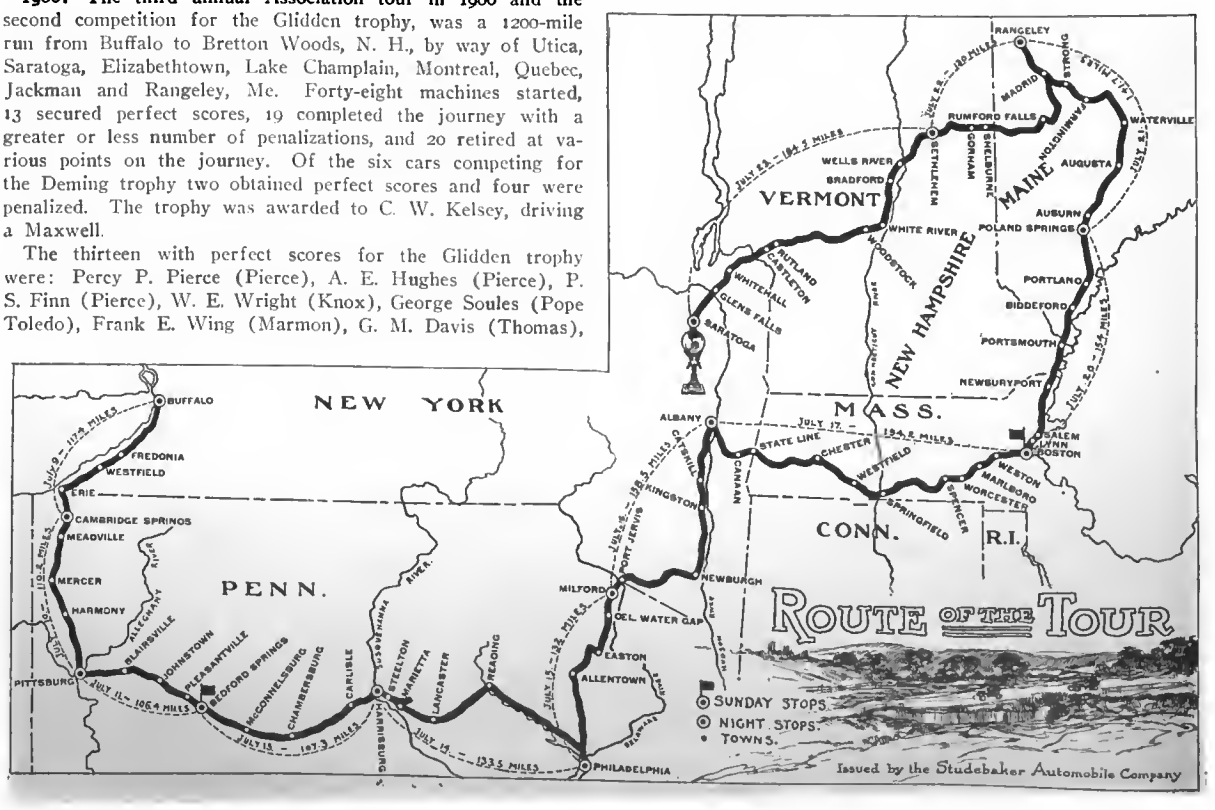
The thirteen with perfect scores for the Glidden trophy were: Percy P. Pierce (Pierce), A. E. Hughes (Pierce), P. S. Finn (Pierce), W. E. Wright (Knox), George Soules (Pope Toledo), Frank E. Wing (Marmon), G. M. Davis (Thomas), C. F. Barrett (Columbia), L. J. Petrie (Stearns), Charles Burnham (Peerless), W. C. Walker (Pope Hartford), Ernest Keeler (Oldsmobile), G. G. Buse (Packard). Since no winner had evolved and Percy Pierce was one of the perfect score performers, the trophy, according to the deed of gift, remained in the possession of the club which he represented.

1907: The route of the fourth annual A. A. A. tour was from Cleveland, O. (July 10), to Toledo, South Bend, Chicago, South Bend, Indianapolis, Columbus, Pittsburg, Bedford Springs, Baltimore, Philadelphia, New York (July 24). Distance, 1,570 miles. Forty-nine touring cars competed for the Glidden trophy, 12 runabouts entered for the Hower trophy contest, and 14 cars accompanied the tour on various services or as non-contestants. Both contests were run on a daily time schedule, with penalizations for replacements according to the catalogue value of the parts used. The Hower trophy was for individual car performance, the Glidden trophy for the best club showing, with certificates in addition for all cars finishing with a clean score. Clubs represented in New York, Cleveland, Chicago, Buffalo, Pittsburg, Detroit, A. C. A., and Westchester. The Buffalo team captured the Glidden trophy. Touring cars finishing with clean scores were Pierce (4), Thomas Flyer (2), White (2), Peerless (2), Packard, Haynes, Welch, Reo, Walter, Berliet, Royal, Tourist, Premier, American Mors.

A Stoddard-Dayton and a White steamer tied for the Hower trophy. On an additional test being imposed, the White proved the winner.

CHARLES H. DALE DIES SUDDENLY.

LARCHMONT N. Y., July 21.—Charles H. Dale, president of the Rubber Goods Manufacturing Company, and a director of the G & J, Morgan & Wright and Hartford Rubber Works Companies, succumbed suddenly to heart disease at his summer home here to-day. He was 56 and is survived by his mother and a widow and daughter.



GLIDDEN PLANS ORGANIZATION FOR AERIAL TRANSPORTATION

BOSTON, July 20.—Charles J. Glidden was in this city only a short time during the stop of the A. A. A. tour, one section of which is competing for a trophy donated by him, but he was here long enough to set things aeronautical going in a most vigorous way. Hardly had he left the city this morning with Chairman Hower than the announcement came out that at his request a leading firm of lawyers was drawing up incorporation papers for a concern to be known as the American Aerial Navigation Company to be created for the purpose of manufacturing and operating aerial devices and the establishing or aerial routes for the transportation of freight and passengers in the United States, Canada, and Mexico. The announcement says in part:

"Mr. Glidden anticipates that within the next eighteen months the new company will be carrying passengers and merchandise by the 'air-line' between New York and Boston—either by use of the dirigible balloon or aeroplane. He believes that with relay stations near Springfield and New Haven the trip can be made three hundred days in the year, the one from Boston to New York during daylight and from New York to Boston in seven or eight hours.

"The first experiments will be made with small dirigibles with a capacity of one or two passengers in addition to the operator. Stations will be established close to the street car lines on the outskirts of the cities, with suitable facilities to house the dirigibles and supply any loss of gas en route. An inexpensive plant to manufacture hydrogen gas will be in operation at each station. As the dirigibles will travel at an average height of 500 to 800 feet, very little loss of gas should take place. Pending the establishment of the air lines, and to familiarize people with aerial voyages, ascensions will be made from Pittsfield and North Adams in the spherical balloons. The parties interested in the new company hold options on a large manufacturing plant of aerial apparatus, and are in negotiation with parties for the manufacture of dirigibles.

"The form of dirigibles to be adopted will depend upon the success of the experiments now being carried on by the governments of the United States and France. 'Aerial travel,' says Mr. Glidden, 'will be, when thoroughly established, the cheapest and safest form of transportation.'"

It is significant in this connection that several years ago Mr. Glidden attempted to organize a balloon club in Boston long before any similar steps had been taken in other American cities.

POPE AFFAIRS BEING STRAIGHTENED OUT.

HARTFORD, CONN., July 20.—Application will be made to-morrow by George A. Yule and Albert L. Pope, receivers for the Pope Manufacturing Company, to Judge H. J. Curtis, sitting in the Superior Court, for the issuance of such orders as may be necessary for the continuance of the business for four months from August 28 next. They will also apply for an order for the transfer of certain assets from this State to New Jersey in order that another 25 per cent. dividend may be paid to the creditors. Vice-Chancellor Howell is credited with the statement that he thought the receivers would be able to pay off 75 per cent. of the approved claims within four months. This does not include the Unzicker claim, said to amount to $575,000, for the rental of certain factory premises in Chicago, and the status of which has not been definitely settled as yet.

The creditors' committee is circulating a letter calling attention to the petition to be presented by the receivers to Vice-Chancellor Howell at Newark, N. J., asking for instructions as to the continuance of the business. It is said that counsel for the stockholders has urged that $800,000 of the creditors' money be employed to continue the business for one year, contending that this could be done at a profit. This is strenuously opposed by the creditors' committee, on the ground that there is already in excess of $1,000,000 in hand, and that, whether it was conducted at a profit or not, the benefit would accrue to the stockholders, and not to the creditors. The latter are being advised not to sell their claims, as they will shortly be paid in full, with 6 per cent. interest.

BRITAIN'S FOUR-INCH RACE WELL ENTERED.

LONDON, July 18.—Britain's limited bore race, popularly known as the Four-inch race, will unite at least 35 competitors on the Isle of Man course Thursday, September 24. Continental Europe is represented by 14 cars and the home country by 21. As this is the first occasion on which England has held a pure speed event on the road since the Gordon Bennett race in Ireland, it is being watched with considerable interest, and is certain to unite a large gathering in Manxland during the last weeks of September. The list of cars engaged is as follows: Rover, 2; Hutton, 3; Arrol-Johnston, 3; Hillman-Coatelen, 2; S. C. A. T., 1; Vulcan, 1; Coventry-Humber, 1; Beeston-Humber, 2; Thorneycroft, 3; Calthorpe, 2; Deasey, 2; De Dion Bouton, 1; Darrac, 3; Metallurgique, 3; Berliet, 2; Vinot, 2; Westinghouse, 2.

STANDARD OIL WANTS ITS OIL USED.

INDIANAPOLIS, IND., July 21.—It is reported that the Standard Oil Company has decided it will control the oiling of roads and city streets in Indiana or that it must stop all together. In other words the company is alleged to have sent forth the word that unless Standard oil is used none will be used at all.

At Muncie, where extensive experiments have been made in street oiling this year, indications are that oiling will have to be stopped. So far oil has been purchased in the Muncie oil field at 99 cents a barrel, whereas the Standard Oil Company is demanding that its oil be used, which would have to be shipped to Muncie at $1.59 per barrel, f. o. b. cars in Kentucky.

Producers in the Muncie field say the Standard Oil Company has issued an ultimatum that it will no longer accept their product if they continue to sell to the retail trade, and incidentally to the men who have the oil sprinkling contract in Muncie.

WITHDRAWAL OF SANCTION CLEARS MATTERS.

PHILADELPHIA, July 20.—What promised to be somewhat of a racing muddle in Quaker city automobiling circles, has been averted by the prompt revocation of the sanction granted the Norristown Automobile Club for a meet to be held at the Point Breeze track next Saturday. The sanction was granted without the consent of Charles J. Swain, local representative of the American Automobile Association, and an ex-president of the Quaker City Motor Club, and has since been revoked on the ground that the Norristown club was attempting to go out of its territory to hold a meet. It is understood that the Quaker City club will hold another meet in August and a fall event in September, owing to the success which attended the last races at Point Breeze.

OHIOANS WANT TO USE AUTO TAX ON ROAD.

TOLEDO, OHIO, July 20.—A well concerted effort, at present headed by Col. Webb C. Hayes, is being made to utilize the income from the State automobile tax law in the erection and maintenance of an automobile road from Columbus to Lake Erie over the oldtime trail taken by General Harrison in 1815 during his memorable march during the second war with England.

The proposition is now in its early formation and if it meets with the approval of automobile clubs in the State and other automobilists, the State legislature will be importuned to use the income in this direction.

HOW 'TIS DONE IN PARIS.

By GEORGES DUPUY.

MY friend Norbert, who dines at the Avenue de la Grande Armée restaurant, is a dealer in second-hand automobiles. (I call him a dealer in automobile curiosities.)

Sad to say, that second-hand business of asthmatic motors, repainted bodies, and plastered tires, has gone to nothing on account of the quick manufacturing and reasonable prices of nowadays. The big "constructeurs" have driven the "nightingale agents" away from the Porte Maillot. But the cute, the clever ones still remain around and make a pretty decent living out of the combinations. My friend Norbert is one of those.

He was ordering the menu, and I had just unfolded my serviette, in front of him, the other day, at that Grande Armée place, where they all come, when a young messenger of the Postes et Télégraphes, his cap in his dirty little hands, remitted to him a telegram with five telegraphic orders for five thousand francs each. Norbert signed the blue slip with a gold-mounted fountain pen, gave a forty-sou piece to the little chap, and said to me, with that dreaming air of his, while reading aloud the message: "What do you say?—er—er. Tool box well received —two more 920-120—er—Madame delighted—Very well! What? —Oh!—that's a customer from Vichy, at whom I bombarded a 40-horsepower Liérich. A bird, I tell you! The blessed thing cost me an awful lot, garage, gasoline and all, since Easter. Now, mon cher, how about some of that 'navarin bourgeoise,' with a bottle of Chablis?"

The coffee was served, hot and a little foaming in the cups, when a long and slender young man, with an incredibly high collar which reminded of the Chinese stocks, extended to my friend, over the table, a military white-gloved hand and pronounced, with an angelic smile:

"'My dear Mr. Norbert, tell me, if you please; I have an offer for a 20-30 Bernault 1906, long chassis, landaulet by Schwalbacher, not used for five hundred kilometers. What do you think it is worth?"

"Don't know," said Norbert, gulping down his demi-tasse while talking. "It depends. At all events I can't positively consider anything just at present. I'm stuffed with a thousand bargains like yours. But I will let you have the American, if you want. How about fifteen louis?"

"Why, yes, that will do, my dear Mr. Norbert," replied the long, slim gentleman. "Send him along to-morrow morning at half-past nine."

"Are you going to tell me," said I, amused, "who on earth is that 'American' whom you 'let people have' for 300 francs?"

"My good man," said Norbert, with a comical emphasis, "first of all things, don't get excited. This world is great—and you have traveled little. The honorable gentleman in question—but here he comes! Look pleasant now. Hello, Frank!"

The man thus called approached. He was a handsome looking young fellow of about thirty; very "American" indeed in appearance and evidently clothed by the smartest tailer of Fifth avenue. Norbert introduced us.

"Mr. Frank McDermith, of Pittsburg: Monsieur Georges Durand, one of my good friends."

The American shook my hand cordially, and, bending his tall body over my shoulder, yet keeping the correct and rigid attitude of the well-educated men of the New World, he began muttering to Norbert, in the lowest, the commonest Parisian slang, a discourse, hardly translatable in any language.

"How is your sweet self, sir? Yes, sir ! We've got it. We've got the big brute for six 'notes.' I think it's pretty poor. What d'ye say? Twenty-five louis for my sweet self! Don't ask me if Julot, the old hoss, he was tickled to death when we took it away from him! Gee! A duck nobody wanted. She plays an awful tune of drum when you crank her, she kicks like a mule and consumes twenty liters of gasoline by the hour. Never mind! The crazy fool who handed the dough is happy."

"That's good," said Norbert, visibly indifferent to the abundant talking of the queer individual. "Now don't forget that you have an appointment with the viscount to-morrow morning at nine-thirty. I proposed fifteen louis."

"Right you are! I'll be there. See you to-morrow."

"Now come on!" said I to Norbert, laughing with him. "That fellow is certainly the greatest number I have seen for some time! And the beauty of it is that he is just as much of an American as Adolphe, the head waiter, might be!"

"How clever!" replied Norbert, ironically. "They can't keep anything from you! In fact, the gentleman's name is Désiré Desclevin. He is the son of Pierre Desclevin, an old joiner of the rue de Charonne, where my friend himself got born, some twenty-eight years ago. In our business the difficulty is not 'the sale.' A good man, who knows how to smell the wind, always sells easy enough. The main thing is to buy.

"For instance, the day before yesterday, I heard that the manager of 'Paris-Moteur' garage, a new establishment, had just received for sale, a big 50-horsepower landaulet de voyage Bannard 1907, about new, all accessories, and three rear Rouge ferré Continentals packed on the top. The proprietor of the car, obliged to leave immediately for Brazil, wanted 15,000 francs for it, a price already interesting to me, as I had a customer willing to pay 16,000 for the very same type, second-hand. But I wanted to get the limousine for 12,500. You understand? The intermediary would hear nothing of the kind, saying that he had received formal orders not to cut a sou on the bargain.

"I, however, made him sign an agreement by which he would allow me, his colleague, a commission of 500 francs if I'd bring him a buyer with the cash. You get that clear, don't you? Then, here is where my false American appears on the stage.

"I had, the night before, telephoned to the manager of 'Paris-Moteur' that I had found a customer, a rich foreigner, and that the gentleman and I would be at his garage the next day at 10 o'clock. Right after that first telephone message I sent for Désiré Desclevin, whom I hire all year long on an exclusive contract, told him in a few words of what was the matter and filled his beautiful morocco pocketbook with thirteen brand new thousand-franc bills, just drawn from the bank.

"I was at the garage on the minute. He, Désiré, arrived a good quarter of an hour late, in a taxicab, swell as the swellest New York clubman; clean shaved, brown hat, brown suit, low patent leather shoes, mauve silk tie and stockings. The manager, hat down, met him at the gate and led him to the big car, which they had washed and cleaned and polished all morning. Playing my part, I had already opened the door of the limousine to show 'Mr. McDermith' the inside equipment, but, without condescending to look at me, Desclevin said in a peremptory tone, and with the most perfect English accent:

"'Mer-ci, Messieus. I shall see for myself. I am not a beginner in the automobile. Will you please crank the motor?'

"He turned twice around the car, looked underneath, lifted the bonnet, stopped the engine by cutting off the current, like an old chauffeur, and rudely addressing the owner of the car—a young and dull-skinned hidalgo who was witnessing the scene with a supremely indifferent air, Desclevin said: 'Tell me the truth. You have traveled with this motor car over ten thousand miles?"

"The other swore by his ancestors that such were not the facts; but Désiré, without according him a glance, took out of his pocket and laid on the varnished mud guard of the limousine his thirteen thousand franc bills, saying with his same accent:

"'Voua-ci. Treize mill frones. You take that money or I will sign a check on the American Express, if you like it better. That is all what it is worth, Messieu. No—no use—inoutile! Don't make any gests nor raise your shoulders, or I shall see myself obliged to pocket my money again. This automobile he is the eighth I buy in my life, you know. This one he is for my mother, in the South. You know what my mother she pay in America, for one 40-horsepower like that? Bien! my mother she pay only twelve mill frones for one quite new.'

"Of course the blue notes of the Bank of France produced their irresistible effect, and my commission duly pocketed, I took out *for 12,500 francs*, the automobile sold to my customer, Mr. Frank C. W. McDermith, of Pittsburg, Pa., U. S. A."

FUTURE OF GRAND PRIX SEEMS TO BE IN DOUBT

PARIS, July 20.—In killing the Gordon Bennett and substituting therefore the French-cooked affair since known as the "Grand Prix de France" the French trade and the Automobile Club of France, which are closely intertwined in racing, bravely determined to grasp the bull by the horns and to dictate that all international racing held in France thenceforth should be *à la Française*. The French flavor was made so strong that nothing foreign was to be permitted to crop out. *Hélas*, it is next time to grasp the bull by the tail, for then it will not be so hard to let go when the animal stands for Italian or Teutonic superiority. France and Frenchman generally have been bitterly disappointed in the outcome of the carefully planned Grand Prix. Instead of being a mild and tractable animal that could be kept under the tricolor without difficulty, this creature permits itself to be robbed of all its honors by France's dearest enemies and becomes transformed into a white elephant, that she would like to kill but can't.

The outcome that was so generally predicted, once it became known that France had been utterly swamped on the Dieppe circuit, has already come to pass, for at the meeting of the Commission Sportive, held here to'day, a proposal to abandon the Grand Prix was broached by the Marquis de Dion and was supported by a number of his friends, but the preponderance of sentiment was against it, for defeat still rankles too strongly. Had it been any other nation but Germany, such a thing might have been possible on the ground of chance or accident, but there can be no sidestepping the avalanche under which the tricolor disappeared on July 7. The cry of "Let me out and I won't do it again," that comes from beneath the heap, is indicative of a renewal of the same sentiment that was responsible for the killing of the Gordon Bennett, except that now no choice remains but to attempt to retrieve the honors lost, or ignominiously retire. The "I don't want to play any more" faction has already come to the surface in to-day's meeting, and it is probable that if it had not been so strongly opposed, the obsequies over the Grand Prix would have already been a matter of history. The feeler thus advanced attracted too much attention to itself, however, and after an informal discussion, the project was tabled until the September meeting.

Growth of Prolonged Speed.

An interesting table is herewith given, showing the growth of prolonged speed for the last eight years in all the principal international events held in Europe and America:

Year.	Driver.	H.P.	Course.	Distance.	Average. Time. (Miles.)
		Gordon Bennett Race.			
1900	Charon	20	Paris-Lyons	310	9:09:00 37.5
1901	Giradot	40	Paris-Bordeaux.	344	8:51:50 36.9
1902	S. F. Edge	40	Paris-Innsbruck.	366	10:41:58 34.1
1903	Jenatzy	60	Ireland	367	6:39:00 55.5
1904	Thery	75	Taunus, Germany	347	5:50:08 59.6
1905	Thery	90	Auvergne	310	7:02:42 48.6
		Florio Cup.			
1905	Raggio	120	Brescia	312	4:46:47 65.2
		Ardennes Circuit.			
1905	Hemery	90	Ardennes	372	5.58:32 61.82
1906	Duray	130	Ardennes	372	5:38:39 63.36
		Vanderbilt Cup.			
1904	Heath	90	Long Island	284.4	5:26:45 52.2
1905	Hemery	90	Long Island	283	4:36:08 61.49
1906	Wagner	120	Long Island	283	4:50:10 61.43
		Grand Prix.			
1906	Szisz	100	Sarthe circuit	769	12:14:07 63
1907	Nazzaro	120	Dieppe circuit	478.4	6:46:33 70.61
1908	Lautunschlager	120	Dieppe circuit	478.4	6:55:43 69

Labor-saving Devices Used in Grand Prix.

No better proof of the keenness of the contest for the Grand Prix could be found than in the manner in which the tire and gasoline stations—the ravitaillement, as it is called here—had been fitted up. With a few exceptions by firms having little chance of winning the race, whatever help they were given from the outside, there were more labor-saving devices and more elaborate organization here than ever befor.

The old method of handing up gasoline in large tin cans, the bottoms of which were punched in to facilitate emptying was abandoned as far too slow. Panhard, Mercedes, Dietrich, Bayard-Clement, and one or two others had all their gasoline under pressure in a large tank in the ravitaillement pit. A long, flexible tube led from the tank to the cars and allowed filling in but a fraction of the time usually employed.

It was interesting to compare this up-to-date method with the slower ones. Emile Stricker, for instance, the Yankee driver of the Porthos six-cylinder, ran to his stand and yelled for gasoline. It was handed up in large, open-mouthed milk cans; when all that was available had been given the tank of the racer was only half filled, and poor Stricker stamped and bit his fingers in rage as he waited for the small cans to be handed up to him. A similar delay happened to Henry Fournier, which so enraged him that he started up the car for its last lap before the mechanic had got into his seat. The bewildered Italian would doubtless have been left behind had not Fournier leaned out while the car was in motion, seized him by the collar and bodily jerked him into the car. Before the mechanic had recovered his equilibrium Fournier had got into his fourth speed.

There were greater facilities than ever for speed in the changing of tires, though as a matter of fact the performances were not always of the best. Ordinary jacks were not used except on a small proportion of the cars. Panhard and Fiat, among others, had large pneumatic jacks made to fit under the rear axle and raise the rear of the car with two or three turns of a handle. To raise the car was the work of a second and a half; to lower it did not occupy more than a second. Dietrich had a large jack made to fit under the rear axle and provided with two levers about seven feet long. With the driver at one lever and the mechanic at the other, the vehicle was raised from the ground with one simple downward stroke.

Water and lubricating oil were handed up to the drivers in the old-fashioned way, the former in open-mouthed cans and the latter in the metal cases usually supplied by the makers. With the exception of the British Austin cars it was remarked that the racers very rarely took on water.

Spare parts were stocked in abundance. Caskets, spark plugs, nuts, bolts, magnetos, and even radiators, cylinders, pistons and piston rings, sprockets and gears were laid out in perfect order ready to be handed up if the call came for them. But the call never did come, for, with the exception of Erle, who changed a radiator at the second station, the repairs were slight, the cars either being put out of the race in a very damaged condition or through tire and wheel accidents.

Methods of preparing the cars varied with the different drivers. The Itala cars carried a cylindrical gasoline tank behind the driver's seat, of such a size that the inflated tires formed a ring around them. The Weigel cars had a similar arrangement, with the addition of basket work at the base and around the tank in order to diminish the vibration. On the Porthos the gasoline tank was behind the seats and to the rear of this a round tank without a lid, made of the exact size to allow tires to be put around it, while the interior could be used for carrying the pack or any tools most likely to be needed on the race. Each of the cars in this team had also a spare magneto carried on suitable brackets within the frame. As an independent timer was employed a change of magneto could be made just as quickly as the changing of a plug.

The road having been considerably loosened by the speedy voiturettes of the preceding day, flying stones were to be feared. As a protection, the Weigel and the Itala cars carried a fine gauze screen attached to the right hand side of his dashboard in order to protect his face from stones thrown up by a car

ahead. The same driver had his little joke in the form of an enamel plate attached to the side of the car reading, "Dangerous to lean out."

The tarred surface was feared by most of the drivers, who wore not only ordinary goggles, but complete masks, making them altogether indistinguishable at a distance of a few yards. In addition a thick layer of cold cream or other ointment lay under most of the masks. Strang stuck to the ordinary type of goggle; his mechanic, Guichard, who did the same, lost his pair while jumping off the car, and no others being available for the moment, had to make a round with his eyes unprotected.

Several interesting facts appear in the table of the ten fastest laps given below. In the first place, of the nine cars which figure therein, only two finished, Hemery and Rigal. Not one of the speedy Brasiers completed the course. Salzer and Szisz retired in the third round, and Nazzaro and Wagner in the fourth. Credit should be given Rigal and Bayard for their spurt in the eighth lap, which enabled them to slip into fourth place at the finish. It may also be noted that eight of the fastest times were made on the first round; the speed with which they started off brought many of the drivers to grief.

Finished.	Car.	Nation.	Driver.	Time M.S.	Av'gs M.P.H.	Lap.
0.	Mercedes	German..	Salzer	36:31	78.5	1st
0.	Brasler	French...	Bablot	36:40	78.2	1st
0.	Brasler	French...	Baras	36:45	78.0	3d
0.	Braslsr	French...	Thery	37:08	77.3	1st
0.	Rsnault	French...	Szisz	37:06	77.3	1st
0.	F. I. A. T.....	Itallan...	Wagner ...	37:13	77.0	1st
4.	Bayard-Clement	French...	Rlgal	37:28	76.7	8th
0.	Braslsr	French...	Baras	37:44	76.0	1st
0.	F. I. A. T.....	Itallan...	Nazzaro ..	37:48	75.9	1st
2.	Benz	German..	Hemery ...	37:55	75.6	1st

Length of one lap, 47.8 miles.

The world's record for prolonged speed on closed circuits still belongs to Nazzaro, with 70.61 miles an hour attained last year at Dieppe. Though this year's cars were faster than those of 1907, as shown by the breaking of the record for one round by no fewer than eleven cars, the average for the total distance fell below that of a year ago by reason of tire trouble, partly caused by the state of the road and partly by the use of a new rim. Salzer, who has the record for one round with a Mercedes car, attained a speed of 78.5 miles for a distance of 47.8 miles, standing start. Last year the best time made by Nazzaro on one round worked out at the rate of 75 miles an hour, flying start. Herewith is the race average of the finishing twenty-three cars:

Speed Records of Grand Prix.

Pos.	Car.	Nation.	Driver.	Time.	Av'ge.
1.	Mercedes.....	German..	Lautenschlager...	6:55:43	68.9
2.	Bsnz	German..	Hemsry	7:04:24	67.4
3.	Benz	German..	Hanrlot	7:05:13	67.4
4.	Bayard-Clement	French...	Rlgal	7:30:86	63.8
5.	Mercedes.....	German..	Poegge	7:32:31	63.4
6.	Opel	German..	Joerns	7:39:40	62.4
7.	Benz	Gsrman..	Erle	7:43:21	81.9
8.	Renault	French...	Dlmltrlewltch ...	7:54:12	60.4
9.	Panhard	French...	Heath	7:55:86	80.3
10.	Germain	Belgian...	Psrpere	7:59:07	59.8
11.	Itala	Italian....	Cagno	8:07:56	58.6
12.	Bayard-Clement	French...	Gabriel	8:11:44	58.3
13.	Motobloc	French...	Courtade	8:12:43	58.2
14.	Motobloc	French...	Garcet	8:19:58	57.4
15.	Renault	French...	Callois	8:19:57	57.4
16.	Mors	French...	Jenatzy	8:24:44	57.1
17.	Mors	French...	Jarrott	8:39:20	55.2
18.	Auetln	English..	Moore-Brabazan..	8:42:50	54.5
19.	Auetln	Englisb..	Resta	8:48:50	54.4
20.	Itala	Italian....	Fournier	8:47:20	54.4
21.	Opel	German..	Opel	9:08:11	52.2
22.	Germain	Belgian...	Degrais	9:13:34	51.8
23.	Panhard	French...	Farman	9:24:40	51.0

THOMAS STILL SURE OF WINNING ROUND THE WORLD RACE

BY arriving in St. Petersburg first, which city, according to cable advices to the New York *Times*, the Protos car reached on Monday evening, the Germans have been enabled to win the second prize of $1,000 offered by the Imperial Russian Automobile Club. The definite position of the Thomas car was not known at the time, but according to Lieutenant Koeppen, it had reached Nijni Novgorod, about two days behind the German car. This would not appear to be correct, however, as when last reported the Americans and the Thomas were at Viatka, and Schuster was vainly endeavoring to locate a replacement part that had been lost in transportation somewhere along the line of the Siberian railway. Viatka is on the direct line to St. Petersburg, while Nijni Novgorod is 200 or 300 miles due south on the line to Moscow, which the Germans followed, so that it is unlikely that Schuster would run this distance unnecessarily, merely to look up a replacement part.

Thomas Has Thirty Days' Leeway.

Whether the Protos leads the way into Paris or not will not affect the position of the Thomas, provided the latter arrives there within thirty days of its rival, this being the allowance accorded it for its useless trip to Alaska and principally on account of the fact that the German car was shipped from Pocatello, Idaho, to Seattle, in order to reach Vladivostok in time to start with the others. Had the Protos been compelled to make the trip overland to San Francisco, then to Seattle and thence to Asia, as did the other competitors, it would have been months behind, as it had seriously broken down three times in succession just prior to being shipped to Seattle for repairs.

The arrival of the Thomas at Viatka, July 15, marked the close of the second one of those unfortunate occurrences that have served to delay the car so much during its Siberian trip. Shortly after leaving Ekaterinburg, on July 7, the boundary line between Europe and Siberia was crossed, but long before reaching that point one of the gears had succumbed to the terrific strain of the rain-soaked clay roads. It was temporarily repaired, 30 miles from Obansk, in Siberia, making further progress possible. Perm, in European Russia, was reached July 8, in a driving rain, with the roads in a worse condition than ever. Miller advised waiting as the crudely repaired gear would not stand the ruts and holes that racked the car so fearfully. Schuster determined to go on, however, and this proved his undoing, as the gear gave way again, but even in that condition the car managed to make the 15 miles intervening between it and Viatka without further mishap.

Accidents and Delays Have Been Numerous.

Ever since the accident caused by bumping over unballasted ties on the Siberian railway in the early stages of the journey, which placed the Thomas car five days behind, the Americans have met with a series of misfortunes. All but two days of this had been made by the time the Thomas reached Chita on June 19. Upon arriving at Lake Baikal the Thomas all but caught its German rival, just missing the boat which carried the former across. As a result, there was no gasoline to be had, causing a further delay of nine hours. On June 23 the Thomas was but 100 miles behind, and four days later it caught the Protos at Tomsk, but the ferryboat sunk with the American car, again permitting the Germans to get ahead. But by strenuous effort the Americans once more pushed to the front and July 1 were leading the Protos by a day. Both competitors left the main line of the railway, striking north to Ekaterinburg to the same pass through the Ural range. The Thomas kept on its northerly course through Perm, while the Germans went south through Kasan and Moscow, thus covering a much greater distance in reaching St. Petersburg than would have been necessary by the route taken by Schuster, so that if it had not been for the unfortunate accident to the gear and the delay caused by the loss of the replacement part in transit, the Thomas would have led its rival into the Russian capital by a good margin.

After a silence of more than a fortnight the Zust has been heard of at Krasnojarsk, which is the first report received from the Italians since July 1. It has been meeting with misfortunes and still has 5,600 miles to cover to Paris.

INCREASED EFFICIENCY OF SINGLE MOTOR DRIVE*

By A. L. DIXON, Member Society of Automobile Engineers.

SINCE the introduction, this season, of the single motor drive for heavy commercial trucks, considerable comment has arisen as to the practicability of this type compared with the double motor drive. In adopting the single motor the first advantage gained is decrease in weight, lighter battery, simpler control with a corresponding increase in number of parts thus decreasing the electrical troubles about one-third.

While the above points appeal very strongly to the owner of a power wagon, let us consider its performance from the technical point of view.

Comparing the two types separately we have:

Results of Double Motor Drive.

Weight light—11,610 pounds.

Motor—General Electric Company, 2, 30 amperes at 85 volts, 800 r.p.m.

Battery—Exide, 44 cells, 19 plates, 63 amperes for 4 hours.

Controller—General Electric Company continuous torque, 5 speeds forward, 2 reverse.

Double gear reduction, 13.33 to 1.

Tires—Firestone, front, 36x7 inches; rear, twin, 36x4 inches.

Chain—First red., Morse; second red., Diamond roller.

Bearings—Timken roller on countershaft and wheels; Hess-Bright on motors.

Performance on level asphalt:

Volts.	Amps.	Watts.	Speed	Weight Loaded	Watts. per Ton Mile	D. B. P. Per Ton
85.5	59.7	5,100	6.54	10.95	71.2	24.5

Curve No. 1 shows the performance of the two motor drives.

Showing of Single Motor Drive.

Weight light—9,505 pounds.

Motor—General Electric Company, 40 amperes at 85 volts, 1,200 r.p.m.

Battery—Exide, 44 cells 15 plates, 49 amperes for 4 hours.

Controller—General Electric Company continuous torque; 4 speeds ahead and 2 reverse.

Double gear reduction, 15.23 to 1.

Firestone tires—Front, 36x7 inches; rear, twin, 36x2 inches.

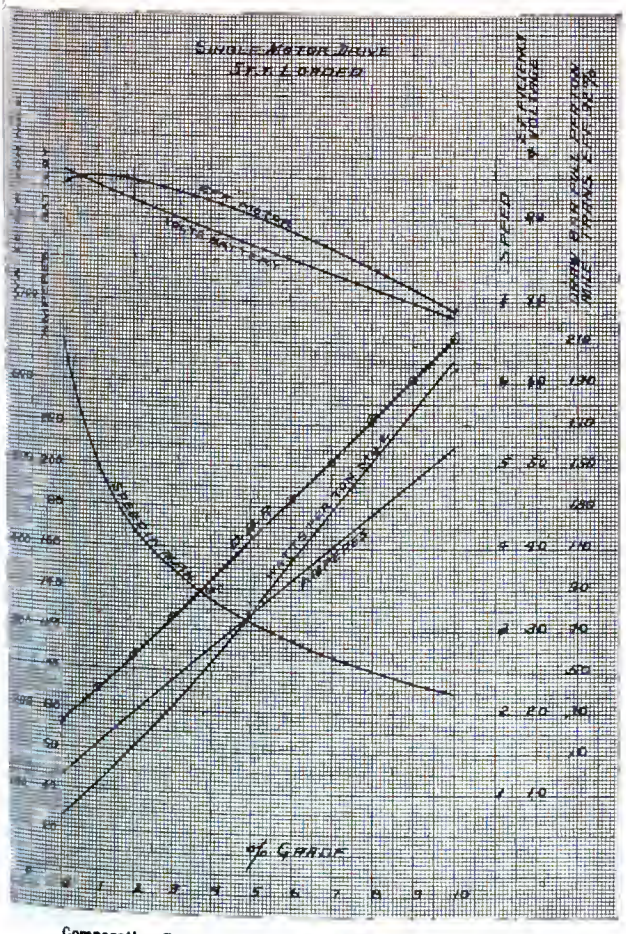
Chain—First red., Morse; second red., Diamond roller.

Performance on level asphalt:

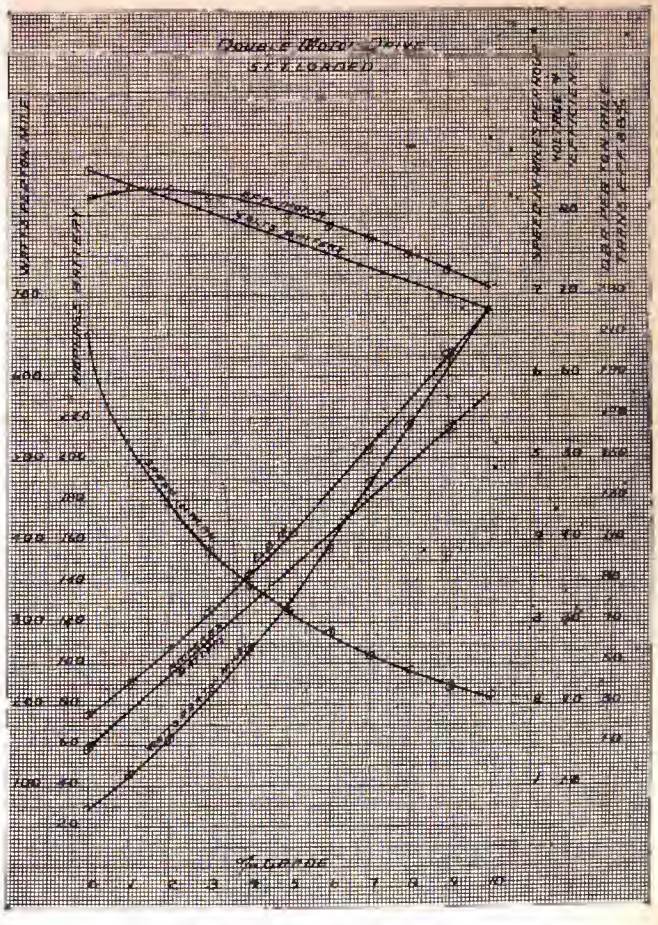
Volts.	Amps.	Watts.	Speed	Weight Loaded	Watts. per Ton Mile	D. B. P. Per Ton
85.5	46.8	3,990	6.50	9.865	62.3	22.3

Curve No. 2 shows the performance of the single motor drive.

*Paper read before the Society of Automobile Engineers on the occasion of the third annual summer meeting at Detroit.



Comparative Performance of Single Electric Motor Drive.



Results Shown by Double Motor Drive.

SINGLE MOTOR DRIVE—FIVE TON TRUCK.

Per Cent. Grade	Volts Battery	Amps. Battery	Total Watts.	Speed M.P.H.	Weight in Tons	Watts. Per Ton	Motor Efficiency	D.B.P. Per Ton at 92% Trans.
0	85.5	46.8	3,990	6.50	9.865	62.3	84	22.3
1	84	62.5	5,260	5	9.865	106.5	85	39
2	82.2	79	6,500	4.2	9.865	157	84.5	50
3	80.2	95.2	7,640	3.7	9.865	209.5	83.8	75
4	78.5	111.5	8,760	3.4	9.865	261	82.2	98.2
5	76.7	127.5	9,700	3.1	9.865	320	80.7	116.2
6	75	145	10,880	2.9	9.865	380	78	133.5
7	72.2	160	11,720	2.7	9.865	437	77.5	152.8
8	71.5	176	12,580	2.54	9.865	502	75.5	172
9	69.7	193	13,430	2.4	9.865	568	73.5	191.5
10	68	209	14,220	2.2	9.865	612	72	223

DOUBLE MOTOR DRIVE—FIVE TON TRUCK.

Per Cent. Grade	Volts. Battery	Amps. Battery	Total Watts.	Speed N.P.H.	Weight in Tons	Watts. Per Ton Miles	Motor Efficiency	D.B.P. Per Ton at 88% Trans.
0	85.5	59.7	5,100	6.54	10.95	71.2	82	24.5
1	84	76.5	6,430	5.16	10.95	113.8	83.4	40.3
2	82.2	93.8	7,700	4.48	10.95	156.8	83	57.2
3	80.7	111	8,960	3.88	10.95	211	82	75
4	78	128	10,000	3.43	10.95	266	81.5	103.7
5	77.3	145	11,200	3.11	10.95	329	80	120
6	75.6	162	12,220	2.8	10.95	390	78.5	133.8
7	73.8	178	13,230	2.58	10.95	468	77	154
8	72.3	196	14,180	2.41	10.95	538	75	177
9	70.6	213	15,020	2.22	10.95	618	73	200.3
10	68	232	15,780	2.11	10.95	686	71	223

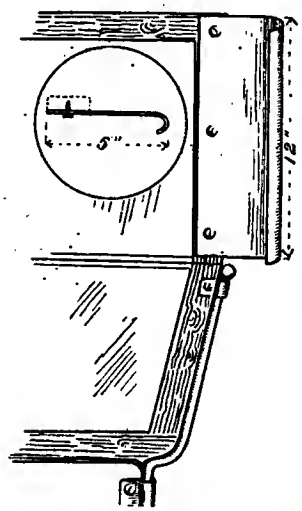
From the above data it will be seen that by using a 15-plate battery with a capacity of 196 ampere hours on the single motor drive, it is possible to get the same mileage as from the double motor using a 19-plate battery of 252 ampere hours. Or with the single motor drive with a 19-plate battery, the mileage would be increased 14 per cent. over the double motor drive. The above article is based on tests made of regular stock cars manufactured by the General Vehicle Company.

HOW AN AUTOMOBILE MAY RUN WILD.

A runaway motor car under ordinary circumstances can only take place on a steep declivity, too steep, in fact, for the brakes, when the driver is on board, but that it is possible for a car to get away "on its own" and "run amuck" amongst the traffic has been shown to be possible on several occasions, and two cases were recorded last week, writes Henry Sturmey, in *Motor* (London). In one case, which occurred in Ireland, the car was left standing, with the engine running, and by some means or other the brake lever, which also released the clutch, got out of its notch, with the result that the clutch went in and the car started, though happily no very extensive damage was done. In the other case, a motorist left his 60-horsepower car in garage and inadvertently left the clutch in. When he came to use his car again, he started his engine on the switch before getting into the car, and the vehicle promptly made a bee line for the door, which it smashed and, passing through, crossed the road and brought up against a wall on the other side, much to the detriment of radiator and lamps, as can well be imagined. These instances, although not frequent, can scarcely be said to be rarities, and it will be seen that they are due to the fact that, in the generally accepted system of car construction to-day, the normal position of the clutch is in engagement, and it is only out of engagement when the driver has taken the needful steps to remove it from that position. Were matters reversed and the normal position of the clutch arranged to be out of engagement with the engine, with which it could only be connected by a deliberate and intentional action on the part of the driver, such occurrences as those above related could not take place. There is no particular difficulty about it, because there are cars which are so constructed, but the general practice is the other way, and, as these incidents show, it contains a fair amount of potential possibility of danger, as there will always be drivers who are not as careful as they should be.

ELIMINATING BACK DRAFTS FROM A WIND SHIELD

THE appended illustration shows a device which an English autoist has adopted in connection with a wind screen, which is a great improvement, says *Motor* (London). As will be seen, it consists in the fitting of what may be termed a side wing with a returned edge, thus increasing the total width and widening the path made by the car through the air, so that the return inrush of air to fill the vacuum commences at a point a little further back and more outwards than usual, thus, to a certain extent, missing the occupants of the car with the air currents. Upon the question of wind screens generally the writer says: I was out with a friend one day in his car, and, as we were running rather fast down a hill, a small boy threw a stone at us. The boy was not very large, and his power of throwing could not have been very great, but the speed at which the car was traveling gave such an impetus to the stone that it passed completely through the hard felt hat that my friend was wearing at the time, and, luckily, did no more damage than to the hat. I remember at the time making up my mind that I would never ride behind a wind screen of glass, as, had we had one that day, it might have meant blindness for one of us. However, after motoring constantly through all weathers, I found myself face to face with the choice of having to use a wind screen or of having to give up motoring altogether, as the rush of wind affected my eyes rather badly. I tried goggles—half a dozen pairs at least—but I found them horribly uncomfortable, so gave them up, and at last went in for a screen. The screen that I am using has the lower half inclined toward the driver, the upper half vertical and adjustable. At first I experienced a good deal of discomfort from the back draft, but now I have overcome this, practically entirely, by adding a couple of side wings to the upper half of the screen. The wings are made of stout brass, of the same length as the upper half of the screen; width about 5 inches and slightly curved forward as shown in the section. I made these myself, making a template first in cardboard. I bent the plates over a broomstick with a rawhide mallet, and countersunk the holes for the screw-heads; the entire cost for the pair, including nickel-plating to match the rest of the metal work on the car, was only a few dollars. So much for this idea. Recently, coming home from Birmingham, we were passing through Merstham, when a small boy picked up a stone with the intention of throwing it at the car. I yelled at him and frightened him into dropping the stone, but, remembering my other experience, I am beginning to feel nervous about that glass screen again. I have seen screens made of glass in which is embedded some fine wire netting. This strikes me as being a good idea, as the netting would hold the fragments together. But why is the lower half of a wind screen made of glass at all?



Improving a Glass Wind Shield.

PRACTICE OF BRAKING WITH THE MOTOR*

By F. N. EUNTL

MUCH has been written concerning the advantages and the disadvantages of braking with the motor. Abroad, and in England particularly, the question has been the cause of raising an extended discussion. The detractors of this mode of braking or imposing the function of a retarding agent upon the motor, claim that it subjects that essential, as well as every element of the transmission, to an excessive strain. Certain it is, that those who doubt the efficacy of those parts should not place their confidence in anything but the friction brakes. Frequently, however, the *theoretical truth* of the matter is to be found among the extreme opinions of both the *pro* and *con* supporters of the argument, but in our opinion, the *practical truth* favors the upholders of the *pro* end, and here is why.

If it be true that the motor and the essentials of the transmission will succumb to the additional strain imposed upon them by utilizing the retarding action of the motor to reduce the speed of the car, instead of resorting to the use of the friction brakes in every instance, they must indeed prove defective in some respect, as the foot-pounds value of that strain is a minimum compared to what the same parts are subjected to under normal conditions of traveling, when the motor is propelling and not retarding. We shall see further that the maximum braking power which can possibly be applied in this manner at the rim of the driving wheel, is only equivalent to 85 per cent. of the power ordinarily delivered by the motor and measured at the end of its crankshaft, when running at normal speed. If the braking effort were measured at the crankshaft of the motor itself, it would not amount to more than 65 per cent. of the power of the motor, the difference between the two figures in question arising from the resistance due to the various parts of the transmission system. In braking, these resistances must be added, but in traveling they must unfortunately be deducted.

But to come back to the subject of braking with the motor, the strain imposed upon the transmission is insignificant as regards the differential, its pinions, the bevels, the driving chains, where they are employed, and the pneumatics; it is insignificant beside the enormous and harmful strains to which these same organs are subjected upon the slightest extra pressure on the pedal commanding the differential brake. Motor braking is a progressive operation; elastic in a word, and that is what militates so strongly in its favor. On a long descent, the motor will prevent the car from gathering speed, if it is compelled to run very rapidly by engaging the gears of the first or second speed. The following experiments show the extent of the retarding power that is to be expected of a motor when acting as a brake. They are the results of the investigations of W. Watson, of the *Automotor Journal*, and permit of determining this value in an exact manner.

A single-cylinder motor of 88 mm. bore by 101 mm. stroke, having a mechanically operated inlet valve, was connected to a dynamo through the medium of a belt, and the energy thus produced was recorded. The diagrams, Figs. 1 to 8, were obtained with the aid of a manograph. The first shows the pressures developed during the functioning of the motor at 1,000 r. p. m. as a producer of energy, and shows an output of 5.94 horsepower. As a preliminary to testing the power absorbed by the motor as a brake, the resistances produced by the electric motor were first calculated and set forth in such a manner as not to conflict with those proceeding from the gasoline motor alone when acting as a brake. All the trials were made at a speed of 590 r. p. m., the motor being at a temperature of 50 Centigrade. The frictional resistances alone, measured after lifting the valves out, amounted to 0.75 horsepower. The valves were then replaced and the admission valve held completely open, the total resistance then amounting to 1.03 horsepower, or .28 horsepower for the operations of aspiration, compression and exhaust, the third part of the cycle having a negative value. Upon closing the inlet valve, the total resistance increased to 1.22 horsepower, or .47 horsepower absorbed by internal work, the resistances due to friction being deducted. See Fig. 3.

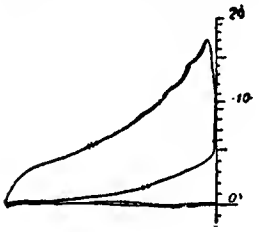


Fig. 1.

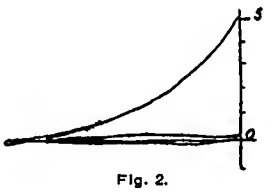


Fig. 2.


Fig. 3.


Fig. 4.


Fig. 5.

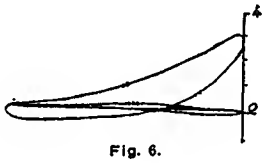


Fig. 6.

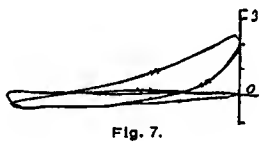


Fig. 7.

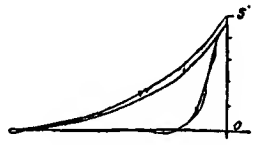


Fig. 8.

On holding the exhaust valve, the diagram, Fig. 8, was obtained, the motor then functioning as a compressor and providing a resistance amounting to 1.60 horsepower. If the exhaust valve is caused to open on each third stroke as an air inlet valve, something which could be done without involving any great amount of complication, the total resistance would then be 2.40 horsepower, corresponding to 65 per cent. of the actual power of the motor when turning over at the rate of 590 turns per minute.

The following table gives a resumé of the experiments:

Working Conditions.	Total Resistance.	Net Force.	Indicated Force.
No pressure	.75 h.p.	0	0
Inlet open	1.03	0.28	0.27
Inlet closed	1.22	0.47	0.46
Inlet closed; half compression	1.39	0.64	0.70
Inlet open; half compression	1.49	0.74	0.79
Inlet and release open	1.63	0.88	0.91
Inlet closed; release open	1.69	0.94	0.94
Inlet open; exhaust closed and held	1.60	0.94	0.88
Inlet through exhaust each third stroke	2.40	0.94	1.65

*Translated from *La Locomotion automobile*, by Charles B. Hayward.

HANDY HINTS FOR THE MAN WHO DRIVES

ANY self-respecting shop man will clean a shaft and bearings carefully before assembling. He will also at least go through the motion of cleaning the flat contact surfaces of joints and threaded surface of bolts and ends before he puts them together. But how many men really appreciate the fact that particles of dirt, however minute, between hard contact surfaces act something like balls, and not only separate the surfaces but make it easy for them to move relatively to each other? When parts are assembled in this manner the dirt is probably crushed and imbedded in the surfaces adjacent to the bolts, but between the bolts, unless the materials concerned are quite soft, the surfaces are sprung apart more or less. This possibly does no great harm, but when parts are dismounted and are assembled frequently it is only a question of time and carelessness for every contact surface to become so roughened that a true fit is out of the question. A careful workman will save a clean piece of waste for this part of his work, even if it is the last he has and he must wipe his hands on something else.

When a Spring Leaf Breaks.

The breakage of a spring may be serious or not according to where it occurs and how many leaves are involved. If only one leaf is broken the others will probably carry the load if care is taken not to drive fast over rough spots. The broken leaf, however, must be held in place to act as a spacer for the other leaves. To accomplish this the whole spring, if the break is in the middle, or half of the spring, if the break is near one end, must be wound tightly with clothes line or some other rope of about that size (Fig. 2). The winding is started at the small end *C* (Fig. 1), after which the rope is passed once around the spring close to the eye, tied in a single knot, and the short end is led along the top of the spring, where it will be bound tightly by the succeeding turns. The rope should be wound for some distance past the point of the break, and the free end may be fastened either to the spring seat or to the other end of the spring. If two or more leaves are broken at the middle or elsewhere the remaining leaves must be reinforced by a stiff bar of hard wood *A* (Fig. 2), laid along the top of the spring and bound in place by clothes line in the manner described in the above paragraph. The center of the bar should be over the break, and should be blocked up by suitable pieces of wood *B*, 3 or 4 inches long, so the ends of the bar will have to be sprung downward to bring them in contact with the top leaf of the spring. This puts the bar under some initial tension and increases its efficiency. In case it is the top leaf of the spring that is broken, the bar, such as just described, is necessary even if no other leaf is broken. In this case, however, it will be well for the bar to make contact with the spring leaf all along its length, and for this purpose its under surface *D* (Fig. 3) may be whittled to a curvature slightly greater than the curvature of the spring. This will produce the initial tension required, by the bar straightening itself to make complete contact with the spring when the clothes line is wound on. As a matter of safety it will be well to improvise a bumper between the spring and frame to prevent the damaged spring from being flexed beyond its safe limit. If a rubber bumper is not available one may be improvised by laying a stick of wood on top of the center of the spring and binding it on with rope wound in as many parallel turns as possible (Fig. 4). The rope will act as a cushion, and by using a considerable number of turns the shock will not be localized at one point of the frame.

Fig. 1.

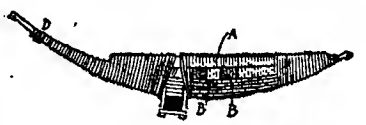


Fig. 2.

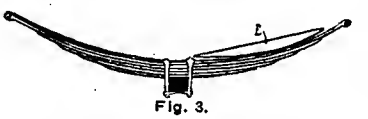


Fig. 3.

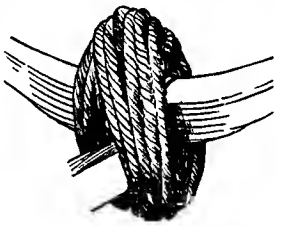


Fig. 4.

The Oily Canvas Apron.

The canvas apron used as a dust screen underneath many cars is a serious menace, and should not be tolerated without extreme precaution against the possibility of its catching fire. A long hill, an imperfectly working carbureter which forces the car to first speed instead of second, and a radiator something less than full, make a combination which can happen any day; and if under such circumstances the oil-soaked apron comes in contact with the exhaust pipe it takes but a few seconds to start a blaze. Then the only salvation is in quick action with a jackknife, by which the apron may be cut loose before the fire communicates to the woodwork or sets the gasoline tank boiling. Since the flames are fed by the oil drippings, and not to any important extent by the canvas itself, it follows that the insertion of an asbestos section around the exhaust pipe would not help matters. A tin section, if it had sufficient slope to insure the oil on it draining away instead of accumulating it, undoubtedly would be much safer, and for an extra precaution the upper half of this slope could have a raised flange around the hole through which the exhaust pipe passed, thereby preventing the oil from dripping on the pipe. Of course, the hole should be large enough so that the pipe would not ordinarily touch the tin.

Annoyance of Clogging Gas Tubes.

The small copper tubes commonly used for connecting the generator and the lamps rapidly clog, and in the course of a season or two they require attention. Most of this clogging will be found to take place at the ends and wherever moisture can accumulate. Water in any part of the pipes is a great annoyance, as it causes flickering of the lights, and the piping should throughout be arranged to drain the pipes toward one or both ends. It is better and generally easier to drain back to the generator, but in case this cannot be arranged the forward ends of the pipes may be cleared of water by disconnecting the rubber tubes and blowing through with a tire pump. Pipes found to be clogged may frequently be saved by cutting off an inch or two from their ends. Occasionally this results in small explosions, due to detonation of the acetylide of copper which generally forms in the pipes, and it is well to keep one's eyes and fingers out of range of the ends of the pipes while the sawing or cutting is going on. A few car makers use a larger than standard size of tubing for this work, the aim being to avoid clogging by small particles. This aids matters wonderfully. A few repairmen clean these pipes by forcing water back and forth through them, which is correct, provided proper means are followed to get the water well removed from the pipes after the cleansing operation is completed. Keeping these tubes clean is a very small matter in itself, but it is one of the innumerable little odds and ends about a car, the proper maintenance of which makes for comfort in its running, or the reverse. The careful man's car is always ready to take the road in good shape, whereas the shiftless driver's car is always minus something or other and is always causing trouble in an endless number of ways.

LETTERS INTERESTING AND INSTRUCTIVE

COMPOUND ENGINES ON THE AUTOMOBILE.

Editor THE AUTOMOBILE:

[1,474.]—Can you tell me if compound gasoline or gas engines have ever been built? Why should not compounding be an advantage in the internal combustion motor the same as it is with steam? There seem to be great possibilities in the subject and it appears strange to me that no one has taken it up thus far or if this has been done, that so little has been heard of the results. Some light on the subject would doubtless be of interest to the majority of your readers. COMPOUND.

Norristown, Pa.

Compound gas engines have been built for some years past, and in certain cases have been found advantageous for stationary power service, but the gain is not sufficient to act as an inducement to their further development at the present moment, apparently, as there are comparatively few firms building such engines. A compound gasoline motor has been built in this country for several years past at Middletown, Conn., the car itself being known as the Compound. There are now several taxicabs running around New York City that are fitted with this type of motor, built by the concern in question. The fact that the car has not met with any great success in the three or four years it has been on the market seems to be due more to the fact that its builders have constantly been in financial trouble, rather than to any inherent defect, either in the principle or the construction of the motor. The latter has two high-pressure cylinders, placed on either side of the low-pressure cylinder, into which they exhaust alternately. We have never seen the result of any brake or efficiency tests as compared with a single-acting, two-cylinder four-cycle motor, and hence cannot say how the compound compares in this respect with the simple engine. It is not possible to compare the internal combustion motor with the steam engine where compounding is concerned, as the active fluids are of a totally different nature. Steam will retain its heat, and, in consequence, its pressure for a much longer period, than will the mixture of gases resulting from the explosion in the cylinder of gasoline engine. On this account it has been found advantageous to expand steam three, or even four, times in an engine before exhausting to the condenser. Steam is utilized at a comparatively low pressure, say 160 to 200 pounds to the square inch at the boilers, insuring a mean pressure of considerably better than 100 pounds to the square inch on the piston of the first, or high-pressure, cylinder, assuming 160 as the boiler pressure. The piston of the intermediate cylinder will receive about half or less than half the mean pressure of the first cylinder, and third expansion will result in exhausting the gases at about atmospheric pressure or slightly below.

On the other hand, the pressure in the internal combustion motor will rise as high as from 300 to 400 pounds to the square inch at the point of ignition, but will drop to 40 pounds or less at exhaust, even in the short-stroke automobile motors, so that the mean pressure will scarcely exceed 60 to 70 pounds per square inch on the piston throughout the stroke. It is this extremely rapid drop in temperature and pressure that prevents the efficient use of the products of explosion in a further expansion taking place in another cylinder. The loss caused by the transfer from the high to the low-pressure and the condensation caused by coming in contact with the comparatively cold walls of the latter, is so great that compounding seems a doubtful advantage, particularly on the automobile motor. The parent Daimler works in Germany experimented with the compound motor two or three years ago and it was claimed that the result of their investigations was a motor much superior than those previously brought out, an improved method of transfer of the charge having been adopted.

WHAT CONSTITUTES "RUNNING" A CAR?

Editor THE AUTOMOBILE:

[1,475.]—Last week's "Automobile" contained an inquiry concerning the smallest essential individual piece of a gasoline automobile. The inquiry was prompted by a wager that the writer could not take from a large touring car that had just arrived at the curb, an individual part, so essential that without its replacement the car could not continue its journey, said part to be so small that it could be concealed between the thumb and forefinger with ease. The wager was accepted, and the writer removed the small rubber washer from the valve in the air stem of one tire. The tire went flat, and the bet was won. The little rubber washer weighed exactly two grains on a jeweler's scales.

Since the question appeared in "The Automobile" numerous letters have been received suggesting parts as called for in the query, but no one has so far suggested the right answer. The query called for the smallest essential individual part, and a combination of two or more pieces does not properly come under that description.

Marshall, Minn. A. D. HARD, M.D.

If you will refer to your original letter on this subject, you will find that no mention was made of the condition of being able to conceal the smallest essential part between the thumb and forefinger. Furthermore, we do not consider that the washer in question meets the requirements of a part so essential that without its replacement the car could not continue its journey. Have you never heard of a car running on a flat tire or on the bare rim? We have known of instances where not merely a few miles, but several hours' run have been accomplished on the rim. In your previous letter you stated that the part was to be such that without it the car could not be run. It may not be economical or good policy to run a car on a flat tire or without any tire, but it must be admitted that there is nothing to prevent its running, if the owner wishes to do so. If, as expressed in your former letter, the condition of the bet was based upon the ability of the car to run after you had removed the smallest essential part, your friend of the flat tire gave up entirely too easily when you took away the washer.

ADVICE FOR A PROSPECTIVE BUYER.

Editor THE AUTOMOBILE:

[1,476.]—How can I find out the good or bad qualities of the Aerocar, made by the Aerocar Motor Company of Detroit? Can you tell me anything about it? N. A. BIORN, M.D.

Ada, Minn.

"Ask the man who owns one," would appear to be pretty good advice on a subject of this kind, but where you are not in a position to get a frank opinion from an unbiased personal acquaintance, about the only thing to do is to note what the car can do on as strenuous a demonstration as the agent will grant, and dealers are very liberal in this respect where a buyer means business. It is sometimes possible to find an agent who will frankly tell you the weak points of a car, as well as its good ones, though the genus is rare, and it doubtless would be well for all concerned if there were more of them.

EFFICIENCY OF METHODS OF TRANSMISSION.

Editor THE AUTOMOBILE:

[1,477.]—I presume the question has been threshed out at great length in the past, when interest in the subject was keener, but I would like to revive it temporarily for my own information and doubtless that of others. Of course I realize that the chain-driven type of automobile has almost disappeared and that, sooner or later it will give way altogether to the shaft-driven type. What I wish to learn, whether this has been done as the result of the technical disadvantages of the chain; that is, its lesser efficiency, or merely for looks and silence. H. L. ABERCROMBIE.

Washington, D. C.

Drive by double side-chains is slightly more efficient when the chains are new and well-lubricated than is the case with the shaft and bevel gear drive, although in the case of an

automobile the shaft and bevel gears are present in either type, the chief difference lying in their location and the necessary angularity of the propeller shaft. However, the fact that in the chain-driven car, the clutch, gear-set and countershaft are all in the same plane, is an advantage, which is further added to by clean driving chains. But as the latter become dirty, and as the sprockets and chain links wear, this advantage is more than offset, so that under ordinary service conditions of running the shaft drive is really the more efficient. The question was really not one of efficiency, however, but rather one of silence and greater ease of protecting the driving mechanism. The propeller shaft and bevel gear readily admit of this, and while the chain also does so, in that a boot or case may be put over each chain, the latter method of protection never appears to have attained any popularity. Even with clean chains the chain-driven type of car is necessarily more noisy and there seems to be little doubt that the attainment of silent-running has really been the chief moving factor in the adoption of the shaft drive.

WHAT CAR FILLS THESE REQUIREMENTS?

Editor THE AUTOMOBILE:

[1,478.]—Will you kindly inform me what car (automobile) will meet these desired requirements of a physician, to wit: Weight of runabout not over 1,500 pounds, track 60 inches, wheelbase 90, horsepower 20-24, radiator and pump, engine four-cylinder, upright, roller bearings throughout, full silliptic springs, front and rear, tire size 30 by 3 1-2, shaft drive. All other parts up-to-date and durable; suitable for sand and mud. Hard work all the time.

Mobile, Ala. W. R. JACKSON, M.D.

Judging from the immediate response to a recent letter from a would-be purchaser of a car who did not expect to have his ideal realized for some time to come, there must be not a few makes on the market at present that will fulfill your requirements regardless of how exacting they happen to be. Barring a few exceptions to your specifications, it is not difficult to call to mind several cars of the kind. There is one bad feature about your proposed car, and that is the use of 30-inch wheels. Such small wheels not only make uncomfortable riding, but are a very poor investment from the point of view of tire expense. A 34 by 3½-inch tire will give very much better service, difference in first cost considered, than will the 30-inch size, and if you are willing to specify 36-inch wheels your car will be that much better for them. As a matter of fact, we doubt very much if you will find any 24 to 30-horsepower four-cylinder cars on the market to-day with smaller than 32-inch wheels, while the majority are equipped with either 34 or 36-inch sizes. Any of our readers who think they can supply a physician's car for the strenuous service outlined may compare their specifications with his in these columns.

REGARDING THE USE OF A DECARBONIZER.

Editor THE AUTOMOBILE:

[1,479.]—There is a certain mixture advertised under the name of Radium Decarbonizer. The makers claim that by injecting a few ounces into cylinders or splash tank of an auto engine, all carbon deposits will be dissolved, and pass out of muffler in black smoke. They claim also that Decarbonizer will not injure in any way any part of the engine. In fact, Decarbonizer works on carbon and nothing else. I have been trying to find some one in this section who had tried Decarbonizer. Garage keepers and expert chauffeurs, whom I have asked, advise me to let some other fellow try it first, and until then to stick to kerosene and a scraper to remove carbon. Possibly some of your New England subscribers have tried Radium Decarbonizer, and if so, they could give some advice through "Letters Interesting and Instructive."

Concord, N. H. C. F. M. STARK.

In the past half year we have received quite a number of inquiries on this subject and if any of our readers who have had personal experience with Radium Decarbonizer in their motors will contribute the resulting knowledge for publication in these columns, we have no doubt it will prove beneficial to a great many other subscribers besides those who have taken the trouble to inquire in the past.

CORK INSERTS WOULD REMEDY DIFFICULTY.

Editor THE AUTOMOBILE:

[1,480.]—In your issue of a recent date there appears a letter from R. S. Trulock in which he states that he has tried various remedies to prevent the leather cone clutch in the planetary gear of a 16-horsepower touring car from slipping. We should have written to Mr. Trulock personally in relation to his difficulties were it not for your comments following his letter in which you say "no friction clutch can be made to hold where it is exposed to lubricating oil in any quantity, and that nothing can be put on the facing which will prevent the lubricating oil from causing it to slip," also suggesting a rather expensive system of guards to prevent the oil from reaching the clutch.

We have during the past three years used the columns of "The Automobile" and other publications in describing the results obtained by cork inserts, and technical writers for the automobile publications have said that cork inserts in leather-faced cones practically entirely prevent the trouble referred to, as the coefficient of friction of a cork insert clutch is not materially affected by oil.

Leather-faced cone clutches fitted with cork inserts have been used in some eight thousand automobiles, being the standard equipment of the Pierce, Pope-Hartford, York, Chadwick, De Luxe, and nearly fifty other makes of cars. As evidence of what cork inserts do, we desire to call your attention to the fact that 50 per cent. of the cars now contesting for the Glidden prize are fitted with cork insert clutches or brakes.

Under the circumstances we think that those in trouble should be advised of this fact rather than to have suggested to them a more expensive, and perhaps less satisfactory, method of eliminating the difficulty. NATIONAL BRAKE & CLUTCH CO.,

W. W. WHITCOMB,

Boston, Mass. President.

WANTED: A REAL HILL CLIMB FOR STOCK CARS.

Editor THE AUTOMOBILE:

[1,481.]—Can you tell us whether or not there is to be a hill-climbing contest on Mt. Washington this summer? We are looking for contests of greater length than the average climb, which at present seems to be in vogue. If you can consistently make any mention of the points which we refer to in this letter, would be glad to have you do so, as we believe that among the clubs which watch the column of "The Automobile" some would take the hint and arrange a contest where cars will undergo a hard, 3, 4 or 5-mile grind.

We believe that the automobile industry owes to itself and the public a contest of this sort, which will demonstrate actual climbing ability under the most adverse road and grade conditions. In such a contest, the special featherweight "sky-rockets" which are entered as stock cars, would be eliminated. In the hill climbs such as we have been having, the manufacturer who enters a genuine stock car (in all that the term applies), has very little chance against cars equipped with a paper body, postage stamp mud guards, and ratio of gearing adjusted to suit conditions exactly.

If we cannot pit our cars against anything but these freaks, will someone give us a climb so severe that they will go to pieces. A car loaded with dynamite and stripped of every ounce of weight possible, will stand together long enough to fly up a smooth half, or three-quarter mile grade; but give us a climb which will demand strength and real endurance in every entry, and the manufacturers who are really racing stock cars will rise up and thank you for any effort you put forth to secure such contests.

CAMERON CAR CO.,

H. M. DOHERTY,

Beverly, Mass. Sales Mgr.

TO PREVENT RUST ON WHEEL RIMS.

Editor THE AUTOMOBILE:

[1,482.]—Referring to Robert Jewett's inquiry, No. 1460, in the July 9 issue of the "The Automobile," if the wheel rim is painted with a mixture of shellac and finely pulverized flake graphite (mixed to a stiff paste), rust on wheel rims with its attended bad effect upon tires may be largely eliminated or entirely eradicated. After treating the rims as indicated above, it will be found that they are very even and a waterproof film of great smoothness is formed. The graphite is absolutely inert and there need be no apprehension regarding a detrimental effect upon the rubber.

If the whole inner shoe is painted with a mixture of graphite and shellac, there will be little tendency for the tube to stick. We have been advised by some tire manufacturers that they use Dixon's Flake Graphite as indicated above. In this connection, would call attention to the advisability of treating all threaded connections with a mixture of flake graphite and oil. It will be found that the connection can be easily taken apart and there will be no tendency for the joint to be tightly rusted.

Jersey City, N. J. JOSEPH DIXON CRUCIBLE CO.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows and Meetings.

Dec. 31-Jan. 7..—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reeves, general manager, 29 West 42d St.

Jan. 16-23.....—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. Office of Secretary, 7 West 42d St., New York City.

February, 1909..—Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. (Exact date to be announced.)

Races, Hill-climbs, etc.

Aug. 14.....—Chicago, Third Annual Algonquin Hill Climb, Chicago Motor Club.

Sept. 5-9.....—San Francisco-Los Angeles Reliability Run, Automobile Dealers' Association of San Francisco.

Sept. 14.....—Chicago, Annual Economy Run, Chicago Motor Club.

Oct. 24.....—Vanderbilt Cup Race, Long Island Course, auspices of Vanderbilt Cup Commission.

Nov. 26.....—Savannah, Ga., Grand Prize Race, Savannah Automobile Club.

FOREIGN.

Shows.

Oct. 11-18.....—Paris, International Congreee and Public Exhibition on Roads and Road Making for Modern Locomotion, French Ministry of Public Works.

Nov. 28-Dec. 13—Paris, Eleventh Annual Salon de l'Automobile, Grand Palais, Automobile Club of France (Pleasure Vehicles, etc.)

Dec. 22-29.....—Paris, Eleventh Annual Salon de l'Automobile. (Commercial Vehicles, etc.)

Races, Hill-climbs, etc.

Aug. 12.....—Ardennes Circuit Races and Coupe de Liederkerke, Automobile Club of Belgium.

Aug. 29-30.....—France, Mont Ventoux Hill Climb, Vaucluslen Automobile Club.

Sept. 1-8.....—French Voiturette Contest, Auspicee "L'Auto."

Sept. 6.....—Bologne, Italy, Florio Cup Race, Automobile Club of Bologne.

September.....—Paris, Vichy Aeroplane Competition, $4,000 Prizes, Aero Club of France.

Oct. 11.....—Berlin, Germany, Gordon Bennett Balloon Race, Aeronautical Club of Berlin.

AMERICAN AUTOS IN PALESTINE.

A report from the consul at Jerusalem, Thomas R. Wallace, says that a party of American tourists made a trip through Palestine this spring in an automobile without encountering any great difficulty. Great interest has been aroused throughout the district, and a number of people are talking of investing in cars. The consul recommends a light, strong car with high clearance, a good hill-climber, and selling at a medium price, and suggests that a repair and supply shop would increase the chance of sales. Under the present law permission must be obtained from the Turkish Imperial Government to use a car in the country, and as this may be granted or withheld at the whim of some official, the automobile's status is not exactly settled yet.

AUTOS HAD BECOME EDUCATED.

Some of the villagers were overheard discussing the Amir's motor car, says the *London Spectator*. "It is not a carriage, for it has no horses," said one. "It is not a train, for it has no rails," said another. "My brothers," said the oldest of the graybeards, "ye are as fools having no understanding. For fifty years the sahibs have been training their devil carriages to run on rails. Now at last they have learned to run by themselves."

A GREAT MOTOR BUGGY STATE.

INDIANAPOLIS, IND., July 20.—In no other State in the Union are the carriage and automobile industries so closely allied as in Indiana. The carriage factory of any importance at all, or the carriage repository, without one or more automobile agencies is very largely in the minority according to some of the recognized authorities of both trades.

With one notable exception, that of the Studebaker Bros. Manufacturing Company, of South Bend, carriage factories so far are confining their efforts largely to the high-wheeled motor buggy, so far rather an untried quantity among Indiana dealers.

Of the 40 concerns manufacturing motor buggies, eleven are located in Indiana and a twelfth company will bring out a vehicle of that type within the next few weeks. Within the next six months half a dozen other Hoosier carriage concerns will have motor buggy models out, so that the situation next season will be watched with no little interest.

Indiana companies now manufacturing motor buggies are: Albany Automobile Company, Albany; Butler Company, Butler; Economy Motor Buggy Company, Fort Wayne; W. H. Kiblinger Company, Auburn; T. J. Lindsay Company, Indianapolis; Mier Carriage & Buggy Company, Ligonier; Postal Auto & Engine Company, Bedford; Reeves Pulley Company, Columbus; Single Center Buggy Company, Evansville, and Zimmerman Manufacturing Company, Auburn.

HAND BOOKS FOR AUTOMOBILISTS.

Italian Club's Annual Touring Handbook Ready.—There has just appeared for the year 1908 *l'Annuario dell'Automobilismo del Touring Club Italiano*, this being the official title of the yearbook of the Italian automobile club, which has its headquarters at Milan. It is a conveniently arranged volume of several hundred pages, printed on thin paper to keep its size within the limits of a pocket, and contains every item of information that the tourist can possibly need, not alone when traveling through Italy, or about to enter that kingdom, but also concerning the remainder of the Continent. Some idea of the thoroughness with which it has been prepared may be gained from the fact that no less than 1,000 places at which gasoline and lubricants may be obtained are listed, in addition to some 1,500 garages, 2,000 hotels and 1,200 repairmen, all of which have the official sanction of the Touring Club, and whose capacities and qualifications are set forth in the lists. Americans contemplating a tour through the delightful scenery afforded by Italy should not fail to avail themselves of this great fund of information, which, together with the other advantages afforded by the Italian Touring Club, may be obtained through membership in the American Automobile Association.

Route Book, Automobile Club of France.—The ninth annual edition of the *Annuaire de Route de l'A. C. F.* is now off the press. It has been enlarged by 70 pages since the edition of 1907 and contains a great deal of additional information, now giving the addresses of all supply depots, repair shops, builders, garages, hotels and the like both in France and the remainder of the Continent, besides 3,000 names of automobile dealers. It also contains the address of every club affiliated with the A. C. F., local touring committees and the like, in addition to which there is a special chapter devoted to customs, tryptiques, methods of shipment, tariffs, telegraph and postal rates, average price of gasoline, oil and similar supplies in practically every country of the Continent, as well as Great Britain and the United States. A great many itineraries for both France and other parts of Europe are given, as well as something like 150 new maps of cities, showing where to find the best hotel, garage, railway station, telegraph office and the like.

The French Society of Engineers has awarded its annual prize to M. Robert Esnault-Pelterie for his article upon lightweight motors.

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CONCERNING AUTOMOBILE COMPETITION.

In the progress of the automobile, competitive events of various kinds have been of unquestioned benefit, resulting in better vehicles and calling widespread attention to the industry itself. In parts of the country where the automobile is of recent introduction, there is still need and advisabilty for diversified contests under the auspices of the local club or local trade body, or, better yet, under some sort of joint arrangement, for it is a natural sequence that the man who pays the bills should have something to say in the premises—and this holds good to an even greater degree when it comes to national events with their increased expenses. Wherefore the existence of the now perfected General Conference Committee involving the American Automobile Association and the N. A. A. M. and the A. M. C. M. A.

That it should come within the province of this committee to decide what events are to be classed as national or international, is logical and expected, and while there will always be those who, for the sake of personal and temporary gain, will find ways of evading that which is for the common good, it is a certainty that the American makers are determined to countenance and support only those contests in the instituting of which they have a voice, for, let it again be remembered, they pay the bills. The decision of the N. A. A. M. to notify the foreign clubs that the A. A. A. is the seat of sport and other automobile government in this country, and that only through this channel will international conditions find acceptance, is action that is a part of the program outlined for the future. The particular thing aimed at at this time is the ridiculous attitude of the foreign clubs in threatening to bar from competition abroad the American concerns which participate in the Vanderbilt Cup race. We *must* run our race according to the foreign rules, though we had naught to say in their framing!

Most extraordinary is the manner in which the A. C. A. has convinced itself that it is in honor bound to hold a race in the South for those manufacturers of foreign automobiles who have been inspired to find grievous fault with the American rules for the Vanderbilt Cup race in America. True it is that they have greater speed than ever, these 1908 Grand Prix cars, and also possess horsepower in excess of what can be utilized over any road constructed, yet it seems that—according to the much-referred-to rules—they do not have quite as much piston area as some of the American cars which were ready for a 1907 race that was not held, and which the American makers would like to use this year before sending them to the scrap heap. It was not possible to race these cars in the 1908 Grand Prix of France, and so one American maker went to the heavy expense of fitting up another car of less piston area and also less horsepower than any other car in the race and went abroad, handicapped and illy prepared, to meet the best lot of racing craft that has ever engaged in international automobile sport.

Between now and October 24 the foreign maker could spend a few hundred dollars in giving his cars more piston area—though it appears to have been demonstrated that the longer stroke answers adequately—but this would inconvenience him quite a bit, and, then, there is the expense to consider. Consequently, it is up to the American makers to get busy at once and build new cars, for they are well able to bear the expense, and, of course, they want to be as courteous as possible to the foreigners who race in America for the sole purpose of assisting them in the sale of their product. If the foreign makers are asked to repeat the Grand Prix in sideshow style, the race will not be intensely interesting. There should be some hastily built American cars of the proper piston area to supply the "also ran" contingent.

But it is apparent that the great bulk of American makers are quite firm in their adherence to the classic Vanderbilt, to be run within flashlight of New York City, over the best course in its history, and before a million and more spectators. And the foreigners are welcome—ten from any country, not five as in previous years—but if they technically fear a little more piston area and will not allay their apprehension by spending a few dollars, then their places will be filled by more Americans, who otherwise would be limited to ten in number. In the Grand Prix every maker had the right to enter three cars, and so France supplied nearly half the entries and thus had the best chance of all to win. But here in America the American maker asks no advantage in numbers. He does ask, however—and intends to have—his rights respected when it comes to the acceptance or the rejection of so-called international rules.

Coercive efforts will result fruitlessly, as is made very clear by the decision of the Central Conference Committee, and, since the game is to be played along the line of disqualifying, those who participate in unsanctioned contests will find the Long Island Motor Parkway a closed thoroughfare as far as they are concerned, to say nothing of all other regular events. If for the moment the American maker finds that he cannot compete in the Grand Prix of France, he is not likely to lose much sleep, for he will pursue the even tenor of his way and continue to produce and sell more automobiles than several European countries combined. And that idea of having the A. A. A. tour for 1910 in the British Isles may become more than a suggestion.

AMERICAN MAKERS WILL SEND WORD TO FOREIGN CLUBS

NOW it is the National Association of Automobile Manufacturers which will notify the recognized automobile clubs of Europe that in this country it will participate only in events conducted under the rules of the American Automobile Association, which it recognizes solely as the governing body in this country and which it will assist in maintaining its supremacy. This action was taken at a meeting of the executive committee, held in New York City, July 15, those present being the following:

Thos. Henderson,	representing	the Winton Motor Carriage Co.
S. T. Davis, Jr.	"	" Locomobile Co. of America.
G. W. Bennett,	"	" White Company.
Charles Clifton,	"	" George N. Pierce Co.
W. E. Metzger,	"	" Northern Motor Car Co.
S. D. Waldron,	"	" Packard Motor Car Co.
W. R. Innis,	"	" Studebaker Bros. Mfg. Co.
C. W. Hildebrand,	"	" Stevens-Duryea Co.
L. H. Kittridge,	"	" Peerless Motor Car Co.
W. M. Lewis,	"	" Mitchell Motor Car Co.
R. D. Chapin,	"	" E. R. Thomas-Detroit Co.

S. A. Miles, General Manager.

The subject came before the meeting as the result of action taken at Buffalo, July 14, at a session of the General Conference Committee of the American Automobile Association, the National Association of Automobile Manufacturers, and the American Motor Car Manufacturers' Association, when it was decided that it would not be advisable or just at this late day to change the rules for the Vanderbilt Cup race for this year. The manufacturers not only adopted a resolution indorsing this action, but decided to advise the recognized clubs of Europe that the manufacturers regard and will recognize only the American Automobile Association as the governing body of the United States, and that they will support only such events as are organized or sanctioned by the A. A. A. The attention of clubs of Europe, and of manufacturers, owners, and drivers of cars will be called to the fact that participation in any other event will lead to disqualification, which means that offenders will be debarred, not only from the minor events, but from the Vanderbilt Cup race, and from all events to be conducted on the Long Island Motor Parkway, which is, of course, the greatest speedway in the world.

The committee considered a proposition to conduct a transcontinental contest between New York and San Francisco; learned that the proposed event had not been sanctioned and would not be sanctioned without the consent of the manufacturers, and decided that such a contest is at present unnecessary. The same action was taken in the matter of certain proposed race meets in the neighborhood of New York, which, according to report, certain promoters have decided to hold with or without sanction.

The method of space allotment at the Chicago show was discussed at length, but will form the subject for August 5.

ANNUAL GOOD ROADS AND LEGISLATIVE CONVENTION ASSURED

THE success of the Good Roads and Legislative Convention held at Buffalo, July 7 and 8, by the American Automobile Association, the National Grange, and the American Roadmakers' Association, will probably lead to the calling of a similar convention each year. Resolutions passed follow:

Resolved, That in view of the signal success attending the convention held this year, a national convention of similar character be held annually, and that the national committee having in charge such convention for the year 1909 be as follows:

Robert P. Hooper, Philadelphia, chairman A. A. A. Good Roads Board, Chairman.

Ex-Governor Nahum J. Bachelder, Concord, N. H., master of the National Grange.

James H. MacDonald, Hartford, Conn., president American Roadmakers' Association.

Charles Thaddeus Terry, New York, chairman A. A. A. Legislative Board.

S. D. Waldron, Detroit, Mich., representing the National Association of Automobile Manufacturers.

Frank B. Hower, Buffalo, N. Y., chairman A. A. A. Touring Board.

Alfred Reeves, New York, representing American Motor Car Manufacturers Association.

William H. Hotchkiss, Buffalo, N. Y., president American Automobile Association, ex-officio.

Resolved, That the president of the American Automobile Association be and hereby is authorized to appoint an executive committee of twenty-one members, including the nine members composing the committee upon the national convention of 1909; the duty of which executive committee shall be to see to it that the plans and purposes determined by the national convention of 1908 shall be carried out to their consummation, and that the measures approved by the convention be pressed to passage and enacted into law in the various States of the Union and by Congress.

Resolved, That such executive committee shall have and is hereby given power to add to its membership, by a two-thirds vote of its members, the representatives of such other body or bodies as may add strength to the movement for good roads and fair legislation, such additional members not to exceed five in number.

The national convention committee named above will shortly hold a meeting, at which the additional members of the committee for 1909 will be appointed. Other organizations having the same objects in view are expected to name representatives, who will then be added to the executive committee. Some idea of the national character of the convention may be gained from the fact that there were present 229 accredited delegates, including representatives nominated by the governors of 20 States, and others from about 60 clubs of the A. A. A. Eleven States and the province of Ontario were represented by their chief highway officials. Also in attendance were former Governor Bachelder, the Master of the National Grange; State Masters Derthick, of Ohio, and Godfrey, of New York, and J. E. MacDonald, J. W. Hunter and E. L. Powers, respectively president, vice-president, and secretary of the American Roadmakers' association.

The proceedings of the convention are now being compiled and printed, and will shortly be distributed throughout the country.

WHY THE RECOGNIZED CLUBS CANNOT RECOGNIZE THE A. A. A.

PARIS, July 15.—Apparently there is one insurmontable present reason why the International Association of Recognized Automobile Clubs could not, even if it so desired and found advisable, place on its membership list the American Automobile Association as the successor of the Automobile Club of America. The present constitution of the international body of clubs provides that only one club can have membership from a country, and no provision whatever is made for an association of clubs from a country, and 'tis a hard task to amend constitutions.

This situation was made very clear to the foreign relations committee of the A. A. A. at Dieppe, though it should be repeated again that this committee made no effort whatever to obtain at this time any membership in the international association, contenting themselves with making known the fact that it was the A. A. A. which had and did control racing.

Though the delegates of the recognized clubs now have a fairly comprehensive and correct idea of the situation in America, not a few of them are embarrassed with the probability

that the American situation may duplicate itself in their own countries; in fact, such actually is the case in Great Britain, where the Royal Automobile Club is finding itself most stubbornly opposed by the Motor Union of Great Britain and Ireland, which body seems to be getting much the better of the waging controversy. In Germany, the Imperial Automobile Club is having some difficulty in retaining its club aristocracy, and while temporarily the Automobile Club of Italy seems to be in the ascendency, there is likely to be a renewal of a troubled situation in that country.

Therefore, it is plainly apparent that in insisting upon recognizing the Automobile Club of America as the seat of government in America, though it has as yet no racing to govern, the recognized clubs come pretty close to "saving their own faces" by preventing the spreading of the idea that all of the clubs of a country, through national officers of their own sclection, should figure in the international congress.

While the recognized automobile clubs profess to concern themselves with other affairs than racing, it is an established fact that its other activities are minor in character and frequently—especially in the matter of touring—is excelled by similar work of other organizations. For instance, in France one finds the Touring Club of France the best source for information of this sort, and in England both the Motor Union and the Automobile Association meet the necessities more satisfactorily than the Royal Automobile Club. Also in Italy, the touring club of that country duplicates the work of the French organization.

There being only one speed contest of real international importance—that of the Grand Prix of France—the Automobile Club of France practically dominates the racing situation, and such domination finally reduces itself to the Sporting Commission of the Automobile Club of France, and its most forcible and sometimes stubborn chairman is Rene de Kynff, managing director of an automobile company. The majority of the Sporting Commission being composed of French manufacturers, it is a natural and expected sequence that the racing interests of France are first considered in the international rules.

The impression that exists on this side is that the American manufacturers will never succeed in winning the Grand Prix and that they are wasting their money in the attempt. Furthermore, the French makers intend to discontinue racing in America as soon as they do not sell enough cars in that country to commensurate them for the heavy expenses. Just at the present time it is not so much a question of New York or Savannah, but a question as to whether they will participate at all. If they do participate, it is the privately expressed belief that they will not permit the Vanderbilt Cup race to be neglected, even though their entries will be made in a roundabout way.

NEW JERSEY'S BIG CLUB BELIEVES IN WORTH OF ORGANIZATION

NEWARK, N. J., July 18.—That the Associated Automobile Clubs of New Jersey should take on a new lease of life and become a most powerful factor in ameliorating automobile conditions throughout the State, is the opinion of the New Jersey Automobile and Motor Club, the largest club in the State. Various rumors have been set afloat recently, apparently for various reasons, and, in order that there could be no misunderstanding of the exact situation in New Jersey, a meeting of the trustees of the New Jersey Automobile and Motor Club was called for Thursday night, when these resolutions were adopted:

Whereas, Statements have recently appeared in the press representing that the New Jersey Automobile and Motor Club was about to sever its relations with the Associated Automobile Clubs of New Jersey and also its relations with the American Automobile Association, and

Whereas, Statements have also appeared that this club was not in accord with the policy of the Associated Automobile Clubs of New Jersey in testing the constitutionality of the law; therefore be it resolved:

First—That this club is and always has been loyal to the Associated Automobile Clubs of New Jersey and expects to remain so, believing that the fundamental principle of organization is absolutely necessary for the success of all undertakings.

Second—That this club is in hearty accord with the management of the American Automobile Association and has no intention whatever of severing its relations with the association, but desires to cooperate with it in its efforts to better automobilists and automobile interests.

Third—That this board is in hearty accord with the proposed suit to test the consttutionality of the law, and to subscribe its necessary pro rata share of the expense of same in compliance with the wishes of the members of the club as expressed by a resolution unanimously passed at the annual meeting of the club on May 4.

Fourth—That copies of these resolutions be sent to the secretaries of the American Automobile Association and the Associated Automobile Clubs of New Jersey, and to the Press.

It is understood that the New Jersey club intends to concern itself immediately with increasing the efficiency of the State body, and plans are under way for a convention of all road users at Atlantic City, the result of which should be a better understanding between the automobilists and the farmers and all others who use the excellent roads of the State.

The Newark *Star* prints the following in its report of the New Jersey club's meeting: "As far as any stories of the local club resigning from the American Automobile Association are concerned, that subject has never been hinted at in New Jersey papers, and was suggested by the automobile man of a New York paper who found news dull one day last week. His article was widely copied until it grew from a suggestion into an absolute statement. The feeling between the Jersey club and the A. A. A. has always been cordial, and whatever friction there has been in the case of the New Jerrsey federation has arisen principally because the members of the Newark club failed to get the membership cards in the A. A. A. to which they were entitled. This matter has been amicably settled."

CHICAGO'S BID FOR THOMPSON CUP STOCK CAR RACE

CHICAGO, July 20.—The announcement that the Chicago Automobile Club wants the Thompson stock car race of the American Automobile Association has aroused a great deal of interest in automobiling circles in this part of the country, particularly as the club's application for the big event was preceded by a painstaking investigation of an available course by Chairman J. F. Gunther, of the racing board of the club. When President Hotchkiss of the A. A. A. was in Chicago attending the Republican convention, his conversation with the directors of the club led them to believe that an application for the event might receive favorable consideration, if backed up by a suitable course and military protection which appear to be forthcoming.

The projected course is in Indiana not far from Chicago, and is a 22-mile circuit without a railroad crossing on it and with but two small towns, through one of which at least no control would be necessary. There are 11 turns in all, some of them sharp, while the straightaway stretches are long and fast. With the exception of three miles, the course is an 18-foot strip of good macadam and the break in question is now in course of construction. On the tour of inspection, A. J. Banta's Locomobile roadster made 65 miles an hour on the straightaway with five people up, which gives some idea of the speediness of the course. One great disadvantage, however, lies in the necessity of establishing a control through Lowell, Ind.

GRAND PRIX WINNER TO COMPETE IN VANDERBILT RACE

PARIS, July 18.—The purchase by Robert Graves of Lautenschlager's winning Mercedes insures the appearance of the speedy German victor of the Dieppe circuit in the coming Vanderbilt race on Long Island next fall. Mr. Graves is a member of the Vanderbilt Cup commission, as well as of the Racing Board of the American Automobile Association, and constitutes one of the foreign relations committee of the A. A. A., which was appointed some weeks ago. He has already entered a Mercedes car in the Vanderbilt race this year, nominating the car which took part in the race of 1906 over the Nassau County course. His purchase of the new Mercedes which performed so well in the French race may mean that he intends to enter a second car in the Vanderbilt, or that he intends this recent acquisition to take the place of the older car previously nominated, but at all events it is certain that the Grand Prix winner will figure in the event to be held over the Long Island Parkway course, part of which is now being rushed to completion for this purpose and will shortly be ready for trials.

Just who will handle the wheel of Mr. Graves' most recent addition to his stud of racing cars when it lines up before the starter next fall is at present uncertain, but, figuring from past precedent, it is quite likely that he will bring over one of the Continental racing cracks, and it is not at all improbable that this may be Lautenschlager himself. In previous events, Mr. Graves has retained Jenatzy, and the red-bearded Teutonic Mephistopheles has become a familiar hero on the Long Island course. That driver is now a Mors pilot.

The Mercedes racer which figured so prominently in the Grand Prix is rated at 120-horsepower, and is a specially designed racing car that embodies numerous departures from the standard construction of the German factory. The four cylinders are cast in pairs as usual, but they have been designed with domed heads and have the valves placed in the head, thus following a design which has come to be accepted as making for the very highest efficiency. The cylinder dimensions are 155 mm. bore by 170 mm. stroke, or the equivalent of 6.09 inches by 6.68 inches. A honeycomb radiator is employed in connection with a centrifugal pump for circulating the cooling water, while a Bosch high-tension magneto constitutes the ignition system. The first step in the transmission of the power consists of a Lindsay spiral spring clutch, while the gear-set provides four forward speeds and is built with three shafts. Final drive is by means of double side chains. The wheelbase is 106.25 inches, while the tread is slightly less than the American standard.

FARMAN COMING WITH HIS AEROPLANE.

Henri Farman, the French aviator, is now on his way to this country to give a series of public exhibitions at the Brighton Beach race track, which a syndicate in conjunction with the Aero Club of America arranged for recently. The aeroplane left Antwerp last Friday on the *Kroonland*. M. Farman was to sail from Havre on the same day, but at the last moment, with characteristic prudence, he refused to start unless a guarantee of 30,000 francs was made him. This was satisfactorily arranged, and the aviator left according to schedule on the *Touraine*. Thomas R. McMechen, a member of the syndicate, after receiving a cablegram from F. S. Lahm, the foreign representative of the club, stated that he was now assured that the exhibition flights would begin as planned on July 29.

THAT TOLL BRIDGE ACROSS THE CONNECTICUT.

HARTFORD, CONN., July 20.—The Warehouse Point, Windsor Locks, toll bridge has been thrown open as a free bridge, and hundreds of motorists who have been well "stung" for excessive bridge tolls in the past will rejoice at the new turn of affairs. About 20,000 people participated in the celebration at Windsor Locks, Saturday afternoon and evening. Heavy electrical storms prevailed more or less throughout the day, but this did not interfere to any extent with the program. Members of the Hartford and Springfield clubs were present and took part.

NO MUFFLER CUT-OUTS IN NEW YORK.

According to Police Commissioner Bingham of New York City, the muffler cut-outs on automobiles and motorcycles come in the same class as whistles on peanut roasters, ringing of bells by scissors-grinders, and the yelling of "old clothes" men. The nine thousand policemen of Greater New York have instructions to remonstrate gently but firmly with any inconsiderate chauffeur who thus offends the public ear. The ban is also placed on all unnecessary blowing of horns and sirens. Chauffeurs who return to the garage at 2 A.M. must now arouse the watchman in the orthodox way, instead of serenading the whole neighborhood until they gain admittance.

EXCESS LICENSE MONEY FOR GOOD ROADS.

LANSING, MICH., July 20.—Michigan's State Highway Commissioner, familiarly known as "Good Roads Earle," will receive $12,000, collected by the Secretary of State for automobile licenses, over and above the cost of running the license department, to be used in the still further betterment of the highways in the State. Great things are expected from the use of this fund, as it is to be used not for the actual building of roads, but for the expenses of the men who are to be sent to the counties in the State in which the "county good roads system" has not been adopted as yet, on an educational tour to show the farmers the meaning of good roads to them.

HOOSIERS ARE AFTER ROADS AND GETTING 'EM

INDIANAPOLIS, IND., July 20.—The United States Government is doing more to extend good roads work in Indiana than all other associations combined. Estimates of $8,000,000 for road building in Indiana this year will probably be insufficient, for the amount to be expended will probably reach a larger sum.

Before the advent of rural routes, the farmer was more or less indifferent about the condition of the roads. In the last few years, however, he has been buying automobiles and has grown accustomed to having the mail left almost at his door. Recently, however, the Government, through its postal authorities, have been demanding vigorously that roads shall be improved still more. In the vicinity of Charlestown the entire rural mail service threatens to be discontinued because of bad roads and farmers are now projecting the building of forty-one new roads.

In other parts of the State officials and business men are hurrying through road improvements to save rural routes. Madison County is preparing to build twenty-one new roads at a cost of $250,000. At South Bend the Business Men's Association is making special efforts to have good roads built. A few days ago township trustees and road supervisors of three counties met at Peru to discuss good roads. George Allen was elected president and C. F. Davis secretary of a good roads body.

MIDSUMMER DOINGS OF THE AUTO CLUBS

SYRACUSE CLUB IS ACTIVE IN SIGN WORK.

SYRACUSE, N. Y., July 20.—During the past year, the Automobile Club of Syracuse has made an excellent gain in membership, its roster now containing 175 names, which means that it has practically doubled in strength within the past two years. Secretary Forman Wilkinson is about to launch a campaign to recruit the one hundred odd autoists of the city who are not at present affiliated with the club, for to quote him, "They need us as much as we need them." The organization is carrying out so much good work that every progressive autoist should lend it his financial as well as moral support, for every owner of an automobile within a radius of more than 50 miles benefits directly by the club's efforts for better conditions. It is estimated that the number of cars in Syracuse has grown by 50 per cent. within the last year, now totaling something like 350.

A great amount of work has been carried out this summer in placing route and danger signs, the Syracuse club being a pioneer organization in the provision of railway crossing signs. No less than 150 signs of various kinds have been placed in Onondaga county alone this summer and specifications have already been drawn for an additional lot of 75 to be placed in various small towns in this district. The Empire State is sadly deficient in these signs and the Syracuse club is setting an excellent example.

BOROUGH OFFICIALS IN PENN. TRY SPEEDS.

MEDIA, PA., July 20.—Last week several members of the Automobile Club of Delaware county gave President Samuel A. Field, of the borough council, and four other councilmen, a practical demonstration of the meaning of the various speed limits as applied to an automobile. Beginning with the legal borough limit of 10 miles an hour, which was characterized by the solons as a "snail's pace," the driver "hit it up" to 20 per, and showed how the car could be stopped within its own length while traveling at that gait. Then the borough fathers were taken to the Springhaven Country Club, the odometer showing a 40-mile clip at times. The lawmakers were charmed with the performance, especially when the car was brought to a dead stop in 25 feet while traveling at the last-named speed.

The club is doing excellent work in keeping the speed within the limits, all of the members having subscribed to the "honor" plan, agreeing to at all times observe the State and borough regulations. The club has two paid agents constantly on the road warning automobilists against overspeeding. Signs have been posted on the most tempting stretches bearing the legend: "No scorching or speeding through the boroughs."

As a result of the *entente cordiale* between the authorities and the club, Media is becoming a veritable automobile heaven, and the latter can have anything within reason that they want. Appeals for road repairs are responded to instanter, not alone in tbe boroughs but in the surrounding townships.

HARTFORD AUTOMOBILE CLUB IS GROWING.

HARTFORD, CONN., July 13.—The Automobile Club of Hartford continues to expand. Several of the members favor consolidation with the Hartford Yacht Club, making it possible to have a rendezvous at Fenwick, the Sound station of the yacht club. The growth of the club in the past nine months is remarkable. It is quite likely that the 300 mark will soon be reached. A clubhouse is talked of, though that cannot come for a while as yet. The present quarters in the Allyn House have proven very popular and useful for transient motorists who desire some authentic information concerning roads.

The newly formed Automobile Club of Willimantic, near here, is in a prosperous condition, and the membership is gradually increasing. Needless to say, the gain of any individual club means a gain for the Connecticut Association, and this is much desired in order that its scope of influence may be extended.

ANOTHER CUP FOR CONNECTICUT BODY.

TORRINGTON, CONN., July 20.—Twenty-five enthusiastic automobilists of this town met recently to organize the Litchfield County Automobile Club, of Torrington. John N. Brooks was chosen chairman of the meeting, and N. D. Holbrook, secretary. Mr. Brooks briefly outlined the purposes of the club, and later Mr. Holbrook read a communication from E. K. Dustin, secretary of the Connecticut Automobile Association, showing the objects of that organization and what its benefits were. The following officers for the ensuing year were elected unanimously: President, N. D. Holbrook; vice-president, John N. Brooks; secretary, W. P. Norton, Jr.; treasurer, George E. Cole. There will also be four standing committees on good roads, sign posts, membership and rights and privileges. The chairmen of these committees, who, according to the by-laws, was appointed by the president, are F. P. Latimer, J. H. Baeder, F. W. Mertz and Dr. Elias Pratt, respectively. Together with the four officers, they will form the governing board and will have the right to select the other two members of eacb committee.

There are said to be over seventy automobiles owned in Torrington and almost as many more in the surrounding towns. Efforts will be made to persuade all owners in the vicinity to join the club, which will then be affiliated with the Connecticut Automobile Association. The club will also attempt to get rid of several dangerous "thank you marm's" and grade crossings. The next meeting will be held about the first of August.

PENN. LAWMAKERS AND AUTOISTS IN HARMONY.

PHILADELPHIA, July 20.—The "honor" plan of solving the speeding problem in the townships and boroughs roundabout this city gives evidence of proving much more satisfactory than the "iron glove" method. The scheme was first inaugurated in this section by the Norristown club, when the members obligated themselves to faithfully observe all regulations at all times, and to do their utmost to induce others to do likewise, and, failing this, to assist in the prosecution of those who persistently violate the laws. The result has been a separation of the sheep—the club members—from the goats—the "unattached." It has been demonstrated that fully 80 per cent. of the convictions for speeding have been among non-club members.

In the smaller towns especially the scheme is working well. In Lancaster, Norristown, Media, and other places hold-ups by the authorities have become a variety, and in the majority of instances where a motorist is stopped it is found that he is some unattached wight who feels that he is not obligated by any action a club of which he is not a member may take; or else he is a stranger in the land, and is not "wise" to the existing conditions. In the latter case the culprit is usually let off with a reprimand; in the former he gets the limit.

That these "brotherly love" conditions do not obtain in all sections of the country hereabouts is evident from the weekly warning bulletin of the Automobile Club of Philadelphia, which calls attention to traps on the smooth roads between Hulmeville and Oxford Valley and between the latter place and Langhorne. To offset the efforts of the officers, the club has stationed men 100 yards above and below these traps, and will keep them there until the traps are abandoned. If established elsewhere, the club's watchers will follow them, and continue their warnings until the traps are finally abandoned.

AKRON CLUB IN OHIO'S ROAD CAMPAIGN.

AKRON, O., June 23.—The Akron Automobile Club has taken steps to bring about the construction of a paved road from Akron to Cleveland, a distance of 32 miles. The movement is in response to the efforts of the State Automobile Association to have the motorists of this section unite in the general good roads movement now sweeping the State. A paved roadway already exists to Brecksville, some nine miles south of Cleveland.

THE WINNERS IN THE WINTON CHAUFFEURS' CONTEST

THE winners in the $2,500 contest for Winton Six chauffeurs have just been announced and the prizes distributed. First prize was taken by Frank Schneider, driving for Milton Schnaier, of New York, with a record of 11,683 miles in seven months at a total repair expense of $12. The judges were E. E. Schwarzkopf, A. C. Faeh, St. Clair Couzens and M. M. Maxwell. Their decisions were based on monthly reports from the chauffeurs, certified by the owners, and final affidavits from both chauffeurs and owners. Schneider's expense of $12 was not incurred until after his car had run 8,000 miles, and as no other contestant had reached this figure without expense, the judges were unanimous in awarding him first prize.

Second prize goes to Arthur Donovan, chauffeur for J. Axelrod, of New York, who reported a mileage of 7,570, with no upkeep expense.

Harry A. Toomey, of Euclid, O., driving for Harry S. Pickands, won third prize on a mileage of 6,632.9, with no expense. Toomey's original report showed an expense of $284.85, but as this was caused by an accident while the wife of his employer was driving the car, the judges held that it should not be charged against him.

There were ten prizes, ranging from $1,000 to $100. All contestants who drove their cars more than 3,000 miles were awarded handsome gold watches, suitably engraved. It is noteworthy that six of the ten cars finished without any repair expense whatever. This is quite a feather in the cap of the Winton Company, and also shows the importance of having some incentive for the chauffeurs to take proper care of their cars. Such contests teach owners what they may expect in the way of economical upkeep, and should have the effect of making them less lenient in their review of the monthly garage bills, which so frequently contain numerous unwarranted items.

Frank Schneider, Winton Contest Winner, and His Car.

The Winton Company announces that this contest will be repeated in 1909, conditions to be announced later. The table which is appended furnishes the data of the ten prize winners:

Prize.	Amount.	Chauffeur.	Owner.	Residence.	Mileage.	Time.	Average per Mo.	Expense.
First	$1,000	Frank Schneider	Milton Schnaier	New York, N. Y.	11,683	7 months.	1,669 miles.	$12.00
Second	500	A. J. Donovan	J. Axelrod	New York, N. Y.	7,570	3.5 months.	2,162.8 miles.	none.
Third	250	Harry A. Toomey	Harry S. Pickands	Euclid, O.	6,632.9	10 months.	663.3 miles.	none.
Fourth	150	Chas. L. Bonner	Jas. T. Brennan	Brooklyn, N. Y.	6,806	8 months.	850.7 miles.	$3.00
Fifth	100	James Boice	Warren Somers	Atlantic City, N. J.	6,183	7 months.	883.3 miles.	$0.02 1-2
Sixth	100	A. R. Cowperthwaite	Mrs. L. R. Speare	Newton Center, Mass.	6,113.6	4.5 months.	1,358.5 miles.	none.
Seventh	100	Joseph Arnold	Joseph Fish	Chicago, Ill.	5,535	6 months.	922.5 miles.	none.
Eighth	100	James Townsend	H. H. Roelofs	Elkins Park, Pa.	5,415	6.3 months.	856.4 miles.	none.
Ninth	100	G. W. Butler	J. E. Cienny		5,155	3.2 months.	1,628.2 miles.	none.
Tenth	100	E. C. Knapp	E. A. Rooney	Buffalo, N. Y.	4,597	5.5 months.	835.3 miles.	$0.10

Summary.—Ten cars ran 65,687.5 miles in 61 months, averaging 1,076.8 miles per month per car. Repair expense, $15.12 1-2, averaging $1.51 per car; or 25 cents per month per car.

A. L. A. M. TAKES IN A NEW MEMBER.

For the first time in two years the Association of Licensed Automobile Manufacturers has admitted a new member. This was the Chalmers-Detroit Company (formerly the E. R. Thomas-Detroit Company), which was taken in at the meeting on July 17. This action was expected by many, as the Chalmers-Detroit Company had been selling their cars under the license of the E. R. Thomas Motor Company, of Buffalo. The license now granted is an independent one and places it on the same footing as the original members of the Association. The admittance of this company is announced to be mutually advantageous, as the Association will now have in its ranks another low-priced car, the lack of which has long been felt. This action is said to indicate the general policy which the Association intends to carry out, and it is believed to be the first move in a campaign of enlargement.

Roy D. Chapin, the treasurer and general manager of the Chalmers-Detroit Company, was very much pleased by the attitude of the association, and values highly the advantages which will accrue to his company through the new arrangement. The Chalmers-Detroit car will be sold by the licensed automobile dealers throughout the United States, and will exhibit at the Madison Square Garden show to be held next January. Mr. Chapin is very optimistic for next year's outlook.

BARTHOLOMEW 1908 OUTPUT COMPLETED.

PEORIA, ILL., July 20.—The last of two hundred Glide cars, the Bartholomew Company's product for 1908, was completed to-day. Plans are now being made for the season of 1909, and it is the company's intention to market a still larger number of cars than this year. They will continue to use the Rutenber motor, made by the Western Motor Company, of Logansport, Ind. There will be but one model, styled the Model "G" Special. It will have 4 3-4x5-inch motor, with magneto ignition, with a wheelbase of 120 inches, and in its general lines will follow the 1908 model. A roadster will also be built on the same design, except that the wheelbase will be 106 inches, and the steering post will be given a greater rake. This car will be furnished with two types of bodies, one with a collapsible double rumble seat, and the other with a close-coupled design.

On account of the constantly increasing Eastern trade, O. Y. Bartholomew, the present treasurer of the company, has been appointed Eastern manager. He will assume his new duties August 1, with headquarters at Philadelphia. With his personal attention and supervision it is believed business in that section will show a still added increase, as, up to the present, the company has not been in a position to devote the measure of attention to the Eastern trade that the demand for the Glide merited during the past three or four years.

Holsman Model 4—The Latest High Wheeler.

NEW MODEL HOLSMAN MAKES ITS DEBUT.

In order to bring out a car within reach of a much greater number of people, the builders of the Holsman, the Holsman Automobile Company, 444 Monadnock Block, Chicago, have modified the lines of their standard machine and while still maintaining the same design and constructional features throughout, as well as the same grade of materials, have produced what is officially known as the Model No. 4 Holsman runabout. The same power plant is employed as in the high-priced machines, and in many ways it is identical with them; the same high-grade forgings, castings, seamless steel tubing are used throughout. The wheelbase is 65 inches, while any tread from 52 to 62 inches is optional with the purchaser, the car weighing 800 pounds all on. It has a gasoline capacity of 5 1-2 gallons, on which it can cover 150 miles, and is equipped with solid rubber tires on the usual high wheels. In complete running order it lists at $550, the top and side lamps being extra.

Some idea of its appearance may be gained from the photograph of the first one of the new series in the Holsman fold, that tops the head of this column. It is there shown in complete running order, minus head or side lights.

A NEW CAR FOR 1909—THE WOODS.

Walter A. Woods, the general manager and treasurer of the Cleveland Motor Car Company, has resigned his position in that company and will now be at the head of a new concern located in Milwaukee, Wis. A six-story building now under construction on "automobile row" in New York City will be occupied by the new company as their headquarters and will be opened about September 1. Temporary offices have been secured in the Miller building, 1931 Broadway, New York City.

The new car will be of the four-cylinder type of five-inch bore and stroke, and will have double ignition with high-tension magneto and the now popular self-contained oiling system. The change-gear will be of the selective type, four seeeds forward and one reverse, with direct drive on the third speed. The clutch will be the improved Woods design multiple disc, containing 52 metal plates or discs running in oil and inclosed in a separate case. A new feature of this clutch is a form of brake which absolutely prevents the discs from turning while shifting gears, rendering this operation entirely noiseless and eliminating one of the principal objections to this type. The wheelbase will be 122 inches for touring cars, limousines and landaulets, and 112 inches for runabouts, toy tonneaus and town cars. Fully equipped with top, slip covers and glass front, the car will sell for $3,500.

Work on the 1909 product has already been begun, and deliveries will start on or about October 1. The new car will be known as the Woodsmobile, thus identifying it with the founder of the company, who for the past 15 years has been actively identified with the industry.

A. M. C. M. A. MEMBERSHIP ON THE INCREASE.

During the past week three more automobile manufacturing concerns have been admitted to membership in the American Motor Car Manufacturers' Association. They are as follows:,

Holsman Automobile Company, Chicago, Ill.

W. H. Kiblinger Company, Auburn, Ind.

Midland Motor Car Company, Moline, Ills.

The first two are well known as producers of the high-wheeled buggy type of car, of which such a large number are now in use in the West, while the Midland is a touring car of standard construction which is now being turned out by the new company which took over the plant of the former Deere-Clark Company.

MEMPHIS WILL HOLD GOOD ROADS CONVENTION.

MEMPHIS, TENN., July 20.—Draining the swamps and improving the roadways of the lower Mississippi are subjects to be discussed by a convention to assemble here July 27.

In this section of the country swamp drainage is imperative, from a national as well as a territorial standpoint, and the accomplishment will materially lessen the good roads problem now confronting this State. Memphis needs good roads—north, south, east and west—and it is hoped that by concerted effort at the coming convention much may be accomplished.

The automobilists here—500 of them—are not organized. As individuals they are all interested in this movement, but lacking an organization they cannot throw their combined strength in favor of good roads at the meeting.

CONVENTION OF MAXWELL DEALERS.

The main office of the Maxwell-Briscoe Motor Company at Tarrytown, N. Y., was a busy place last week on account of the annual convention of the company's branch-house managers. The first day's session was devoted to reports on business conditions throughout the country; Tuesday the guests went on a "rubberneck" tour through New York, dining that evening at the Café Martin. In a business session following the dinner Mr. Briscoe divulged part of his new selling plan, which he believes will revolutionize the methods of selling automobiles in this contry.

Among those present at the banquet were Benjamin Briscoe, J. D. Maxwell, W. S. Hathaway, New York; P. Chiera, Detroit; T. B. Smith, Chicago; J. W. Willcox, Los Angeles; J. C. Handley, Dallas, Texas; C. G. Bleasdale, Cleveland; C. F. Benzing, Buffalo; C. F. Monroe, Buffalo; T. F. Dunn, Pittsburg; F. J. Tyler, Boston; C. W. Kelsey, Philadelphia; A. R. Gormully, Tarrytown, N. Y.; J. M. Austin, Atlanta, Ga.; E. W. Davenport, Col. K. C. Pardee, and R. Irvin, New York City; F. D. Dorman, Tarrytown, N. Y.; L. W. Hazard, High Point, N. C.; A. I. McLeod, Detroit; F. J. Linz, San Francisco; Ernest Coler, Dobbs Ferry, N. Y.

Maxwell Branch Managers at Their Annual Convention.

NEW MICHELIN DISMOUNTABLE RIM.

Since the first dismountable racing rims came into use for the French Grand Prix of 1906, a few changes have been made in the details of these time savers, but the principle of such well-known makes as Michelin, Continental and Vinet has remained unchanged. As is generally well known, eight or more nuts have to be withdrawn and put into place again in the operation of changing a tire. When a revolver brace, such as is supplied with the Michelin rim, is employed, the operation is not a long one, it being possible to make a change, even under ordinary touring conditions, in the short interval of two minutes.

But two minutes is a long time with automobile races as keenly disputed as they are at present, and the Michelin people have sought to reduce the time to a considerable extent. The new rim, after undergoing long private tests, has been supplied to drivers in the Grand Prix, and will make its first public appearance on July 7 at Dieppe. Instead of eight bolts, there is now one fastening only, and no part whatever other than the rim to be taken off in making a change. With this improved type it is possible for a race driver to change a tire in 30 seconds, as we have proved under actual conditions.

The fixed rim, instead of having the inside edge raised and the outside flush, as in the earlier types, has both inner and outer edge beaded. The dismountable rim bearing the inflated

Single Fastener of the New Michelin Rim.

tire is split, and when in its open position leaves a gap of about three-quarters of an inch. The gap in the face of the rim is covered over by an internal brass lining, the main object of which is to prevent the nipping of the tube when the rim is closed up.

The two ends of the detachable rim are connected by a right and left screw fitting into a steel case riveted to each extremity of the rim. The central portion of the screw bears a worn gear operated by a small pinion within the casing shown in illustration, by the operation of which the two ends are brought together, this contraction being sufficient to bind the dismountable rim on the fixed rim. Immediately above the worm gear is a longitudinal pointer, the object of which is to show what degree of opening or closing has been obtained.

The fixed rim and felloe have had to be cut in order to accommodate the projecting lugs and the worm gearing. The hole goes right through the wooden felloe, but all the moving parts are protected by a sheet metal casing on the inner face of the felloe. Naturally, the outer face of the felloe has had to be pierced also to allow of the insertion of the square-ended bit which operated the gear. This opening is protected by a hinged metal cover, so that when the rim is in position it is impossible for either dust or moisture to settle on the threads or to reach the bearing surfaces of the rim.

The maximum expansion of the rim is just sufficient to allow it to be fitted over the outer edge of the fixed rim. In addition to contracting the rim, the turnbuckle prevents creeping, the opening made on the wooden felloe being just sufficient to

New Dismountable as It Appears on the Wheel.

accommodate the projecting portions. Instead of spaced bearing points as on the earlier type of rim, the two surfaces are in complete contact for their entire circumference, this arrangement considerably increasing the strength of the wheel, which is now completely bound. An ordinary type of long valve is employed, and the usual style of lugs with the short countersunk stems familiar to all users of dismountable rims.

Private tests which have been carried out by the Michelin factory for several months have shown that the rim was fully as strong as the earlier models; the ease of changing is obviously very much greater. It is with full confidence that it is safe and a time saver that it has been offered to all drivers of cars fitted with Michelin tires in the Grand Prix race. The new device will be used for the first time among others by Lewis Strang, the pilot of the American Thomas in the Grand Prix.

INDESTRUCTIBLE WHEELS FOR MOTORCYCLES.

It is evident from the illustration, picturing an Armac motorcycle equipped with Indestructible steel wheels of the type made especially for automobiles, that there is an unlimited field for the application of wheels of this kind for service where the wood or wire-spoked wheel has been universally used up to the present. For motorcycle use, the Indestructible wheels are equipped with Eclipse hubs, and, according to the manufacturers, the Indestructible Steel Wheel Company, 1211 Michigan avenue, Chicago, they have many advantages over the wire wheel ordinarily employed for this purpose. They are not only much stronger and more durable, but their enameled finish is also much more lasting than nickel plating. They are as resilient as a wire wheel and cannot get out of true, while there is no danger whatever of their collapsing, or of obstructions getting through them. Protection is also afforded for the tire valve, and means are provided for locking the valve nuts, so that the tire is prevented from creeping on the rim, even under the most strenuous conditions of high speed traveling over any kind of roads. Their ability to withstand treatment that would ruin a wire wheel should recommend them to motorcyclists.

Motorcycle with Indestructible Steel Wheels.

How the Supply of Fuel Is Assured on Hills.

RAMBLER SUPPLEMENTARY GASOLINE TANK.

Although every automobile manufacturer that has been building cars for any number of years has long since reached a standard of construction for his product that is consistently adhered to, there is always room for improvement in detail. Thomas B. Jeffery & Company, Kenosha, Wis., have found this to be the case, the latest refinement they have added to the Rambler being an auxiliary gasoline tank to insure a supply to the carbureter on hills, particularly where the latter are long, stiff grades. This new auxiliary tank, as shown by the accompanying photograph of a Rambler power-plant that has been fitted with it, is located above and behind the carbureter, and considerably below the level of the main tank. It has sufficient capacity to run the car for several miles on an upgrade and is so arranged that the gasoline will flow into it from the main supply on a level or a slight upgrade, but it cannot empty back into the main supply under any conditions of running. It measures 4 inches in diameter by 10 inches in length.

ONE OF THE MANY RAMBLERS IN MEXICO.

Mexico is proving quite a field for the American manufacturer to develop, as is already evidenced by the rapidly increasing number of cars of well-known makes that hail from across the border as compared with those brought from Europe. The foreign manufacturer has been more progressive in past years in introducing his product to this market, but within the last twelve-month American makers have gained a great deal of lost ground and are now making rapid strides, the winning of the first Mexican road race for the Jalisco cup by an American car over its high-powered foreign rivals showing that American automobiles are built for the roughest kind of roads to be found.

A Native Driver of a Rambler in Mexico.

MAY SHOWS A FALLING OFF IN EXPORTS.

According to the report of the Department of Commerce and Labor for the month of May last, there has been a considerable falling off in the value of the American automobiles and parts sent abroad, as compared with the same month of a year previous. This is principally to be accounted for by the fact that there has been a heavy cut in the English demand as shown by the difference in the figures for the United Kingdom during the two months in question. It is somewhat anomalous to note in the same connection that the American exports to France increased from $85,984 to $100,597 during May, 1908, as compared with May, 1907, while the returns for Germany and other Europe also show substantial increases. For the period of 11 months ending with May in the past three years, the totals are for 1906, $2.957,748; 1907, $4,770,187; and 1908, $4,567,125.

LOGAN SIGHT-SEEING CAR IN COLUMBUS.

During the past year or so one of the most prominent features of the demand for commercial vehicles has been the great number ordered for sight-seeing service. The Logan Construction Company, Chillicothe, O., have found this to be the case with their three-ton Model S chassis, which makes an excellent car of this type, as will be evident by the accompanying photograph of one of them that has just been supplied for service in Columbus, O. There are six seats back of the driver's, each of which is 6 feet wide and is designed to accommodate five persons. The tire equipment consists of 36 by 5-inch solids front and 36 by 3 1-2-inch twin tires on the driving wheels. Steering is made easy by the use of Timken roller-bearings in the steering knuckles. The gears of the change-speed gear-set are all of Krupp chrome-nickel steel, while the shafts are vanadium steel. The car shown was run from Chillicothe to Columbus, a distance of fifty-one miles, in about five hours. It is designed for a maximum speed of twelve miles an hour, but the roads were not in shape to permit of this.

Logan Truck Built for the "Rubberneck" Business.

STANLEY STEAMERS QUIT RACING.

Announcement was made yesterday by W. J. Morgan, secretary to the trustees controlling the Sir Thomas Dewar international mile trophy, that the Stanley Motor Carriage Company had returned the cup with the statement that they were out of racing. The contest for the trophy was not held at the Ormond-Daytona meet this year, as usual, because the rules adopted by the trustees were at variance with those established by the A. C. A. There was some talk of a match between the twelve-cylinder Maxwell racing car and the Stanley, but that, of course, will not now take place. It is possible, however, that a race for the trophy may be held some time this summer, if a fast mile straightaway course can be secured.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

Otto Holler, manager of the Paul Thomann Machine Company, Duesseldorf, Germany, Hansahaus No. 155, is interested in the representation of a small and cheap automobile for business and touring purposes, and will be glad to have catalogues and all particulars from prominent American firms.

Owing to a transposition in make-up in last week's issue of THE AUTOMOBILE, on page 99, the P. & S. Skimabout was given second place in the summary of the Arrowhead hill-climb, in the $1,251 to $2,000 class. The P. & S. Skimabout won the contest, and its time was :294-5; not :494-5, as printed.

E. R. Stockwell, Mechanicsburg, O., agent for the Reliable Dayton, accompanied by W. E. Sanger, also of that city, drove a Reliable Dayton type "E" to the Chicago factory and return last week, spending two days on the road each way and two days traveling about the vicinity. The total distance covered was 834 miles, an average of 139 miles per day. The longest day's trip was 209 miles.

For several years John D. Rockefeller has owned a White limousine and has taken a daily outing in it, no matter where he was staying. A few days ago he bought another White, but this time with a touring body. The supposition that Mr. Rockefeller intends to do some cross-country touring is strengthened by the fact that he has written to the touring bureau of the White Company asking for a set of White route books and making inquiries about State licenses.

The last car of the Winton Six-Teen-Six output has left the factory, and is now on its way to Wm. R. Hearst. It is fitted with a handsome landaulet body finished in maroon. Delivery was delayed until this time owing to Mr. Hearst's absence in Europe. The Winton factory has been at work for several weeks on the 1909 output, which, as has been already announced, will consist of six-cylinder cars exclusively. Details of the company's plans for 1909 will be announced August 1.

The Ventilated Cushion & Spring Company, Jackson, Mich., through their attorneys, Rummler & Rummler, have just brought an action against Frank D'Arcy, of Kalamazoo, in the United States Circuit Court for the Western District of Michigan, to uphold what is known as the Stott's patent on springs of the type usually employed in automobile work. The special feature of the latter that is covered by the patent in question is an auxiliary or supplementary spring constrution. The suit also protects the rights of the Jackson Cushion Spring Company, as licensees.

When the Y. M. C. A. relay runners carrying Mayor McClellan's message from New York to Chicago reached Syracuse, N. Y., the H. H. Franklin Mfg. Co. loaned three of its motor trucks to carry the spare runners. At 8:15 Thursday evening the silver tube containing the message was passed from the last Rome runner to the first Spracuse boy, in front of the Syracuse Y. M. C. A. The Franklin trucks, loaded with the runners, followed close behind, and at the end of every four minutes, or sooner if necessary, a fresh boy leaped from the truck, grasped the message, and sped on his way. The trucks took the boys as far as Auburn, where the message was delivered to the Y. M. C. A. of that city.

NEW AGENCIES ESTABLISHED.

The Philadelphia agency for the Clammers-Detroit has been placed with the Bergdoll Motor Car Company, Broad and Wood streets, that city.

The Pardee Motor Company, 1229 Michigan avenue, Chicago, has been appointed agents in that city for the Oakland, made by the Oakland Motor Car Company, Pontiac, Mich.

E. P. Moriarty & Company has been appointed agents in Kansas City, Mo., for the new Chalmers--Detroit. It is likely that western Missouri and Kansas will be included in the territory represented.

The Philadelphia Auburn agency, at 441 North Broad street, has just completed arrangements for the establishment of subagencies at Reading and Orwigsburg. The former will be in charge of D. M. Sohl; the latter of R. E. Yeager.

The Morrison & Price Company, Boston agents for the Rainier, Mora and Wayne cars, has just been appointed the representatives at the Hub of the New Everett, to be manufactured by the Verett-Metzger-Flanders Company, of Detroit, Mich.

The White Company has opened a branch office at Minneapolis, in charge of John F. Toole. Mr. Toole states that his company has felt for some time that their line of customers in Minnesota territory were entitled to the service which a branch guarantees. A completely equipped shop in which White mechanics only are employed has been started.

PERSONAL TRADE MENTION.

L. D. Mack has just been transferred from the New York branch house of the Packard company to act as assistant to A. T. Fuller, Boston agent for the Packard.

Arthur Moore, who has been connected with the passenger department of the Erie Railroad, has joined the sales force of the New York City branch of the Firestone Tire & Rubber Company.

Harry Fosdick of the Hol-Tan Company, of New York City, is taking a vacation of several weeks for rest and recreation. Most of it will be spent at Lake Winnepesaukee in New Hampshire.

A. B. Henley, for some time connected with the New York branch of the H. H. Franklin Manufacturing Company, of Syracuse, N. Y., has been made permanent manager of the Franklin branch at Boston.

Former Manager A. J. King, of the Philadelphia Studebaker branch, has joined the selling force of the Quaker City Automobile Company. He will have charge of the Peerless department of the company.

J. C. Zimmerman, for the past two years head of the sales department of the Western branch of the Fisk Rubber Company, of Chicopee Falls, Mass., has just been appointed manager of the Chicago branch of that company.

Walter S. Shawvan, who has been connected with the Chicago branch of the Locomobile Company, has joined the sales force of the Schreiber Motor Car Company, Milwaukee Locomobile agent.

William Stegeman, who has been considered for years by the western motor car makers as one of the prominent factors in the development of automobiles, has just joined the forces of the Palmer & Singer Manufacturing Company as chief engineer.

W. Wayne Davis has been appointed manager of the new branch of the Matheson Motor Car Company which has just been opened at Broad and Green Streets, Philadelphia. Mr. Davis was formerly connected with the Quaker City Automobile Company.

H. E. Butcher, formerly of the H. E. Butcher & Company, manufacturers' agents, with offices in the Stevens building, Detroit, has accepted a position with the Timken Roller Bearing Axle Company as traveling salesman. He will make his headquarters at Detroit.

F. H. Sanders, for several years the Franklin demonstrator and salesman for Adams & Hart, Grand Rapids, Mich., and recognized as one of the best automobile experts and salesmen in that section, has been employed as field salesman for the H. H. Franklin Manufacturing Company.

T. E. Hamilton, who has been acting as sales manager for the H. C. & C. D. Castle Company, Boston, has severed his connection with that concern, and has been appointed New England agent for the Haviland Oil Company. F. B. Armington will be associated with Mr. Hamilton, and they will open up on Boylston street.

A. A. Ledermann, for four years assistant engineer of the George N. Pierce Company, of Buffalo, has resigned his position with that company, to go into business for himself. Under the firm name of the A. A. Ledermann Company he will be located in a new garage at Utica, N. Y., and will have the agency for the Pierce-Arrow in central New York.

Ernest H. Braudt, formerly sales manager for the Corbin Motor Car Company, has been appointed Eastern manager for the Cadillac Company, with headquarters at 1649 Broadway, New York City. The company has taken the Mineola stable, at Columbus Circle, which will be remodeled for their use, and which they intend to occupy about October 1.

George C. Hubbs, for many years advertising manager for the Morgan & Wright Company, Detroit, Mich., has handed in his resignation, to take effect August 1. He will then be associated with the Long-Critchfield advertising agency in Chicago. No successor to Mr. Hubbs will be appointed, as he will continue to look after the Morgan & Wright advertising in his new position.

Charles L. Stevens, formerly manager of the Hartford Suspension Company, has just been appointed the Eastern sales manager of the Midland Motor Company of Moline, Ill., and is now located in New York, making his headquarters at the Allenhurst Garage, the New York home of the Midland. Mr. Stevens has recently been connected with the Matheson Auto Company of Denver.

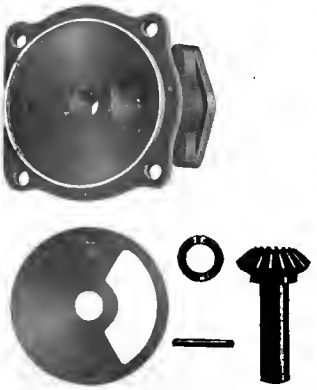
Harry L. Owesney, who has been acting as assistant manager of the San Francisco branch of the Winton Company, has been appointed manager in place of Charles M. Brown, who has taken the management of the New York branch of the company, while W. L. Duck, who was the former London manager of the Winton Motor Carriage Company, has been appointed manager of the Baltimore branch of the company, vice R. L. Williams, who resigned.

INFORMATION FOR AUTO USERS

Willet Motor—This represents a departure from current practice in this country, in that it is a two-cycle type of internal combustion motor fitted with a rotary inlet valve, the latter being water-cooled. It is the product of the Willet Engine and

SECTIONAL VIEW OF WILLET MOTOR.

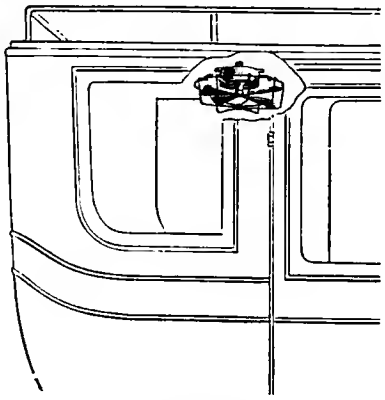
Carbureter Company, 764 Ellicott Square, Buffalo, N. Y. The cylinders are cast in pairs, and are made from the finest grade of gray iron, containing a percentage of Bessemer steel. The exhaust ports are so arranged that there are no sharp turns, thus eliminating any back pressure in the cylinders. The pistons are of the same material, and are fitted with four rings; they are of the Mercedes type, and, owing to their extreme length, they insure long life to the motor. Connecting rods are steel drop-forgings, fitted with cast-iron



DETAILS WILLET ROTARY VALVE.

bushings on the piston pin and interchangeable nickel babbitt bearings on the big ends. The two-cylinder motor has three bearings of open-hearth steel, ground on all surfaces. The crankcase, which is of aluminum, carries the gear case and the rotary valves. These gears run on annular ball-bearings, are marked to insure the proper timing, and are easily removable for inspection. Where the rotary valve is concerned, the valve housing makes the seat for the valve, and is cast of bronze. The valve itself is cast-iron, and is self-grinding and adjusting. It is driven by miter gears, and permits a full charge to enter the crankcase, regardless of the engine speed, making the motor extremely flexible. Thermo-siphon circulation is employed, while dual ignition using a high-tension magneto is fitted, a mechanical, gear-driven oiler taking care of the lubrication. The Willet motor is made in sizes ranging from 8 to 70 horsepower, all being properly counterbalanced, so that they run very smoothly at any speed.

Limousine Electric Fan.—The Motor Car Equipment Company, 1727 Broadway, New York, is introducing an electric fan designed for use in limousines. The motor is adapted to run on the current of an



LOCATION OF LIMOUSINE FAN.

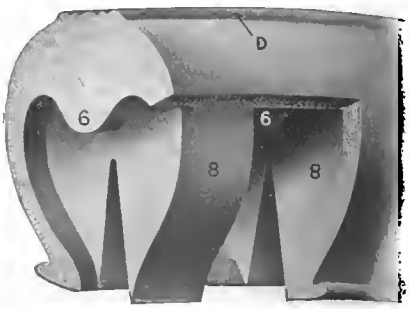
ordinary 6-volt ignition battery. The fan is intended to be placed in the roof of the car, and, being very powerful, keeps the air inside always cool and fresh. The interior of limousines and other closed cars is so apt to be hot and stuffy during the summer that this innovation will certainly be welcomed.

"Klaxon" Warning Signal.—According to the makers of the Klaxon, the Lovell-McConnell Manufacturing Company, 361-365 Market street, Newark, N. J., a musical note does not penetrate or command. It is the discordant note that dominates, and the Klaxon is guaranteed to produce the most startling discord ever heard. The device is electrical in action and is operated by a small electric motor and battery, commanded by an ordinary push button. On the end of the motor shaft is a toothed wheel that rubs across a knob fastened to the steel disk or diaphragm, the vibration of the latter producing the sound. The Klaxon can be easily applied to the right or left hand side of a car and the operation of installing it is very simply and easily carried out. It is manufactured under the patents of M. R. Hutchinson, and C. S. Knowles, 5 Arch street, Boston, Mass., is the sole distributer.

Dayton Airless Tires.—The ideal tire would seem to be the one possessing all the good features of the pneumatic and the solid rubber tire without the bad features of either, and this is something the Dayton Rubber Manufacturing Company, Dayton, O., think they have in the Fawkes tire, which was first placed on the market in 1906. It is of the non-inflated, punctureless type, and according to the makers, it more nearly meets the requirements of automobile work than any of the kind yet devised. When it first appeared it met with a very large demand and the plant could scarcely keep pace with the orders, but internal

SECTION DAYTON AIRLESS TIRE.

troubles, ending in the disruption of the firm, caused a loss of the success thus achieved through the long delay involved in litigation. The Fawkes patents became the property of one of the officers of the company, who is now the general manager of the Dayton Rubber Manufacturing Company. In the two years intervening large sums have been spent in tests and experiments, with a view to improving the Fawkes tire, and the result is known as the Dayton airless tire, which is illustrated herewith. It is now being manufactured under a number of new patents by the above company. Its construction will be apparent from the sectional view, showing that the columns of rubber are made of different sizes and strengths, and are placed at various intervals according to the load the tire is designed to carry, the factor of strength having been carefully computed and tested. A report by C. F. Adamson, M. E., shows the deflection or resiliency of the Dayton airless tire to be about 10 per cent. greater than that of a pneu-



METHOD OF REINFORCEMENT USED.

matic under the same load conditions, the vibration being the same. Nothing but the best of materials worked by modern machinery are employed, the durability of the tires having been proved by the experience of hundreds of users of the Fawkes tires, which have stood up for 20,000 to 30,000 miles. Various types of treads are made to fit either standard clincher or quick detachable rims.

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THE AUTOMOBILE

WHAT THE BIG TOUR TOLD IN RELIABILITY

FORTY-SIX cars started from Buffalo, July 9, in the memorable 1908 tryout, known as the "Fifth Annual Reliability Touring Contest of the American Automobile Association." Thirty-two of these cars were of touring variety, and fourteen belonged in the runabout class. At Saratoga, N. Y., July 23, there were twenty-three surviving clean-score touring cars and five runabouts—a remarkable conclusion of a remarkable test.

As if the 1,675 miles' journey were not sufficient to determine beyond question the reliability of American cars, the five tied runabouts are now being driven once more over the course, in an effort to evolve a winner of the Hower trophy.

Furthermore, if it had not been for a combination of circumstances the three touring car teams would also have participated in a renewal of the journey. But one team was prevented from so doing by the business duties of a member, while another trio declined to accept the special committee's decision regarding a protest, the details of which are hereinafter stated. This left a single team of the three tied trios, and, after reporting for an official start on the morning of July 24, it formally withdrew, declining to win unopposed, and, therefore, the Glidden trophy returns to the custody of the touring board of the American Automobile Association as its official depository until next year.

The automobile-buying public, which had followed closely the progress of the contest, was inclined to regard the run-off with mere curiosity, and, perhaps, some wonder that the interjection of prize trophies should have made it necessary to carry the test to so merciless a conclusion, in order to decide this point.

The wonder of the demonstration of the fitness of American cars of all types, powers and prices to negotiate such highways as the States provide, under such abnormally strenuous conditions as were set by the rules, grows with contemplation and analysis of the results. Nothing like it has ever preceded.

A "perfect score" meant the maintenance of a time schedule that but once was as low as 17 miles and but once as low as 18 miles an hour, in both cases over the roughest of water-break abounding mountain roads, and during the other ten days ran from 19 to a fraction under 20 miles an hour, the legal speed limit at all times being regarded by the schedule makers. It meant that during the run no replacements could be made of parts not carried and catalogued on the list given the committee, and that all adjustments, replacements and replenishment of fuel should be made on tour without allowance in the time schedule. None was possible outside the run, for all cars were placed under guard from the checking in at night until the checking out in the morning, so that the cars could not be touched.

Yet for twelve days the cars had battled with the worst roads the Middle and New England States had to offer, in a run of 1,675 miles, furnishing an average of close to 140 miles a day, a touring proposition that even the most enthusiastic voyagers-a-motor would hesitate to undertake simply for pleasure purposes.

Pennsylvania furnished two days of rough going through the Alleghenies and added a third in the Delaware Water Gap region, that meant bumping the bumps and chug-chugging up grades that put frames and motors to as cruel a test as the East can furnish. New York gave good roads most of the way, and so did Massachusetts. Maine, New Hampshire and Vermont, however, were penetrated to their picturesque wilds. The Poland, Rangeley and Bethlehem district highways, to put it

Typical Scene of the Big Tour—This Was at Poland Springs in Maine, Where a Night Stop Was Made.

mildly, were not built for "joy riding." Then came the wind-up run of 184 miles to Saratoga, on a 20-mile-an-hour schedule. It embraced a scramble over the Green Mountains that put even the run in and out of Bedford Springs in the shade for knock-out qualities. Here were water-breaks that could not be "one—two—three—foured," and furnished sheer drops of from two to three feet. If any part were weak from long pounding there would have been no escape for it.

The conduct of the tour was businesslike and effective. Chairman Hower was courageous in carrying out rules, and rendered his decisions promptly, without any diplomatic attempts at glossing them over by roast-saving compromises or diplomatic soft-soap. It was particularly noticeable on this tour that his decisions carried with them no conspicuous aftermath of dispute and argument, and there were few penalization points at which any pretense of protest was made. One highly important question, and, in fact, the crucial one of the tour, was left by the chairman to the officials, owing to its affecting his own club and incidentally a maker to whom he was indebted for the use of his pacemaking car, and this constitutes the one jarring note.

Facts Relative to Protest Are Conflicting.

The facts relative to the protest are conflicting in not a few respects, but sufficiently congruous to make it certain that there only could be in the realm of equity one decision.

Immediately after checking out Thursday morning, at Bethlehem, N. H., J. W. McGuire stopped when one-half mile from the checking station to take off the tire chains. Two men were on the job, and the utmost dispatch used. The chains, without wait, were tossed into the tonneau and the car was off in hot chase of the chairman's pacemaking machine. Nothing more was said of the matter by observer or driver. The car waited in line at Saratoga one hour to check in, there being no intimation on the observer's part that 3 minutes should be added to the car's running time because of the time lost taking off the tire chains, and nothing was said of this time by the observer before checking in. Immediately after checking in, the observer made up his report card, recording the three minutes' time lost. Driver McGuire signed it, and, immediately after signing, noted the 3 minutes recorded. He at once protested, claiming that the time spent in removing the chains was less than one minute, which would not affect his checking in because of the two minutes' leeway permitted. The observer claimed he took the time accurately, from the time the car stopped until the time it started again, and for this was censured by Chairman Hower, because observers were explicitly instructed to take the actual time required on the tire work, and not the time from the stopping of the car until it started on the road again. Much talk was heard because of the observer not having made out his report until after the car crossed the checking line. McGuire made a mistake in not asking the observer immediately after the chains were taken off as to the amount of time consumed. It was not obligatory on the observer to give this time without being asked, as his duties were simply those of observing and recording his observations.

Both Driver and Observer at Fault.

In commenting upon the decision in which the Pierce car was given a clean score, Chairman Hower dwelt on the fact that the car waited in line for over one hour, and that no work was done on the car during that time excepting to fill with gasoline and oil. The contest was not one of watches, but of cars, and it was not the spirit of the rules to throw out a perfect-score team because of a dispute in which it was apparent both driver and observer were at fault.

Earlier in the run penalties were thrown off other makes of cars on technical grounds. One Oakland had 2 points removed which were imposed for having a person other than the driver and mechanic pour water into the radiator. The car was by the roadside. R. M. Owen had bought a pail of water for 60 cents and only required a part of it. He asked anybody else if they wanted what remained, and, being answered in the positive, proceeded to empty the remaining contents of the 60-cent pail into the Oakland radiator. The rest is known. The observer, faithful to duty, recorded it and the chairman at first imposed the 2 points, but later a sensible interpretation removed the points. On the first day of the tour three or four cars crossed the line ahead of time, but the penalties were removed.

Only One Day without Penalties.

Of the 12 days of the tour there was only one in which not a car received a penalty, that blissful day being the ninth out, or the run up the ocean side from Boston to Poland Springs. Perhaps it was the two days of resting in Boston, coupled with the exceptional entertainment offered, that was responsible for the only clean day of the run. Certainly it was not the roads because in places there were trails through forest land where recent forest fires had destroyed the timber on either side, and at other times sharp jutting stones threatened tires, springs, and axles. Not a few of the cars took big chances on broken culverts and sharp turns, as well as with deep sand, but in spite of it all the cars were victors.

The worst day was "Black Monday" of the run from Bedford Springs to Harrisburg over the mountains and six cars received penalizations, in all 1,696 points being lost on the day. The evils of the day were not altogether responsible for the heavy toll; rather the previous Saturday climb from Pittsburg to Bedford over the Alleghenies weakened a few of the machines, and the second day of mountain work completed the breakdown. The remaining 10 days of the tour were about equal in the penalty score, although the toll was heaviest at the start.

In all twenty-seven penalizations were imposed, which does not mean there were twenty-seven cases of defects, as it often happened that a car broke a spring one day and was penalized points for being late in arriving, and the following day the car withdrew as a contestant, preferring to put in a new spring and take the full 1,000 count. This condition shows up as two penalties, when in reality it is but one. Eliminating all cases of this, there were but twenty-one cases of troubles in the twelve days of the run. Of these three were cases of wheel breaking, the offenders being Van Tine's No. 29 Garford, Jones' No. 25 Studebaker, and Clark's No. 22 Marmon. Three went out through springs breaking, No. 32 Selden, No. 12 Franklin, and No. 106 Franklin. In addition to this were a few other cases of spring troubles: Frank Nutt broke a leaf and the No. 28 Oakland broke every leaf of one spring on the third last day, but was able to continue without replacement until the end of the tour. Two cars were eliminated because of cracking cylinder castings: No. 102 Moline went out when 3 miles out of Harrisburg, the casting of one pair of cylinders breaking, due to a too thin portion in the wall between the waterjacket and the cylinder bore. The car was run to Philadelphia on two cylinders, at which point a new casting was put on. Howard Marmon broke a cylinder casting the last day and had to withdraw.

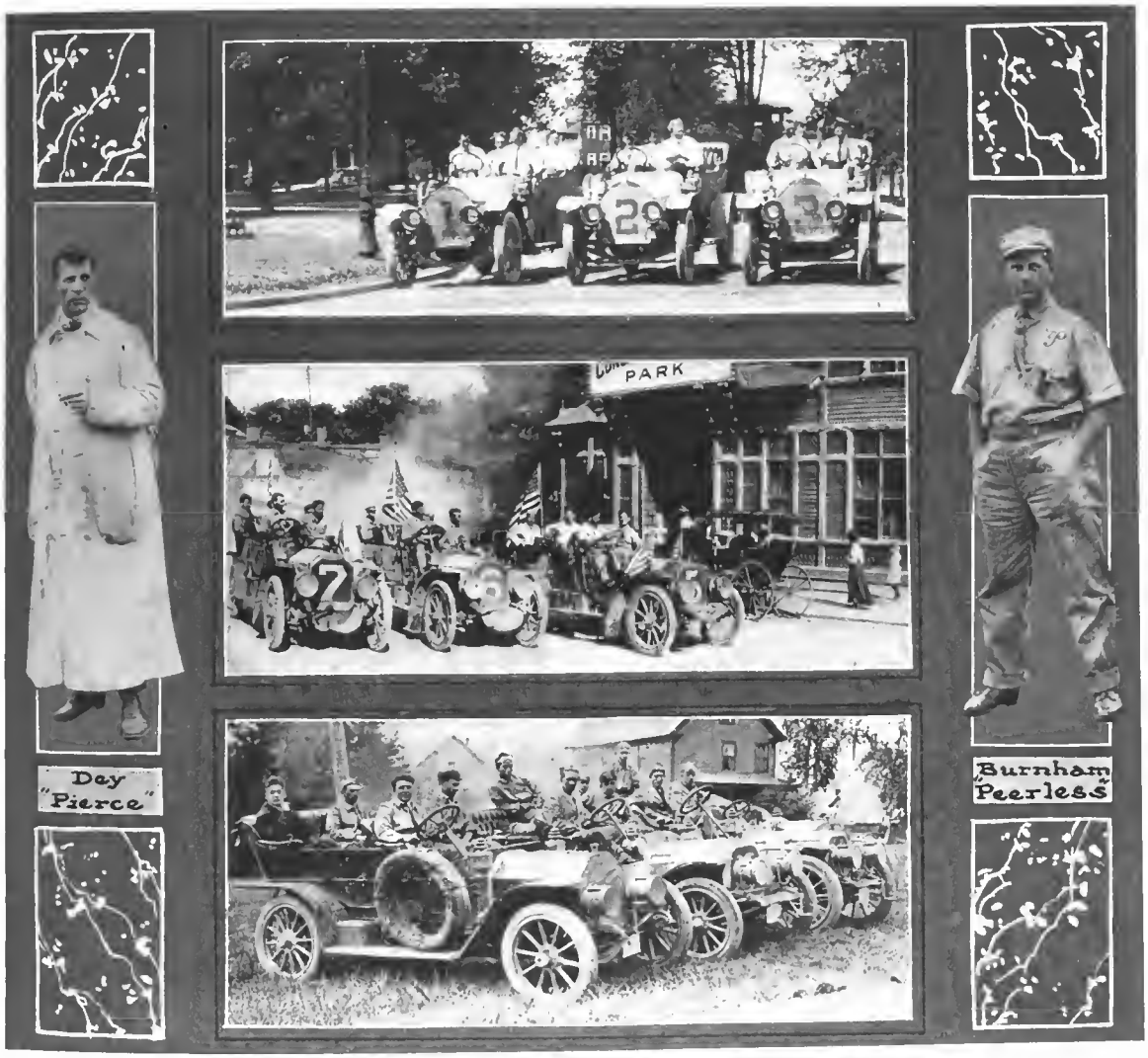
Repairs Were Accomplished Skilfully.

There were three or four cases of rear axle trouble. Hurlburt broke the drive shaft in the rear axle of his No. 31 Garford on the third day out and lost 8 points by using a new one; No. 111 Overland broke a rear axle leaving Pittsburg, but a new one was made in a blacksmith shop and the car finished the run. Owen's No. 4 Reo struck a hole too severely the second day out and had to straighten a back axle, which ran through the tour without any more attention and in good shape, there being no evidence that anything had ever occurred; and another of the Overlands broke a rear axle on the second last day's run, due to skidding when giving the road for a contesting car to pass. The No. 18 Gabriel horn Oldsmobile skidded into a stone on the second last day of the run and sprung the axle driver shaft. It was repaired in a blacksmith shop in a few minutes, after which it was impossible to detect anything wrong with the wheel or the smoothness of the car's running.

Few parts of the cars were watched more closely than the back axles, and it is one of the pleasing comments of the tour that they stood up so well. There were three cases of truss rods supporting the axles breaking, but all of them were speedily repaired. But one case of frame trouble arose, that being the No. 110 Overland that was ditched on the run to Harrisburg and cracked the left side frame member midway of the axles. The driver and mechanic in a blacksmith shop made a repair that lasted in perfect shape until the car reached Saratoga. Transmission troubles were practically eliminated, there being only three cases of such and all of minor importance.

ing knuckle, the car striking the curb so hard that the wheel was forced almost under the car. The replacement was made in an hour or so, and the car finished the tour without any further trouble. No. 28 Oakland had trouble twice with its straight tubular front axle, caused primarily by the driver taking the water breaks straight head-on, so hard that the tonneau passengers were nearly thrown out at times. The axle was taken out and reset; later it gave way and an improvised truss rod was used.

How many of the cars behaved is best gleaned from information given by drivers of many cars upon their arrival in Saratoga, and which information in not a few cases was borne



The Trio Numbered 1, 2, 3 Is the Pierce Team; 5, 6, 7 Are the Peerless Trio, While the Lower Picture Consists of the Oldsmobile and the Two Haynes Cars. The Pierce Team Represented the Buffalo Club; the Peerless, the Columbus Club; and the Mixed Team, the Chicago Motor Club.

Record exists of only one case of brake trouble, that being the seizing of one brake on No. 22 Marmon when the brake was too hurriedly applied at a water break. The brake seized not because of faulty design, but due to the bearing for the expanding cam becoming loose and allowing the cam to lodge crosswise between the shoes so tightly that the wheel had to be taken off before the cam was properly positioned. Front axle troubles were few. No. 9 Premier ran into a curb on the sharp turn entering Kingston and broke the hub bolt of the left steer-

out by the testimony of observers. No. 35, Oldsmobile, had six tire punctures, used one new casing, did not make a single motor adjustment or brake adjustment, and broke one spring shackle bolt, which was replaced by one of the driver's manufacture, without penalty. This car took on about four gallons of water on the entire run, showing the efficiency of its cooling system.

Teddy Dey's Pierce had a brake adjustment as its only alteration. Arthur Kumpf made a brake adjustment and added a new casing. The story with the Pierce and Peerless machines, which

was recorded in these pages last week, remained unchanged. No. 14, Franklin, did not make an adjustment of any nature, had only one puncture, but not a blowout, and did not need a new casing. Harry Hammond's No. 8, Premier, went through without a single adjustment other than one on the brakes, and used but two new casings. The two Stevens-Duryea machines traveled with particularly little tire difficulties. Driver Clark of No. 17 had but one puncture, and the observers reported very little use of the brakes on this car in the mountain work, the driver controlling the machine when going downhill by the motor.

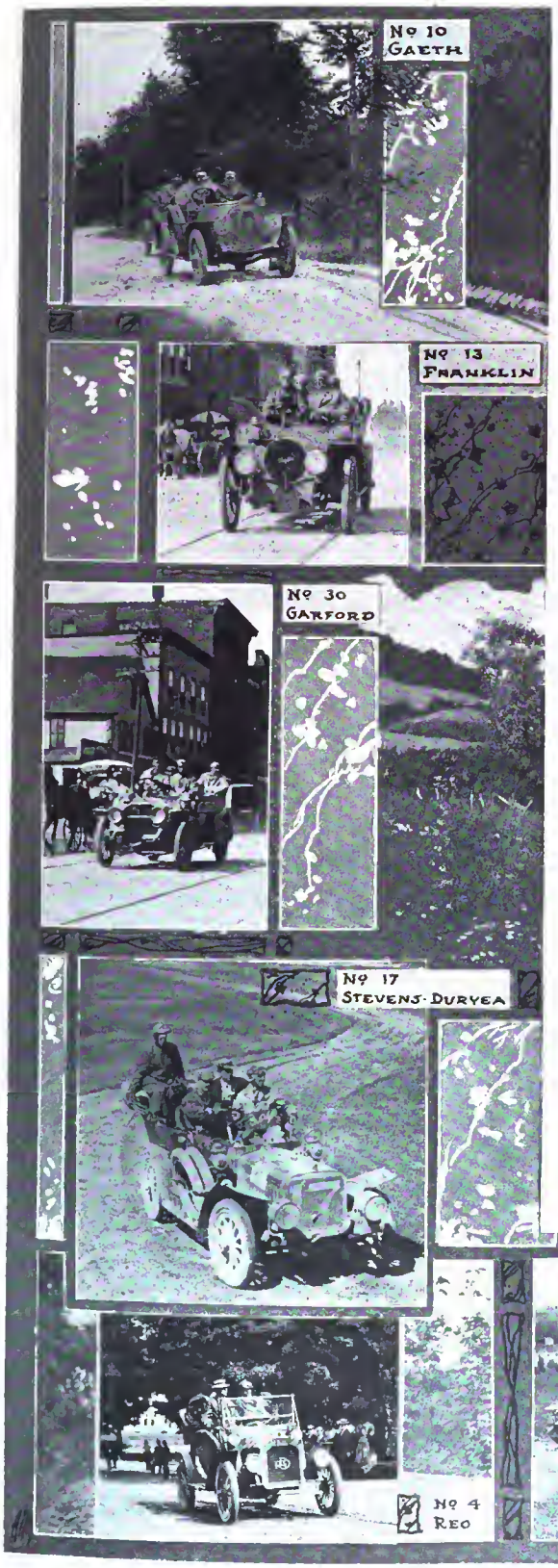
The two-cylinder Reo cars and the two-cylinder Oakland machines astonished a great many of the four and six-cylinder enthusiasts on the run. Before leaving Buffalo many of the tourists predicted they would never reach Pittsburg, but all four of them were on hand ahead of time at Saratoga, and not one of them took the 1,000 count, either. In fact, Lockwood's Reo and No. 28, Oakland, have a unique record, being the only two cars to receive penalization and not to withdraw. Lockwood's carried 12 points and the Oakland 58. It was remarkable how these little machines performed in mountain work, and the manner in which they took grades on the high speed. Both of the Reos were excellently handled by Owen and Lockwood, and the cars were in as good shape and running as well at the completion of the tour as at the start. The Oaklands were not so well handled, and No. 28 received all of its penalizations for reckless driving over water breaks. The other Oakland received better care, and went through in good shape, and without a point against it from the start to the finish at Saratoga.

As previously stated in these columns, radiator troubles were noted in a great many cases, and continued until the end of the tour. Radiators leaked near the base plates, and every job of soldering sufficed but for a day or more, when the water would be running out as bad as before. The cause was more with the radiator support than with the radiator construction. From a careful analysis the trouble can be avoided to a great extent by the use of a heavier transverse member of the frame in front of the engine as well as a more flexible method of support.

Fenders stood up remarkably well, and in the majority of cases rear fenders are attached sufficiently far from the wheels so that when tire chains are used they do not rattle against and wear out the fenders. Only two cases were noted where holes were worn in the fenders because of the tire chains hitting them. Last year many fenders were put entirely out of commission. This year only the Studebaker, that hit the bridge and tore off the right front fender, finished so dilapidated. The wrapping of springs was practised by a great many contestants, and proved most efficacious, not a case of springs so wrapped being broken. Shock absorbers gave a much better account of themselves, but the flexible shafts of the speedometers gave a little trouble, although 100 per cent. better than a year ago. Lamps and horns stood up well, and other accessories showed little evidences of the hard usage that was only too evident last year.

Ready to Start on Another Run.

In fact, looking over the cars as they stood in line waiting in front of the Grand Union Hotel, at Saratoga, to check in, made



everybody proud. The cars were in good condition, and looked more as if they were waiting to start out on a 2,000-mile run than after having actually finished such a test. The wheels were straight, mud aprons were tight, axles were in line, bodies were good, and every motor was hitting regularly on all of the cylinders. It was a supreme moment for American cars when, after 1,700 miles of running, twenty-eight of the original forty-six came in with perfect scores, and all but six of the cars that started were on the road and finished the tour. To the European with his fine roads, this might not be considered a great performance, but over American roads it is a truly great achievement, and one which speaks volumes for the American makers who had confidence that their cars could stand the test.

This year's Glidden deserved double, in fact, triple the entries it received; next year's run will be a winner, when more than one hundred cars should be lined up for the fray. Already many of the makers this year have signified their intentions of being on hand in next year's event. The Moline interests, that were represented by one car this year, will be in with a team next year. Franklin, that had a little spring trouble, due to not using shock absorbers or wrapping the springs, will be back next year with a team. It is certain the White people will have a team or so; other newcomers will be on hand; all of the old-time supporters who have now been in for several seasons will be on hand; and the 1909 tour through the West will, according to present prospects, be the biggest motor demonstration that America has ever seen. D. B.

PERFECT SCORES OF FIFTH A. A. A. TOUR, 1908.

Touring Cars.

No.	Car	H.P.	Entrant	Driver	Club
1	Pierce Arrow	Chas.	Clifton	"Teddy" Dey	Buffalo 1
2	Pierce Arrow	Chas.	Clifton	A. Kumpf	Buffalo 1
3	Pierce Arrow	60	J. W. Maguire	J. W. Maguire	Buffalo 1
5	Peerless	30	E. H. Parkhurst	Chas. Burman	Columbus
6	Peerless	30	E. H. Parkhurst	W. C. Straub	Columbus
7	Peerless	30	E. H. Parkhurst	H. D. Savage	Columbus
19	Haynes	40	F. H. Nutt	F. H. Nutt	Chicago 1
20	Haynes	30	C. Wagoner	C. Wagoner	Chicago 1
35	Oldsmobile	40	F. L. Smith	A. Auble	Chicago 1
13	Franklin	42	J. Wilkinson	C. Harris	Syracuse
14	Franklin	42	F. H. Stillwell	H. S. Bate	Syracuse
16	Stevens-Duryea	35	J. F. Duryea	C. C. Smith	Springfield
17	Stevens-Duryea	35	I. H. Page	I. H. Page	Springfield
21	Marmon	50	F. E. Wing	F. E. Wing	Bay State
24	Studebaker	30	E. V. Stratton	W. H. Yeager	Rochester 2
26	Studebaker	30	E. V. Stratton	B. P. Yeager	Rochester 2
4	Reo	18	R. M. Owen	R. M. Owen	Buffalo 2
8	Premier	30	R. M. Owen	H. L. Hammond	Buffalo 2
10	Gaeth	35	P. Gaeth	P. Gaeth	Rochester 1
11	Thomas	70	G. G. Buse	G. G. Buse	Rochester 1
15	Rainier	50	Mrs. Cuneo	Mrs. Cuneo	Chicago 2
27	Oakland	20	J. B. Eccleston	H. Bauer	Chicago 2
30	Garford	40	A. R. Davis	G. Stevens	Cleveland

Runabouts.

No.	Car	H.P.	Entrant	Driver
100	Pierce Arrow	40	R. D. Garden	J. S. Williams
103	Pierce Arrow	40	Chas. Clifton	E. A. Rettling
104	Premier	30	G. A. Weidley	G. A. Weidley
107	Stoddard-Dayton	15	G. P. Moore	G. P. Mooro
112	Stoddard-Dayton	15	R. G. Cox	R. C. Shirk

PIERCE RUNABOUT NO. 103 WINS THE HOWER TROPHY

PITTSBURG, July 29.—The two Pierce runabouts left here this morning for Bedford Springs, and to-night a conference will take place as to a continuation of the tie, in case neither car loses points to-day.

The following letter was this morning handed to E. C. Ferguson, official tour representative, and practically explains itself:

"With the elimination of our most esteemed and worthy competitor, a situation presents itself, which, together with other complications, has prompted me, with Mr. Stoddard's authority, to withdraw the Stoddard-Dayton cars now tied with the two Pierce cars for the Hower trophy. Our confidence in the ability of our competitors to continue this thing under the existing circumstances for the major part of the summer, together with Mr. Moore's refusal to continue further with his entry, and Mr. Cox's determination to withdraw from the contest, prompts us to take this action. We wish to pay the highest tribute to all our competitors in this run-off, and sincerely trust that our action in this matter will be taken in the proper light.

"(Signed) HARRY B. TUTTLE."

Brockway in Overland Which Had Unfortunate Skid.

When R. M. Owen left this morning in his No. 4 perfect-score Reo, carrying Dai Lewis and the confetti, he said he could continue indefinitely on the job.

How They Reached Buffalo.

BUFFALO, July 25.—The five perfect score runabouts that left Saratoga on Friday morning on the run-off for the Hower trophy all reached here to-night with their scores in as good condition as when the run proper was completed.

The first day's run from Saratoga to Syracuse, a distance of 160 miles, the roads were fairly good.

In contrast to this was to-day's run from Syracuse to Buffalo, over a 180-mile course, 9-hour schedule, 50 miles of which were over slimy roads that had been soaked with a 12-hour rain and additionally moistened by a good downpour that lasted during the first two hours of the run.

The five contestants involved in the run-off are the following:

No.	Car	H.P.	Entrant	Driver
100	Pierce Arrow	40	R. D. Garden	J. S. Williams
103	Pierce Arrow	40	Chas. Clifton	E. A. Rattling
104	Premier	30	G. A. Weidley	G. A. Weidley
107	Stoddard-Dayton	45	G. P. Moore	G. P. Moore
112	Stoddard-Dayton	45	R. G. Cox	R. C. Shirk

Of these five machines the two Pierces are six-cylinders, of 43.8 horsepower; the other three, the Stoddard-Daytons and the Premier, are four-cylinder cars of much lower rating. The Premier is the only example of low-tension ignition, as well as the only one of the five having a multiple disc clutch. The two Stoddards and the Premier use selective gear-sets, where the Pierce cars use a three-speed progressive set, with the speed-change lever on the steering pillar immediately beneath the steering wheel. Magneto ignition is employed on all, and of special interest is the use of Goodrich tires on all five contestants.

The drivers are in every instance quiet, stand pat performers, not a single one of the grandstand variety. Ed. Rettling is a tester at the Pierce factory. He drove the Pierce pilot car in the New York-Pittsburg run in 1903, the car being a two-cylinder type. He drove from Boston to St. Louis in the St. Louis tour, obtaining a perfect score certificate. The present run is his third big performance. J. S. Williams is coupled with the New York Pierce Agency. He drove in the 1907 Glidden, carrying off a perfect score. George Weidley is factory superintendent and treasurer of the company, as well as being head of the Premier engineering department. He has never driven in a tour previous to the present one. Both of the Stoddard-Dayton drivers are novices at the touring game, but have already shown their knowledge of road driving.

Scores Were Unchanged at Cambridge Springs.

CAMBRIDGE SPRINGS, PA., July 27.—The five runabouts arrived here from Buffalo to-night without any change whatever in their perfect scores. The run was uneventful.

Third Day Brought the Changes.

PITTSBURGH, July 28.—To-day saw the commencement of the finish, with Weidley going out with a broken front axle, 48 miles out from Cambridge. The prime cause was a water crack, evidently due to the too sudden chilling of the forging. The immediate cause was due to coming over a sharp rise and then down a steep dip that at the bottom had a double washout. The place was just beyond Mercer, and on the regular route as laid out in the book, the detour made in the tour proper going through New Castle being avoided in the run off. Owing to heavy rains the better part of last week all through that section, and from the fact that the roads are of clay and with many sharp grades, there were many washouts covering 40 miles of the day's run.

Premier Runabout in the Maine Woods.

From this, it is the opinion of all in the present run that had the tour proper gone over this section there would have been less perfect scores, as it was a hard road to travel, irrespective of last week's weather conditions. Weidley was not the only one to come to grief, as Moore on No. 107, Stoddard-Dayton, broke his side frame, and, while finishing to-day with a perfect score, is hardly in position to continue for another day.

Another car not in the run was seen on this stretch out of commission with the down lever from the steering gear broken short off. The driver of this car had not ten minutes before offered sympathy and help to Weidley.

At the finish of to-day's run the cars had little, if any, time to spare, and are a unit in declaring the run the severest of them all. Weidley fixed up his axle and came in this evening.

THOMAS DUE TO-DAY IN PARIS ON LAST STRETCH

NEWS received late Wednesday afternoon to the effect that the Thomas car had crossed the French border and was rapidly approaching Paris, made it apparent that the American car would arrive at the French capital either that evening, or the next morning, thus making it the victor, by about 28 days, of the longest race that has ever been run, owing to the 30-day handicap of the Protos, due to the latter not having completed the crossing of the American continent under its own power by more than 1,000 miles. Dispatches received by the New York *Times*, from its staff correspondent on the American car, tell of the arrival at Berlin over one of the most magnificent stretches of highway that they had encountered in the whole of the 13,000-mile run. During the last stretch to the German capital, between Koenigsberg and Berlin, the Thomas was lost to sight, and, as no bulletins were sent ahead, the arrival of the American car in Berlin was entirely unannounced. It did not take long for the population to discover its presence, however, one of the first to greet Schuster being Colonel Koeppen, the white-haired father of the German lieutenant who successfully piloted the Protos into Paris Monday evening. The news of the Germans' successful arrival at the French capital did not disturb the American crew in the slightest, and but for the fact that botb Schuster and Miller are practically worn out with night and day driving, they would keep on at the same pace.

The silent and unannounced entry of the Thomas into Berlin brought forth profuse apologies and regrets from the German automobiling fraternity there, as had the car's coming been made known in advance, there would have been an escort to meet them some distance out of the city, and a formal reception. Count Sierstorpf, president of the Imperial Automobile Club, and Rudolf Ullstein, one of the four brothers who own the *Zeitung Am Mittag*, the German daily which backed the Protos car in the race, took Schuster and his fellow travelers in hand and tendered them a breakfast at the Fuerstenhof hotel, while the sight of the car over which the Stars and Stripes waved attracted a vast assemblage before the hotel.

In fact, from the moment the American car raced across the Russian frontier into Germany, there has been the most marked difference in the spirit of the greetings, a small group of peasants at Eydtkuhnen sending up the first real cheer that the Thomas crew had heard since leaving Japan. The sight of the American flag seemed to arouse the greatest enthusiasm, the pretty flaxen-haired peasant girls hurling bouquets and kisses at the travel-stained crew as if they were long-lost friends. All the way from St. Petersburg, the roads have been so fine that it was monotonous driving, after the constant struggle to make progress carried on ever since leaving Vladivostok.

Thomas Siberian Trip a Marvelous Feat.

When it is considered that on the run from Vladivostok the Protos has, through unfortunate accidents happening to the Thomas, been able to gain more than 10 days, the fact that the Americans will reach the end of their 20,000-mile journey but 48 hours behind is certainly a marvelous accomplishment. This will mean that they have won with a leeway of fully 28 days, as had they reached the French capital at any time within the 30-day allowance granted them against the Protos, due to the latter never having completed the American stage of the journey to San Francisco, as well as the fact that the Thomas crew wasted a fortnight in finding out that the Alaskan trails were impassable. The most wonderful feature of the run of the Thomas is to be found in its having covered every foot of the way under its own power, being the first to arrive at San Francisco of the numerous competitors then in the race, while the Protos never got beyond the Union Pacific Shops at Ogden, Utab, to which it had to return three times in succession for repairs of a serious nature. Had it complied with the rules as originally laid out, by completing the journey to San Francisco overland, thence to Vladivostok by steamer via Seattle, it is safe to say that the American car would have been half way across Siberia before the Germans arrived in the Czar's dominions.

But the Germans were game sportsmen for all that, as was evident from Lieutenant Koeppen's determination to keep on at all hazards, and by the manner in which he brought the Protos car through the numerous difficulties encountered in the Siberian wilds. Both the Americans and the Germans, as well as the Italian Zust team, started from Vladivostok together, the French De Dion team going as far as the Russian Pacific port, only to abandon the race there, Marquis De Dion giving as a reason, that having been through the Pekin-Paris of the year before, this would be only a repetition. The Thomas and its German rival kept together for the first few hundred miles, when Schuster found the Protos hopelessly mired. The German car was extracted from its mud bed with the aid of the Thomas' motor and the Germans stole a march on the Americans by abandoning the so-called road for the railroad right of way, which gave them a two-day lead before this was discovered. The Thomas crew also took to the railroad tracks, but in bumping its way over stretches of the unballasted ties, the car was damaged and five days were wasted in obtaining replacement parts, this being but the first of a long line of mishaps that befell the Americans from that time on.

From the very outset the crew of the Zust appears to have suffered the greatest misfortunes. It was at first reported that the Italian car would be withdrawn along with the Frencb De Dion from the Siberian leg of the race, but this later proved unfounded, and Scarfoglio started out of Vladivostok at the same time as his German and American competitors. His progress has been exceedingly slow, however, and althougb he would be entitled to second place by arriving in Paris at any time within 30 days after the Protos reached there, it does not seem likely that this will be the case, as according to last accounts he was still 5,000 miles away from the French capital when Lieutenant Koeppen officially registered there Monday evening.

Question of Awarding Thompson Prize.

It will be remembered that on the evening prior to the start of the race from New York, which took place February twelfth, Lincoln's birthday, a banquet was tendered to the drivers and crews at the A. C. A., during the course of which Jefferson De Mont Thompson, chairman of the racing board of the American Automobile Association, presented American flags to each one of the cars and offered a prize of $1,000 in gold to the crew which should be the first to deliver its flag in Paris. Actually, the Protos car has been the first to reach Paris, but under the rules, one of the most important of which had to be waived in order to allow it to continue as a competitor, it is not the winner of the race and it did not cover the entire distance under its own power, which would apparently seem to be a vital condition precedent to a claim on the Thompson prize.

The reception of the Protos at Paris was a most frigid affair compared to the great ebullition of joy which greeted the arrival of the German "victor" at Berlin, this being the manner in which the Protos was generally hailed there. In the French capital, two members of the committee of the A. C. F. bowed and shook hands with the Germans in front of the *Matin* office, and it was all over, indicating rather strongly that France's automobile pride is still writhing over the Grand Prix defeat, as well as its lack of representation in the present event, an impression that is further strengthened by the statement which appeared in *Le Matin* the next day, that the race had officially ended at Berlin for the German car, and accordingly there was no necessity for an official reception at Paris, though how this was figured out it is difficult to say.

OBSERVED IN THE BREAKING-IN OF A NEW HAND

By CHARLES B. HAYWARD.

"HANDSOMELY there, you lubber—steer small or we'll sink the next ashcart that crosses our course," yelled the driving instructor to the novice at the wheel beside him, and whom he had allowed to assume that post of importance in a burst of overconfidence in the learner's skill. A close escape from making a brougham minus one of its rear wheels, and the succeeding lunge to the opposite side of the more or less crowded street, that threatened bringing up against something undesirable, had considerably shaken this confidence and brought forth the above remark. In navy parlance, "handsomely" means a very little at a time, as in lowering something on the end of a tackle, while "steering small" is something that the aspirant for honors at any steering wheel has to acquire before he can become proficient in the art of guiding either a sea-going craft or an automobile.

Until he can learn to "steer small," the beginner is a memace to himself and everything else on the road; a ten-acre lot is the best place for him. That irresistible desire to yank the steering wheel half way round every time an obstruction looms up, is an extremely dangerous tendency that the average beginner finds himself possessed of the first time he takes his seat behind the steering wheel, and realizes what an *awful* speed the car is actually traveling at. Queer how 10 miles an hour seems five to the new man when he is sitting beside the driver, but when he is the driver himself and he finds it his duty to keep the machine on its course, and, worse than that, to avoid other users of the road, every one of whom appears to be heading straight for him, that otherwise most moderate speed seems little short of appalling. It looks as if nothing short of a half turn of the steering wheel would suffice to clear another onrushing car, or the exasperatingly dilatory wagons and pedestrians, who will persist in getting in the way.

Wide Streets Become Alleys to the Novice.

There is no street wide enough for the brand new hand at the steering wheel of an automobile to have plenty of seaway in. He finds the broadest of them all too narrow for him when he gets started on the see-sawing process that only the acquirement of the knowledge of "steering small" can cure. When it is borne in mind that it is seldom necessary to give the steering wheel a whole revolution to bring the front wheels to rigbt or left locking position, it will be apparent that the slightest movement of the wheel is greatly magnified in the effect it has on the angle of the front wheels, while the latter in their turn increase the effect they have on the direction of the vehicle according to the speed at which the latter is running. Hence, guiding an automobile, particularly through thick traffic, is an art that involves quite a few factors, the full value of each of which must be realized by the novice before he can attain to that eminencc of easy nonchalance with which the average driver tools his car along the city streets, apparently undisturbed by the maze that surrounds him on every hand.

It is only when he comes to appreciate the fact that the car responds instantly to the slightest movement of the steering wheel, for the automobile is the easiest vehicle to guide that has ever been invented, that the beginner really commences to learn how to take care of what is now justly considered the most elementary rudiment of the art of running an automobile. Over self-consciousness of the fact that he is sitting behind the steering wheel and that it is his duty to turn it, betray the tyro into most of his lapses from the straight path, and it was this same quality that made it difficult for many people to master the bicycle. They were under the impression that the handle bar had to be forcibly wrenched to one side or the other in order to obtain the desired result, whereas a little experience demonstrated that steering was practically an unconscious function, once the art was acquired. So it is with the driver of an automobile. It is nothing uncommon to see the driver of a racing automobile remove both hands from the whcel to adjust his goggles while going more than 30 or 40 miles an hour on the straightaway, and instances have been known where this apparently foolhardy performance has been indulged in at extremely high speeds.

Though such a practice is hardly to be recommended, the automobile can always be relied upon to guide itself to a certain extent when running straight ahead and at a moderate speed. If the forward wheels are parallel to the driving wheels, the car will continue to run straight ahead, with little or no deviation, so long as it does not run against an obstacle. Realization of this fact goes a long way toward firmly establishing the confidence of the beginner, for, as was the case with the new band on a bicycle, the would-be driver of a car hesitates to relinquish the wheel for an instant, lest the machine take a sudden freak into its head and turn a corner unaided.

There Are Other Equally Important Things.

This, together with the acquirement of sufficient ability in handling the wheel to know just how little or how much to move it to attain the desired end, is rcally all there is to the business of guiding the car. The rest is entirely a matter of experience—the gaining of that familiarity in handling the car which makes the driver a part of his machine. But it is only after he knows how to "steer small" that this begins to count, and the nautical term expresses a grcat deal in its brief two words, as most ambitious would-be drivers find out very quickly.

After all, steering a car is really the easiest thing to learn about its control, though gaining a knowledge of this rudiment is considerably complicated by the fact that there are other equally important operations that must be carried on simultaneously with the guidance of the vehicle. The average gasoline car presents an imposing array of pedals and levers to the inexperienced eye, and at first it becomes a difficult matter to remember just wbich ones require to be pushed and which have to be pulled to bring about certain results, and at the same time give that undivided attention to the essential of steering that seems to be so necessary in the early stages of the curriculum. It looks so ridiculously easy, the way the average driver starts and stops, takes his car in and out of the mazes of traffic, changes gear and performs the other operations incident to handling the car, that it does not seem possible that there are so many perplexing things to it as confront the beginner.

The new hand's first inclination is to jam on the emergency brake the moment that danger threatens, not realizing that the running brake under his foot is sufficient for all uses at ordinary speeds, and that reckless use of the more powerful brake is apt to mean a substantial increase in the tire bill, not to speak of the only too obvious indication of a lack of skill on the part of the driver that it implies. But next to steering, gcar-changing is the most difficult thing to master, and not alone the mere performance of this operation, but a realization of when it is necessary and when not. But the gasoline motor has a habit of stalling, when its speed and the gear on which it is running do not happen to agree, and when this happens in the middle of a busy street, it is more than sufficiently disconcerting to cause the novice to regard this peculiarity of the motive power of the car with due respect.

Beginners Invariably Leave Gears in Mesh.

Doubtless one of the hardest things to instill into the new hand is the danger of leaving the car with the motor running and the change-speed gears still in mesh, but it is a habit that is almost universal, as well as one that requires several lessons to overcome. Even then, there is as apt to be a relapse into forgetfulness of the importance of this essential, as there is to be due heed paid to the instructor's forceful reminders on this

point. An automobile has not ordinarily the inherent power of running away that is given as one of the most dangerous propensities of the standing horse, but when in this condition it can only be compared to the restive animal that will bolt on the slightest provocation. With the gears in and the motor running, only the interlocking device on the emergency brake that holds the clutch out prevents the car from starting of its own accord, and that it does not take a great deal to bring this about was made evident by a comparatively recent case in which a driver started the motor of his car with the gears in while on a ferry boat. The latter bumped the side of the slip in coming in and the shock was sufficient to release the emergency brake lever and allow the car to start. It all took place so quickly that the car went overboard, despite the folding gates, before the astonished driver could do anything.

Oiling is another item of considerable importance that the driver, in the process of having the rudiments thrust upon him, forgets to take due note of, so that frequently where the instructor purposely stops the flow of lubricant through the sight feeds to test the skill of his pupil in this regard, the latter goes ahead as if everything were in perfect working order. On many cars the oiling system has been reduced to such a high degree of self-contained simplicity that only periodical attention is required, but this is not the case on the old-timers that do duty as a medium for instructing those who aspire to the title that was imported along with the first French automobiles.

If the number of coachmen who have taken up the curriculum of the New York School of Automobile Engineers, at which the foregoing observations were made, were generally known, the weight of the phrase about the passing of the horse would be given a great deal more credence. Your typical Jehu is a born type and mechanical knowledge usually comes hard to him, but he makes an excellent driver at all times and particularly in the city. He is accustomed to paying due regard to the rights of other users of the road and he seldom has resort to speeds of much more than 12 miles an hour at any time. It is so much faster than he has ever been accustomed to traveling that he does not wish anything higher but is content to plod along at this conservative pace. He is methodical, too, and does not forget the necessity of oiling, filling water and gasoline tanks, and, above all, of keeping his machine scrupulously clean.

He forms quite a goodly portion of the number of men who seek automobile education as a means of bettering their positions in life, and while his mechanical skill upon graduation will not average quite up to that of the remainder of the student body, which is composed of young mechanics, electricians, garage attendants and the like, on the whole he makes a much more careful and conscientious driver than the latter class.

HOW ONE MAN BECAME AN AUTOMOBILIST

By A. H.

WHEN the auto fever first took hold of me, in the summer of 1906, my problem seemed insolvable. Even a runabout of standard make cost more than I felt justified in paying for a mere luxury, and yet such a vehicle would have been unsatisfactory, as it seats only two persons, and my family consists of three, none of whom would take much enjoyment in autoing if one had to be left behind every time the car was taken out. At last a friend, himself the owner of a fine gasoline touring car, advised me to investigate the merits of a certain steamer, which at this time, in spite of my careful study of the automobile question, I had never so much as heard of. I soon ascertained that second-hand cars of this make, in fair condition, could be bought for very little money, and in a short time I found what I wanted and made my purchase. My car cost me, delivered at my home, a little less than $375. This was just before cold weather set in, so that I did not attempt to get any use of it until the following spring.

On the opening of the season of 1907, as there was no one where I lived familiar with this particular make of car, I sent for an expert from a garage and repair shop in a neighboring city. He repacked a few valves, made some necessary adjustments, fired up, and gave me instructions in the management of the car. The following day I fired up and took the car out myself, unassisted, and ran it for several hours, both morning and afternoon. For a number of days all went well, and we were delighted with our acquisition.

But, after a time, a series of annoying mishaps occurred; none of them serious; many, in fact, mere trifles that I could now set right myself. They would not have been so perplexing if there had been any one in town acquainted with this make of car. As it was, I was obliged to depend on the foreman of the railroad repair shops, who is at liberty only after hours, and not always then. I got along, however, with some expense and much exasperation, almost on the verge of giving up autoing as too troublesome and costly an amusement for me, until the first week in July, when on the top of all my other troubles, the superheaters burned out.

Though disheartening enough at the time, this was really the best thing that could have happened, for it was the cause of my taking the car out of town to the repair shop above mentioned, where, with all necessary machine tools and spare parts at hand, a workman could do more in an hour than he could at my house in ten. My expert spent a few hours on the car, and did so thorough a job that from that day until the close of the season the car cost me less than one dollar for repairs and replacements. This does not include what I have paid for tires, which is another story. The tires were not new when the car came to me, and I have bought three new ones, at $22.22 apiece. I bought another before taking the car out this spring, so that I have four practically new tires, and two spares ones, good enough to carry for use in emergency. The car is in better condition now than when I bought it, and will undoubtedly cost far less to run this season than it did last.

During the summer, when I had ten weeks free, I ran the carriage nearly every pleasant day, at a cost of about $3 a week for gasoline. My entire outlay for the year, including original cost of car, three new tires, tools, and other equipment, gasoline, oil, barn rent, repairs, everything, amounted to a little less than $600. This is more than I intended it should be when I started out; but, considering all that we got for the money, it was probably money well spent.

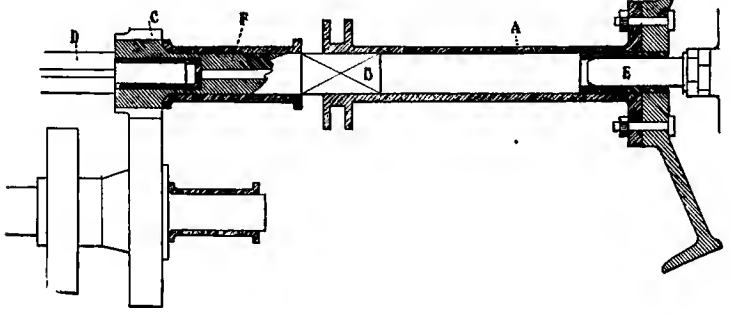
Being so much in the open air has benefited us all greatly. Autoing is better than medicine. Hitherto during the summer months books have been my chief occupation, and no open air amusement gave me much real pleasure. Last summer the automobile afforded a delightful form of recreation and a change of occupation so wholesome to both mind and body that I entered upon the work of the autumn and winter with a larger store of vigor than I had enjoyed for years.

Being unaccustomed to machinery and to the use of tools, I was surprised to find the automobile so simple and easy to manage and care for. My eleven-year-old boy can run it as well as I can: and I sometimes allow him to fire up, which he can do unaided, without one word of direction from me.

The little car is graceful in its lines and unpretentious in appearance. Indeed, it looks more like a buggy than an automobile, in spite of its low wheels, pneumatic tires and comparatively long wheelbase. It has ample power to carry four persons, is smooth-running and quiet, and easy to control even in the midst of a crowded street. Though it has its limitations and disadvantages, it has done all one could reasonably expect, and I am abundantly satisfied.

GOOD POINTERS FOR AMATEUR REPAIRMEN

OCCASIONALLY a car will be found in which unclutching fails to completely relieve the strain on the sliding gears, so that, although the clutch is disengaged, it is difficult to shift the gears. This is always due primarily to the forward journal of the squared shaft binding in the bushing in the first spur pinion which received the power from the clutch. The effect of this binding, however it happens, is to make the squared shaft tend to turn with the first spur pinion, and if any gear but the direct drive is in engagement there will be a drag imposed on the gears in mesh which will make them hard to shift. The cause of the binding between the square shaft and the pinion is another matter. If there is a flexible coupling between the clutch and the first spur pinion, the cause of trouble may be looked for in the gear box itself, in the shape of a sprung sliding gear shaft or badly aligned bearing carrying the first pinion shaft. Sometimes, however, there is no flexible coupling between the clutch and the gear box, and the clutch shaft A is internally squared to make a slip joint on a squared forward extension B of the first spur pinion shaft. See sketch. In this case there



How the Gearshaft May Become Sprung and Cause Binding.

is no more chance for disalignmcnt than is afforded by the side play in the square slip coupling just mentioned, and if, for any reason, that play is insufficient, the clutch shaft will forcibly slant the first pinion C out of line with the other shafts in the gear box, thereby cramping it on the shaft D carrying the sliding gears. Disalignment of this sort is usually due to sagging of the frame, and is to be corrected by suitably shimming the engine and the gear box, or the gear box alone, as circumstances require. If the engine rests on the side members of the frame by four narrow feet it may be difficult to hold shims in place under these feet. In this case both the front and rear ends of the gear box may be dropped to bring the gear box in line with the engine, and the rear end of the gear box may be dropped to bring the gear box in line with the engine, and the rear end of the gear box will have to be lowered more than the front end. If the gear box is boltcd to the under side of the cross members of the frame, shims are easily inserted, but if it rests on the latter it may be necessary to go to the trouble of soldering brass shims to the frame under the rear feet of the engine.

At Times Both Shafts Will Be Out.

In case it is found that the slide gearing and first spur pinion bind only in one position of the clutch, but are free when the clutch is turned 180 degrees, it follows that the clutch and pinion shafts are mutually out of line, probably owing to the internal squared portion of the clutch being out of line with the front bearing running on the engine shaft E, and the squared extension B of the pinion being out of line with the journal portion F. If these respective squared portions are separated and one is given a half turn it is likely that the errors will neutralize each other, making it very easy to correct the defect.

Some of the old forms of make-and-break igniters depend on mica washers for insulating the stationary electrode. These washers may be found at both the inner and outer ends, or at the inner end only. If they are at the inner end they are very easily rendered ineffective by deposits of carbon. It is of no particular avail to clean them with gasoline, if the oil soaks in between the mica leaves, since on subsequently burning out it leaves the carbon behind it, where, of course, it is perfectly inaccessible. For this reason the use of mica for internal insulation has been practically abandoned; but there are many cars still running which have igniters arranged in this way. Even when lava bushings are used, cleaning is occasionally necessary, although in this case it is much more effectual, and a little gasoline and sandpaper will keep a lava bushing in service for a long time. When the engine fails to ignite, particularly if all cylinders fail owing to a recent heavy dose of oil, and if the circumstances are otherwise such as to make it uncertain whether the igniters or carbureter is at fault, it may be desirable to test the insulation of the igniters without removing them. If the igniters have mica washers, an electrical test may be the only way to settle definitely whether or not the insulation is good. A very easy way to make this test is to use a battery of any convenient strength —a single cell will suffice—with a pocket voltmeter whose scale is proportioned to the battery used. All the electrodes are disconnected from the bus bar, and note is taken which, if any, of the igniters is making contact from the action of its cam. The others are then tested by putting the voltmeter in series with the battery, and connecting the free terminals of the voltmeter and the battery to the insulated electrode and the engine frame respectively. If the insulation is perfect the voltmeter will give zero reading. If the electrode is completely short-circuited, the voltmeter reading will be the voltage of the battery. If there is a partial short circuit due to carbon, the voltmeter reading will bear the same proportion to the full voltage of the battery that the resistance of the voltmeter coil bears to the resistance of the carbon short circuit, being low when the carbon resistance is high and increasing as the carbon affords a freer path for the leakage of current. If any of the igniters is making contact, the crank must be given a turn before testing it. If suspicion is directed to the magneto itself or the switch or wiring, one can tell whether or not a spark is produced at any igniter by touching the insulated electrode and the engine at the same time while the crank is turned. This test, however, will not betray carbon leakage.

A Simple Gasoline Separator.

An effective and very simple device for separating solid particles and water from the gasoline as it enters the carbureter is the tee connection shown in the sketches. The gasoline pipe is probably 1-8-inch pipe size and the union to the carbureter the same size. Both the pipe and the union can be threaded into the tee and a short 1-8-inch pipe 1 or 2 inches long is threaded into the bottom connection of the tee and is closed by a removable cap or petcock. The flow of gasoline through the tee will be slow enough to permit water and solid particles to setttle in the bottom pipe. Evidently the tee can be connected with ease, and without change in the length of the gasoline pipe, whether the carbureter connection is in the side or bottom. The threaded connections should be sweated together so vibration will not start leaks, this being a prolific source of trouble with poor joints.

ABOUT REPAIRING BROKEN CYLINDER CASTINGS

By M. E. WILSON.

WE recently had a couple of standard cylinder castings cracked as a result of the connecting rods breaking loose, and as we were too busy to await the arrival of new ones we set to work to repair them. No. 1 shows the first casting, which was cracked around the cylinder head just above the top of the piston stroke. Three one-inch holes ("*A*") were first drilled in the water jacket to examine the injury. Through these holes the crack was cleaned and "Smooth-On" put on; then a little solder was run into the crack on the inside of the cylinder. These holes were afterwards plugged with ordinary one-inch threaded plugs. Next, three 3-8-inch set-screws were run through the jacket and gradually set down against the cylinder head, offering little resistance to the flow of water and reinforcing the head immensely. This cylinder has been in use ever since—over four months—and we have discovered no signs of a leak nor any indications of weakness.

Another pair more seriously damaged is shown in No. 2 and No. 3. In this the crack was higher up, towards the center of the head. The crack was filled like that in the first casting and up seemed to be needed, however, and as the hand-hole plate on the top of the jacket was too light to hold screws, an iron strap was finally bound over the head and fastened with bolts ("*E*") through the lower part of the jacket, between the cylinders.

One end of the base plate of this casting was broken off, including the lugs for the bolts which hold the cylinder casting to the crankcase, and the repair made of this is also shown in No. 2 and No. 3. A dovetailed, overlapping brass corner was four set-screws ("*A*") put in to reinforce it. Some support higher moulded on and fastened by screws at "*C*," and the entire base was then reinforced by an iron band ("*D*") around it. As this was still not strong enough to take the strain of an explosion in the cylinder, a strap ("*B*") was put on, held to the side of the cylinder by the jacket hand-hole studs, with its lower end bent over and drilled to take the bolt through the crankcase. This cylinder, like the other, is still in commission and, considering its apparently hopeless condition when the job was undertaken, it runs surprisingly well. These two cases are striking illustrations of the fact that few repair jobs are absolutely hopeless.

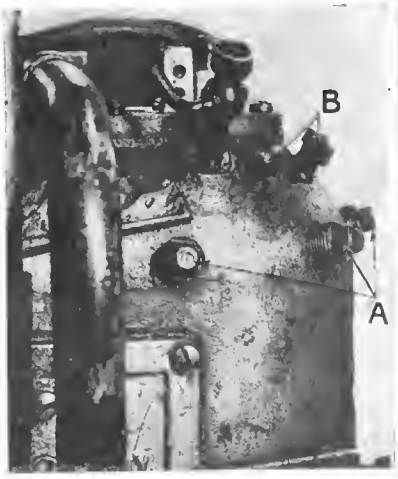


Fig. 1.

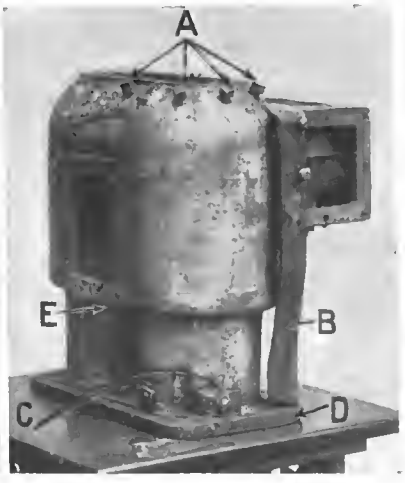


Fig. 2.

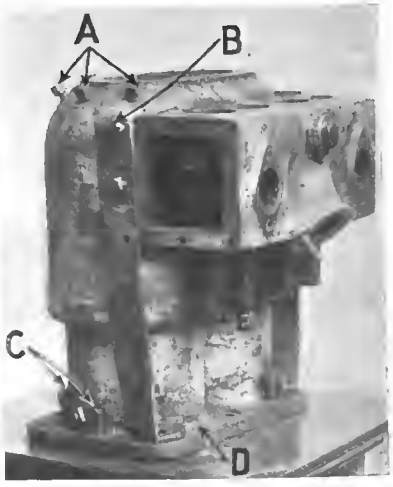


Fig. 3.

Reading from left to right, the illustrations show the manner in which two badly cracked cylinder castings were made sound. The first job is shown by the left-hand photo alone (Fig. 1), the letters A and B indicating the location of the holes made for examination, and the set screws. The other two pictures (Figs. 2 and 3) illustrate what was apparently a hopeless job, but which, with a little ingenuity, was remedied at practically a nominal outlay. The average repairman would have given up without attempting to fix it.

WHAT IT MEANS TO STOCK COMPLETE REPLACEMENTS

By JAMES E. COUZENS, Secy. and Treas. Ford Motor Company.

IT is as important to be able to fill a repair order as it is an order for a new car, and one of the principal troubles with so many automobile manufacturers is their inability to ship repair parts without keeping the purchaser waiting indefinitely.

Before the Ford Motor Company was organized I made up my mind that when I entered the manufacturing line I would make it impossible for a customer to fail to get any repair he might order, even if I had to dismantle a new machine to take care of the repair order. And when the Ford Motor Company was started that fact was kept in mind, and to-day a Ford owner anywhere in the world can order any part for a car, from a screw to a wheel, on any model, and have it shipped the day the order is received. We have to date made eight distinct models, but we carry a stock of repairs for each of them, and not only of each model, but for each little change made in each model, every one of which is carefully catalogued.

This is absolutely necessary and by putting yourself in the other man's place you will realize it. Suppose you are making a tour in the car you bought a couple of years ago, you have an accident and wire in for repairs. After waiting a day, suppose the house wires back "Account of machine being out of date cannot furnish repair parts ordered." How does that help you forty miles from nowhere? If we found that our parts department could not get the repair parts on the way in two hours, there would be another set of men for that department.

It costs money—lots of it—to maintain such a department. A quarter of a million dollars is easily invested in that way. Just the other day we issued a manufacturing order to make a one-hundred-thousand-dollar stock of parts for repair orders. But it's money well spent, for a satisfied customer means a recommendation of Ford cars to all his friends, and these personal recommendations are our biggest advertisements.

LETTERS INTERESTING AND INSTRUCTIVE

CORRECTING A WORN VALVE-SETTING.

Editor THE AUTOMOBILE:

[1,483.]—We hsve a Rambler two-cylinder car on which the factory setting of the valves is represented by the enclosed sketch. This is not ss we think it should be, and we would like to have your opinion as to the advisability of changing the original setting. We enclose a second diagram showing how we think the vslves should be set, but do not like to do this without first consulting you, and are accordingly taking the liberty of asking if you will help us out. EDWARD C. STILL.

Hamilton, N. Y.

If the car be an old one, the valve timing shown by your sketch illustrating the original setting of the valves, Fig. 1, would appear to be the result of wear, as this always tends to retard the valve operation. The intake appears to open quite late—almost 30 degrees on the circle of the flywheel, as shown by the sketch, whereas its opening should follow the closing of the exhaust valve as quickly as possible. The opening of the exhaust valve is also very much retarded, and, without knowing the circumstances, we should say that a motor with the valves set in this manner would be far from giving its rated output, and should think that it would tend to overheat considerably, particularly at high speeds, where it is desirable to give the exhaust valve quite a substantial lead. The closing of the intake valve appears to be the only part of the operation that is approximately correct, but this also seems to be retarded somewhat beyond what is consid-

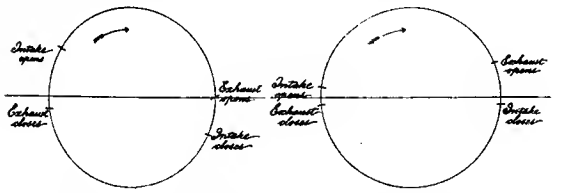


Diagram of Valve Action with Suggested Remedy.

ered as good practice by a great many designers, the majority holding it open not to exceed 15 to 20 degrees on the circle. We think it would also be advantageous to make the closing of the exhaust valve correspond more closely with the upper dead center.

Regarding your second diagram showing the valve-setting that you propose, Fig. 2, we should suggest making the closing of the exhaust and the opening of the intake closer together. The opening of the exhaust valve appears to be about right to get the best results, unless the motor is designed to produce its normal output at a rather low speed, say 800 r.p.m. or less, in which case the exhaust could be held closed for probably 10 degrees later. The intake valve is not held open long enough, according to this diagram, as suggested in our criticism of the original valve setting. Unless the car is an old one, in which case the trouble might be due either to worn contact faces, such as on the cam, tappet rod and the like, or to displacement of the cams on the camshaft, it may be that an error has been made in assembling, but in view of the numerous and painstaking tests through which the majority of manufacturers now put their motors this hardly seems probable. If the cams be integral with the shaft, it may be that the timing gears are improperly meshed, and upon comparing your two diagrams this seems to be likely in the case of the intake, as its lateness of opens corresponds with its delayed closing, but this does not hold good in the case of the exhaust, only the opening of which appears to be delayed. With the exception of the point of closing of the intake valve on your proposed diagram, the latter corresponds closely with present approved practice.

CARBURETERS USED IN THE GRAND PRIX.

Editor THE AUTOMOBILE:

[1,484.]—In your July 2 issue is a table of mechanical features of the Grand Prix racers and reference is made to carbureters, viz., perpendicular currents, parallel currents, converging currents, etc. I wish you would publish some information concerning these so that I could get some idea of what they refer to. I wish you would publish a description of the Mercedes engine that won the Grand Prix. AUTO ENGINE WORKS,

St. Paul, Minn. J. D. MOONEY, Pres.

The abbreviations you refer to are employed to indicate the manner in which the main air supply entered the carbureter and passed the gasoline nozzle. "Perpendicular currents," for instance, means that the air passed the gasoline nozzle perpendicularly; "parallel currents" indicates that two currents of air are led by the nozzle, while "converging currents" that two currents of air are brought together at the point of the nozzle. We must confess that we have never seen carburcters described in this fashion before, and on looking the matter up, find that our Paris representative has literally translated the French descriptions of the cars. Of course, these are perfectly legible to the Frenchman, but we do not wonder that you wished further light on the subject to make them intelligible. You will find a description of Lautenschlager's Mercedes, which also applies to the other cars of the same make, on page 137 of the July 23 issue of THE AUTOMOBILE. This is not as comprehensive as it might be, but the car is a specially designed racing machine and this represents the extent of our present knowledge.

QUERIES CONCERNING FUEL CONSUMPTION.

Editor THE AUTOMOBILE:

(1,485.]—Would be pleased to have you answer the following in "Letters Interesting and Instructive": Compared with similar cars in general, what can be regarded as a fairly economical consumption of gasoline per 100 miles for a 2,500-pound touring car with 6 by 7-inch opposed motor when carrying five passengers on average country roads?

With car and load identical in other respects, what per cent. more fuel (if any more) will be used by four-cylinder motor than two-cylinder opposed of same rating, traveling same road? Compared with 6-inch by 4-inch opposed motor, about how much more fuel will be required by good 4 1-2 by 4 1-2 cylinder vertical two-cycle motor, other conditions being the same?

Is there any preparation to be had which will prevent or lessen the accumulation of rust in cooling water in an automobile?

Pleasant Lake, Ind. C. A.

Five to six gallons would be an economical showing for this distance, but the consumption would naturally vary according to the amount of low-gear work that was necessary, as well as with the character of the road surface. On a good road, such a car as you mention ought to be capable of covering 17 or 18 miles to the gallon. The difference between this and the consumption of a four-cylinder motor of equivalent power in the same car would not be very great, though readily perceptible. Doubtless such a car would average 15 to 16 miles to the gallon under similar circumstances. As compared with the two-cylinder opposed horizontal motor of the four-cycle type, the four-cylinder, two-cycle motor might use anywhere from 10 to 50 per cent. more fuel, according to the efficiency of its design. Unfortunately, the two-cycle motor has not been brought to the same degree of standardization that characterizes the four-cycle, so that it is naturally difficult to make comparisons of this kind that will hold good generally. It is safe to say that the two-cycle, four-cylinder motor will require considerable more fuel than the two-cylinder, four-cycle, as the two-cycle is not as economical as the four, and adding to the number of cylinders always tends to increase the consumption, but just what this excess would be cannot

be stated definitely, as two-cycle motors of some makes are known to operate very much more economically than others.

There are numerous boiler compounds on the market that are intended to prevent scale and rust on the interior of a boiler and we have no doubt they would be found equally effective in the case of an automobile radiator. Probably more so, as the conditions in the latter are not so bad, in that the water seldom actually boils away to any great extent, so that scale-forming conditions are not present.

AN IDEAL THAT IS ALREADY "ON WHEELS."

Editor THE AUTOMOBILE:

[1,486.]—I have read so much this year about the "ideal car" that I, an old subscriber to "The Automobile," would like to have my say. My "ideal" is not a "dream on paper," but a "dream on wheels," the 1908 Model M Pope-Hartford. Now, I haven't come to this decision from merely looking at the specifications of the 1908 Pope-Hartford, although this alone is quite convincing. But when you consider that my 1907 Pope-Hartford was driven 10,000 miles through four States over variable roads and at a good speed, as I like to go fast, and never failed to take the opportunity to let her out, all of this strain without one repair of any kind whatsoever and with but a 25-cent replacement (a part of the magneto), you can see that my decision is based upon sound facts brought to light by experience.

The 1908 Model M Pope-Hartford "30" touring car has all of the standing up qualities of the 1906 Model F and the 1907 Model L, and the wonderful hill climbing ability also, but with the luxury of any $5,000 car built and the style and general appearance of the most costly foreign or American cars. But just think of the comparatively low first cost and the very low upkeep. What more ideal car would the idealist want?

I am in no way connected with the trade, but just one of many enthusiastic Pope-Hartford owners.

E. D. R.

Spring Lake, N. J.

Your ideal is the first tangible one to come to light, and those who are indulging in "dreams on paper" for future investment might well follow your example and indulge in a "dream on wheels," as some of the proposed ideals will take a long time to materialize and undoubtedly many of them will never reach that state.

(The writer of the foregoing letter has requested us to give his name and address to any inquirers, but did not care to have it published in this connection.—ED.)

ANOTHER IDEALIST IS HEARD FROM.

Editor THE AUTOMOBILE:

[1,487.]—Every little while someone writes about his ideal car, so I think I will add mine to the collection. Engine, three-cylinder, two-cycle, 30-horsepower, thermo-syphon circulation, three-point suspension, internal expanding clutch, three speed and reverse selective type of change-speed gear-set, and a unit power plant. Atwater-Kent spark generator. Wheelbase 105 inches, 36 by 4-inch tires on Fisk detachable rims, full elliptic springs with Hartford-Truffault shock absorbers. Pressed steel body with detachable tonneau. All trimmings that are usually brass, such as levers, etc., to be gunmetal or copper oxidized finish; also lamps, speedometer, windshield trimmings and the like.

I believe that if half the time that is spent in polishing brass were used to keep the engine and transmission clean and in proper shape, owners would get better service out of their cars.

Paterson, N. J.

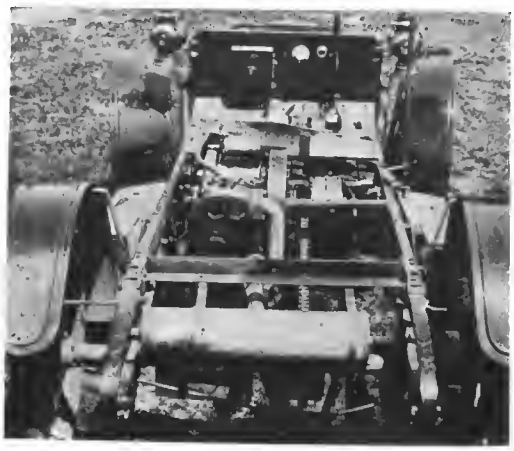
ANTI-BRASS.

As is the case with another contributor to the list of ideals, yours seems to be one that is already on wheels and not merely in the paper stage, as the specifications you quote sound strangely familiar and read something like a catalogue. In other words, it strikes us as if you were describing the Elmore three-cylinder two-cycle car. We quite agree with you on the subject of brass polishing and it is noticeable that the tendency in this direction is quite general. A plethora of fine brass work to polish is certainly out of place on the car when its owner is also its driver and caretaker. There is nothing quite so ornamental as brass trim when it is kept in proper shape, and likewise there is nothing that looks quite so disreputable when it is neglected as that same brass work. For the autoist who employs a man to do nothing but drive and look after his car continually, this does not involve any hardship, as a good car does not require a competent man's entire time to keep it in shape, no matter how much it is run. But where the owner is his own chauffeur it is quite another story. Polishing brass is rather a lazy man's job and takes considerable time, which, as you say, might much better be applied to keeping the mechanical details of the car in shape.

INCREASING HORSEPOWER OF AN OLD CAR.

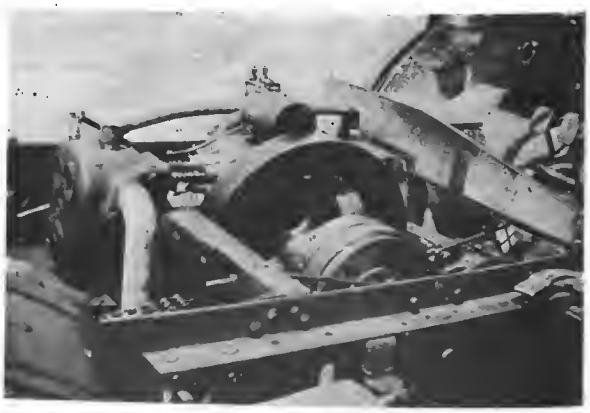
Editor THE AUTOMOBILE:

[1,488.]—In your issue of "The Automobile" of June 25 you published a letter from Joseph Sylvester, of Jamaica, N. Y., in which he made an inquiry as to whether he could install a two-cylinder 10-horsepower motor on a 6-horsepower chassis. You advised him not to try it, and as he does not state the make of car it would be impossible to say whether it would be of advantage in his case or not. Enclosed please find two photos of a remodeled one-cylinder Pope-Hartford. The motor is a Bellfus two-cylinder, 18-20-horsepower. As it is the same make as he inquired about and which you expressed ignorance of, I will say that it is all to the good.



Rear View of the Remodeled Chassis.

Fig. 1 shows chassis view. At the rear can be seen the muffler; and this also shows how wheelbase was lengthened six inches by use of three-quarter springs. Fig. 2 shows the power plant. The forward cylinder is just under the footboards. The car was also changed from a rear entrance to side entrance, this being made possible by the lengthened wheelbase. The car now carries five people comfortably and has a maximum speed of 47 miles per hour. New parts required were as follows: Engine and timer, oiler, three-quarter springs, one foot of chain, two dash coils, new mudguards, copper gasoline pipe, gas tank being moved forward under the bonnet. The old one-cylinder engine is sawing wood.



How the New Power-plant Was Installed.

DOUGLAS ADAMS.

Keene Valley, N. Y.

The job of installing a larger power plant on an old car such as you refer to, and that afforded by the problem submitted to us by the inquirer in question, are two very different things, as you will see by again referring to the specifications he gives in his letter. The substance of his

inquiry was whether it would be advisable to install a twin-cylinder horizontal engine of the same power as the vertical engine originally placed on the chassis, i.e., 6 horsepower, in order to overcome the excessive vibration, or whether it would be better to employ a 10-horsepower engine of the twin-cylinder opposed type. We are of the opinion that it would not pay the inquirer to do either with nothing better than the chassis he described to build on, and because you have succeeded in installing an 18-horsepower motor on a chassis well adapted to carry it does not suffice to alter his opinion. You have evidently made a very good job of rebuilding your car, to judge from the photographs submitted and published herewith, and there are doubtless many old-time cars that could be similarly improved.

PLACING A NEW CAR ON THE MARKET.

Editor THE AUTOMOBILE:

[1,489.]—I am a member of a company which has developed a gas engine especially desirable for auto vehicle work of all kinds, and as we are not fully convinced in regard to the style of vehicle with which to introduce our engine, I am taking the liberty of addressing you on this subject. Your intimate knowledge of the field and its wants will enable you to give me some helpful suggestions. If you will kindly answer the enclosed list of questions I will greatly appreciate it:

(1) What in your judgment would be the best vehicle for us to make first—Runabout, touring car, roadster, freight truck, or light delivery wagon? If roadster, what horsepower?

(2) If runabout, what horsepower and price? Same with regard to touring car, truck and delivery wagon, this constituting questions 3, 4 and 5.

(6) Which of the above could be most readily sold and which would be the most profitable?

(7) Which class of vehicle will be in the greatest demand in the future? A. C. H.

Los Angeles, Cal.

(1) Considering all the circumstances, we should think the building of a standard chassis upon which could be fitted a runabout, touring, roadster or light delivery wagon body would be the most advisable manner of starting. Twenty horsepower would be ample for a light car, and to keep it within the bounds of general demand in the various rôles it has to assume it should not exceed 25-30 horsepower. This also serves to answer your questions 3 to 5 inclusive. No. 6 is rather more difficult. At the present time the pleasure vehicle is easier to sell and may, in consequence, be put down as more profitable in a new enterprise.

(7) There is no doubt that the commercial vehicle will be in great demand as progress and education in its use develop, but it is likewise quite apparent that the demand for the pleasure vehicle must be equally great, as it is constantly being brought within the reach of an increasingly greater proportion of the population.

ABOUT THE BEST ROUTE TO SARATOGA.

Editor THE AUTOMOBILE:

[1,490.]—I should be much obliged if you would kindly inform me in your columns of "Letters Interesting and Instructive" what is the best road to take to go to Saratoga, good roads being desired. Also, what is the best road at this particular time for going from Albany to the Berkshires? I have heard that the road usually given in the road book is now being repaired, and is, therefore, in very bad shape for a good part of the way. J. R. PETERS.

South Orange, N. J.

The best way from South Orange to Saratoga is via Newark, Newburgh, Poughkeepsie and Albany, which is covered entire by the following references to the 1908 Blue Books: Newark to Passaic, Ridgewood and Hohokus, N. J., pages 101-103 of Vol. 3, connecting at Hohokus with the New York-Tuxedo-Newburgh route, pages 99-100 of the same volume, giving the exact mileages, with full running directions to Newburgh. Descending to the ferry and taking same to Fishkill Landing village (not Fishkill village proper, which is four miles farther inland), immediate connection is had with the New York-Poughkeepsie route in Vol. 1 (last part, pages 79-80), which will carry to Poughkeepsie. See (particularly) in this connection the Fishkill Landing diagram, page 73, which will make this part of the route clear.

Poughkeepsie Section Route No. 2 (pages 276-281 of the New York book, Vol. 1) will extend the run to Albany by exact mileages and reliable information throughout. Albany Section, Route No. 8 (pages 328-329 of the New York volume, No. 1) will carry you through to Saratoga by what is generally considered the best of the several available routes, though this line was not revised new for 1908. Your information as to the repairs being made to the Albany-Pittsfield usual routes this year is correct, an emergency which is covered by a special route via the Post Road, Valatie, Chatham, Stockbridge and Lenox (pages 305-307 of Vol. 1, New York State volume). Except for the unusual conditions between Albany and Pittsfield, the roads mentioned are good practically throughout.

INCREASED MILEAGE WITH LESS PRESSURE.

Editor THE AUTOMOBILE:

[1,491.]—As you are probably aware, I have made very considerable experiments to find out, firstly, whether reduced pressure decreases the speed of the vehicle fitted with pneumatic tires or not: secondly, whether decreased pressure decreases or increases the life of the tire. The first series of tests prove that reduction of pressure in the tires makes practically no difference in speed.

The second series of tests prove that you can use your tires with less preseure than was commonly thought, and, therefore, the whole car rides more easily and smoothly, and at the same time the tires actually last longer. The tests have all been carried out on the road on my own six-cylinder Napier.

The weight of the car complete, as I generally drive it, was a shade under 35 hundredweight. The result was that with 60 pounds pressure in the front tires, 880 by 120 mm., they ran 88 per cent. further than when the pressure was kept at 70 pounds to the square inch, and when the preseure of the back tires (895 by 135) was reduced from 85 pounds to 70 pounds, I got an increased mileage of 49.9 per cent. It is, therefore, clearly proved, that reduced pressure means greater comfort on a motor car and less expense in tire bills.

I am now carrying out experiments with still lower pressures, but owing to the distance one has to run, it takes a considerable time to obtain results. S. F. EDGE.

London, Eng.

This is an extremely interesting line of experiment and one that is of vital importance to automobilists at large, particularly as the results shown run directly counter to the prevailing impressions on the subject, tire manufacturers without exception cautioning users at all times to maintain their tires well inflated. They also go counter to the reasons that tire makers and tire experts have advanced for keeping pneumatics well inflated, in that a good pressure prevents the side walls of the tire from bending so much, which is given as the chief cause of rapid wear, and especially of that bugaboo of the autoist, blowouts. Further data as the result of carefully carried out investigations will not only be of great interest but should prove valuable.

AN UPHOLDER OF THE FRICTION-DRIVEN CAR.

Editor THE AUTOMOBILE:

[1,492.]—Referring to your letter No. 1,452, I would like to say that I think if Mr. Meiser will get the right kind of a friction drive car, it will prove very satisfactory. There are a great many hills in Southern California, having driven an Earl roadster all over the hills around here.

Was there ever an eight-cylinder Darracq in a Vanderbilt Cup race? WALDO D. WATERMAN.

San Diego, Cal.

We have no doubt that friction-driven cars are making a success in practically every part of the country, or it would not be so easy to introduce them. But only the man who owns and drives such a car knows what it can do.

There was never an eight-cylinder Darracq used in a Vanderbilt cup race. The car you evidently have in mind was the Darracq, driven by Demogeot in the straightaway speed trials at the Ormond-Daytona meet, January 29, 1906, and in which he made the record of :58 2-5, in the two-mile-a-minute race.

COMMERCIAL MOTOR VEHICLES NUMEROUS IN INDIANAPOLIS

INDIANAPOLIS, IND., July 27.—There are few lines of business in this city that do not use, in some form or other, an automobile runabout, delivery wagon or truck. It is only within the last two years, however, that the delivery wagons and trucks have attained anything at all like popularity.

In the first place, the city is well adapted to the use of motor commercial vehicles. Streets are well paved and well kept; there are no hills and the expense of up-keep is materially lessened by the maintenance contract that has become quite popular within the last eighteen months.

The maintenance contract, in fact, has doubled the use of the automobile for commercial purposes in little more than a year. Under it the selling agent agrees to keep the vehicle in service every day in the year for a specific amount each month. The truck or delivery wagon is to be left at the agent's garage over night, when it is thoroughly overbauled and cleaned. If it breaks down in service an emergency car is sent to take its load and finish its work for the day.

There is only one instance recorded in Indianapolis where a business concern has discontinued the use of automobiles. An investigation revealed that this was a firm of undertakers that used an electric runabout night and day for five years, then discarded it for the very good reason that it was badly worn out.

With one exception, all local department stores are using commercial vehicles; a firm of plumbers have had built a very successful delivery wagon with a Marmon chassis as a basis; wholesale and retail cigar dealers, manufacturers of food products, wholesale and retail grocers, furniture dealers, brewers, piano dealers, express companies, parcel delivery companies, hardware merchants, manufacturers and many others are successfully using delivery wagons and trucks.

The latest acquisition is an immense gasoline van just placed in service by a firm of household goods movers. The company also sells second-hand furniture, so that the big van is used both for delivering furniture and moving household goods. This is the first company of its kind to use a motor vehicle.

There are about 250 runabouts and touring cars in the city used for business purposes, many of which are used by city and traveling salesmen. During the last year half a dozen implement and farm machinery companies have equipped their salesmen with runabouts. The public utility corporations and the various municipal departments have automobiles in service.

Both those who sell and use automobiles for commercial purposes say that the motor wagon and truck has come to stay.

AUTOMOBILES NEEDED IN CEYLON.

In a report from Colombo, Consul E. A. Creevy states that there is a considerable market for automobiles in Ceylon, which needs only proper development. Some 1,200 tea and rubber estates are situated on the island, and as railroads are still very few practically every one of these could make good use of an automobile. The question is whether the need would be recognized by the expected purchasers. At present there are only about 200 cars in use, and only one of them of American make.

The conditions demand a machine which is a good hill-climber, reasonable in cost, and economical in operation. The importance of the last requirement may be seen from the fact that the Colombo price of gasoline is 50 cents a gallon. The island is very mountainous, and most of the plantations are reached only by narrow roads with heavy grades and sharp turns, where the driver is liable to find himself confronted at any moment by a bullock cart taking up the whole width of the roadway, with a rocky wall on one side and a precipice on the other.

No business can be done by means of catalogues only. The manufacturer who wishes a share of the Ceylon market should begin by sending out a representative with a sample of his machine, with the assurance that a supply of parts would be kept at Colombo. This last condition is essential, as it is useless to expect a purchaser to place himself in the position of having to wait, in case of accident, three months for a part to be shipped from the United States. The three companies at present handling autos in Ceylon are listed at the Bureau of Manufactures.

USES A HORSE IN HIS GARAGE.

A horse in a garage certainly seems out of place, but that is what the curious may see any day in Asbury Park, N. J. The idea originated with William Powell, night foreman of the Zacharias garage. He uses the animal to haul the cars to and from the washing stand, instead of having them pushed by manpower, and says he gets the moving done in one-third the time. There is also a considerable saving in wages, as some five or six men are dispensed with by the new arrangement. The plan is very simple. The horse is direct-connected to the front of the car, transmitting his power to the rear hoofs without the use of a clutch; a chauffeur specially trained in the language of "gee" and "haw" takes the wheel, and away they go. The present record to and from the stand is between 40 and 50 seconds.

WASHINGTON'S AUTO MAIL COLLECTING.

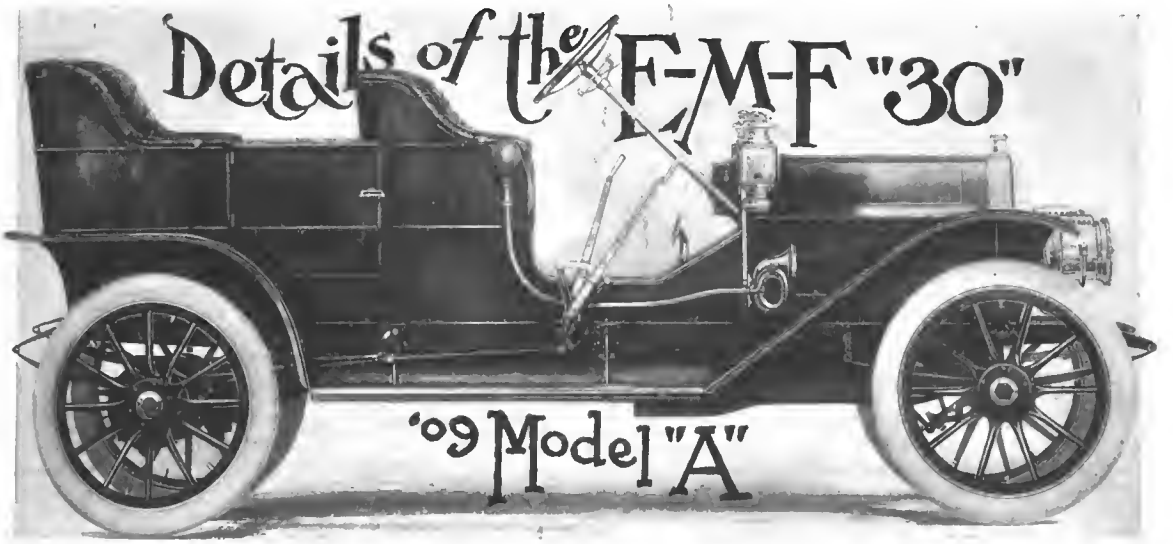
WASHINGTON, D. C., July 20.—Two single-cylinder Cadillacs have been purchased by the postal authorities of this city for the purpose of determining the advisability of substituting automobiles for the present horse and wagon system of collecting mail. A special appropriation of $1,440 was secured for this purpose and out of this sum the cars must be maintained for a certain period. The routes selected for the two automobiles, which will be put into service on August 1, are located in the upper and lower parts of the city. While the cost and maintenance of the two automobiles is $60 more than that now allowed for the horses and wagons, the use of the automobiles will result in the saving of two letter carriers, who are to be assigned to the delivery service. If the results achieved with the automobiles prove satisfactory it is likely automobiles will be substituted entirely for the horse and wagon collection service throughout the District of Columbia.

AUTO TRADE DIRECTORY FOR JULY, 1908.

The *Automobile Trade Directory*, which is issued quarterly by the Class Journal Publishing Company, 231-241 West 39th street, New York, has just made its appearance for July, 1908. It is now a volume of 384 pages, thus exceeding in size any of its previous issues, and it is correspondingly more replete with information of a nature that every designer, purchasing agent, garageman, or, in fact, anyone who has to do with the automobile industry, has pressing need for at one time or another. It is the aim of the publishers to make it a most complete compendium of the American automobile industry, and a review of its pages leaves no doubt as to the manner in which they have succeeded in carrying out this work. Every manufacturer of anything pertaining to the automobile, whether directly or indirectly, is listed in a manner that makes reference easy and saves much useless searching, while there is also a great deal of information in the shape of data that is of considerable value.

The tax imposed upon foreign automobiles entering Germany has yielded only 1,618,834 marks instead of the 3,500,000 marks expected. In addition it has deprived the country of other and more important revenues, and altogether has proven itself to be the unsatisfactory legislation that its opponents predicted.

Details of the E-M-F "30"



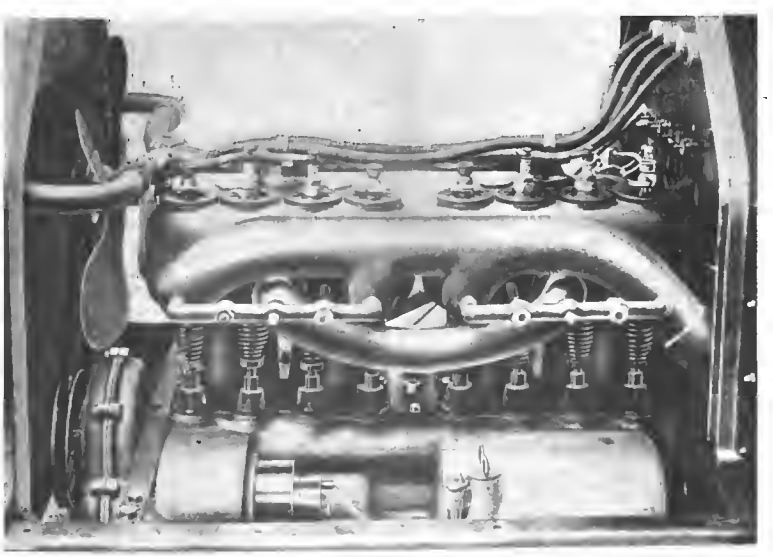
WITHIN the last few months a new descriptive term has come into vogue in automobiling. It is the word "classy," and, in a few letters, it conveys more about the appearance of some of the new medium-priced cars that have been responsible for its creation than a ream of description. Hence, the publicity statement that the new Everitt-Metzger-Flanders production is the "classiest thing on wheels at its price." That there is ample justification for this will be evident when the foregoing illustration of the new E-M-F "30," which is its official title, is viewed with the knowledge that here is a modern four-cylinder machine, of the most approved design and construction, to sell complete for $1,200.

But it is not all appearance by any means. The official announcement of the consolidation of the Northern Motor Car Company and the Wayne Automobile Company, both of Detroit, and the experience and standing of such men as Messrs. Everitt, Metzger and Flanders in the automobile industry is a guarantee that the car will be all that is claimed for it, while the backing of men like William T. Barbour, J. B. Gunderson, Charles L. Palms and J. B. Book goes to show that the new company will have almost unlimited resources and intends to do things on a scale that makes the building of a modern four-cylinder car at this price a possibility.

However, the car really speaks for itself, as the following specifications go to show. A perusal of these makes it plain that the machine is what has generally come to be accepted as standard construction. There are no freak innovations or radical departures of any nature. The 30-horsepower motor has its cylinders cast in pairs with the water jackets integral and valves all on one side. The latter are interchangeable, and are mechanically operated. The cylinder dimensions are 4-inch bore and 4 1-2-inch stroke, the motor being designed to produce its rated power at a moderate compression and speed, factors which make for durability. A feature that will be generally commended by both designers and users alike is the elimination of the aluminum alloy supporting arms of the motor. This material is employed for the crankcase proper, but the weight of the motor is carried on pressed steel arms of "U" section, which do not weigh any more than the usual aluminum supports, but which are far stronger and much more flexible, thus insuring greater safety at this vital point.

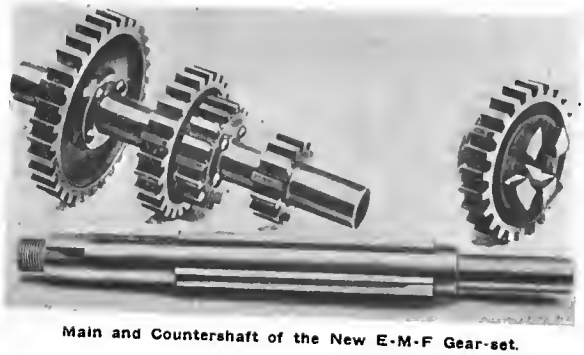
Details Have Come in for Painstaking Attention.

In going through the specifications it will be evident that while standard practice has been closely followed, it has not been slavishly adhered to, detailed refinement and improvement having been made wherever the designers thought it necessary. For instance, the valve guides are machined and pressed into place on the cylinders, instead of being cast integral with the latter, thus making it easy to replace them when worn. The valves themselves are very large, measuring 2 1-8 inches in diameter, and are drop-forged from special steel, both the stems and seats being accurately ground. In addition to providing ample sized valves, the inlet and exhaust passages have been made very large and unobstructed.

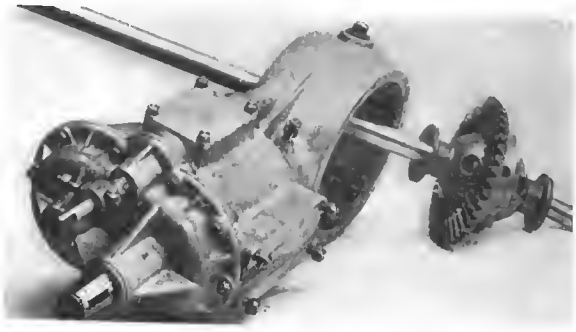


Working Side of Motor Showing Magneto and Lubricating Oil Reservoir.

The single camshaft of the new E-M-F "30" is made in one piece, with



Main and Countershaft of the New E-M-F Gear-set.



Aluminum Housing for Gear-set and Differential.

the cams integral, the piece being case-hardened after milling out the cam contours to machine finish, and the latter are then ground and "miked." That is, tested with a micrometer gauge reading to thousands of an inch, and it is by such painstaking care in the manufacture of the parts of a car that silent and efficient running is insured. The crankshaft is drop-forged from special steel, and is supported on three main bearings of babbitt, offset 3-4 inch from the center line of the cylinder, thus relieving the walls of the latter from excessive side strains. A flange, forged integral with the shaft, carries the flywheel. Connecting rods are steel drop-forgings of I-beam section, big ends being of the marine type, while phosphor bronze bearings are provided at the piston-pin end. Shims are provided for the adjustment of the die-cast babbitt crankpin bearings, and this may easily be effected through the large hand holes in the bottom of the crankcase. The latter are closed with sheet steel covers, in place of aluminum, as is usually the case. Five-inch pistons are used, fitted with four compression rings, both the piston and its rings being accurately ground to size. The hollow piston pin is a piece of case-hardened steel, and is also ground. All the moving parts of the motor are carefully balanced mechanically to reduce vibration to the lowest possible point.

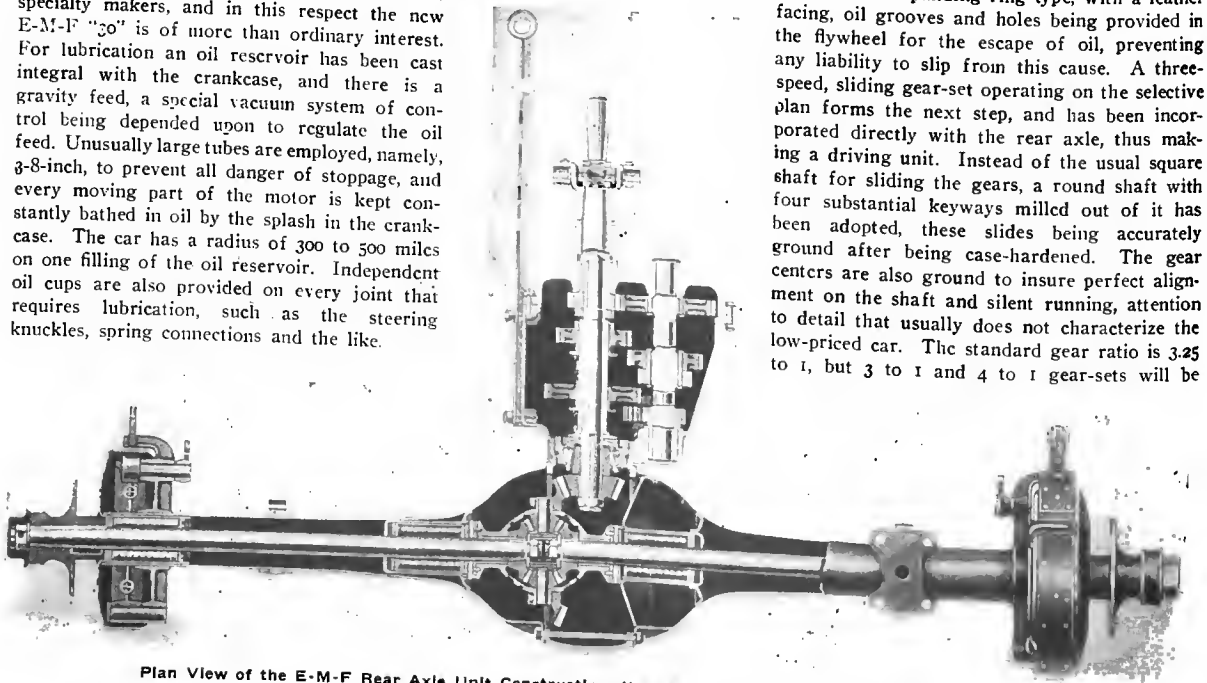
Motor Accessories Are of Interest.

It has been usual hitherto in placing a low-priced car on the market to purchase its accessories from the specialty makers, and in this respect the new E-M-F "30" is of more than ordinary interest. For lubrication an oil reservoir has been cast integral with the crankcase, and there is a gravity feed, a special vacuum system of control being depended upon to regulate the oil feed. Unusually large tubes are employed, namely, 3-8-inch, to prevent all danger of stoppage, and every moving part of the motor is kept constantly bathed in oil by the splash in the crankcase. The car has a radius of 300 to 500 miles on one filling of the oil reservoir. Independent oil cups are also provided on every joint that requires lubrication, such as the steering knuckles, spring connections and the like.

Doubtless the most unusual feature of a car to sell at such a low price is the fitting of a magneto as a part of the regular equipment, the makers stating that "it is as much a part of the E-M-F motor as are the valves." The magneto is a part of the design, and is permanently attached, the gears and all moving parts being enclosed in an oil-tight and dust-proof case. It is fitted so as to be readily removable for inspection. In addition to the magneto there is an emergency system of ignition, consisting of a quadruple unit dash coil, in the high-tension side of which an innovation has been made by connecting the leads through the back of the mahogany case and the dash directly to the plugs. The timer is an improved Lacoste type, mounted on a vertical shaft, and driven by bevel gears from the camshaft. Another feature of the motor to be commended is the separate housing of camshaft and magneto gears, lubrication being by non-fluid oil. Cooling is on the thermo-syphon principle, supplemented by a belt-driven fan consisting of a steel stamping, mounted directly on the motor, instead of being attached to the radiator; an eccentric belt adjustment is provided. The carbureter is a simple, single-jet design of the float-feed type, located in an accessible position on the off side of the motor and is an exclusive design that is turned out complete in the E-M-F plant.

Features of the Transmission System.

The clutch is an improved expanding ring type, with a leather facing, oil grooves and holes being provided in the flywheel for the escape of oil, preventing any liability to slip from this cause. A three-speed, sliding gear-set operating on the selective plan forms the next step, and has been incorporated directly with the rear axle, thus making a driving unit. Instead of the usual square shaft for sliding the gears, a round shaft with four substantial keyways milled out of it has been adopted, these slides being accurately ground after being case-hardened. The gear centers are also ground to insure perfect alignment on the shaft and silent running, attention to detail that usually does not characterize the low-priced car. The standard gear ratio is 3.25 to 1, but 3 to 1 and 4 to 1 gear-sets will be



Plan View of the E-M-F Rear Axle Unit Construction, the Main Housing Sections Being of Sheet Steel.

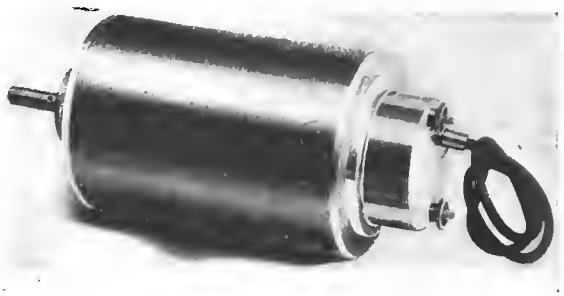
optional with the purchaser. The bevel driving gears have been made unusually large, both these and the sliding gears being turned out of a special alloy steel and accurately cut. Two universals are fitted on the propeller shaft. The differential is of the bevel gear type, something that has hitherto appeared only on the higher-priced cars, with but few exceptions. With the high gear ratio mentioned, the E-M-F is said to be capable of 50 miles an hour, or a range of from 4 to 50 miles on the high gear.

Details of the Chassis and Running Gear.

The rear axle is of the semi-floating type, and its design and construction form a chapter in themselves. Due to the use of drawn steel as the material and autogenous welding for putting the parts together, coupled with its design, this axle is said to weigh less than any other of its type on cars of similar weight and power, notwithstanding that the gear set is incorporated with it. The right and left sections of the housing are drawn from sheet steel and welded by the new process, Hyatt roller bearings in hardened and ground removable sleeves carrying the load. The thrust of the driving pinion is taken on a Timken roller bearing, while the differential thrust bearing is of babbitt between ground steel washers. All gears are in an oil bath, provision having been made to keep the housings oil-tight, and also to prevent oil running out of the axle ends when on an incline, so that the car should be free from dripping oil.

The forward axle is a one-piece drop forging of heat-treated steel, with the spring seats forged integral, the steering knuckles and connections also being drop forgings of steel. The steering gear is of the worm and sector type, these parts being made from specially hardened steel, while all surfaces are ground. The gear-shifting levers have been placed on the driver's right hand, as usual, but the control levers are on the steering pillar at the left and below the wheel, instead of on top, it being easy to operate them with the left hand, without releasing the wheel. An accelerator pedal is also provided. The left pedal operates the clutch and the right the service brake, the usual hand lever, with ratchet lock, being provided for the emergency. The brakes are centered on special drums on the driving wheels, the service brake consisting of camels-hair-lined steel bands, acting on the pressed steel drums, while tbe emergency brakes expand against the inner face of the same drums, and are of the metal-to-metal type, both sets being double-acting. Pressed steel discs enclose the drums, making them dust-proof.

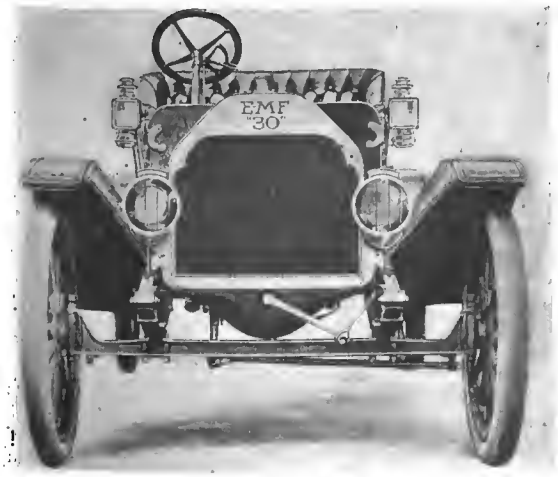
The car is carried on semi-elliptic springs in front and full elliptics in the rear, unusually large springs being specified for the car's weight. All driving strains and thrusts are taken by two radius rods. The frame is pressed steel of "U" section, the side members being perfectly straight throughout their whole length. Twelve-spoke artillery wheels are fitted, while 32 by 3 1-2-inch Morgan & Wright clincher tires on universal quick detachable rims form this part of the equipment. The makers of the new E-M-F, the title of which, by the way, coincides with the abbreviation for electro-motive-force, or *pushing power,* lay special stress on the grade of materials employed. The cylinders, pistons and exhaust manifold are of the best gray iron; intake manifold of brass, crankcase of aluminum, while the frame, gears, springs, axles and driving shafts are of special steels, heat-treated for the purpose in view.



Simplicity of the E-M-F "30" Magneto.

The wheelbase is 106 inches and the tread standard, while the weight of the car is 1,800 pounds. It is listed as a five-passenger touring car, a standard type runabout, single or double rumble roadster, or as a demi-tonneau, which is an E-M-F innovation, this making a smart-looking four-passenger car with detachable tonneau. With standard equipment, which includes a high-tension magneto, beside the usual outfit of lamps, horn, tools and the like, the E-M-F "30" lists at $1,200. It is licensed under the Selden patent, and is the lowest-priced car of its type in the licensed fold, and out of it as well.

In speaking of the new production, W. E. Metzger, secretary and sales manager of the company, states the interest created by the advent of the new car is unprecedented in his experience and the rivalry among dealers to obtain agencies is very keen. "In appointing agents," said Mr. Metzger, "I take into consideration: First, the reputation of the dealer for taking care of his customers. I believe that is the vital point. Then his financial standing. Third, whether he is willing to devote his entire efforts to pushing our product exclusively. I don't always make the last a condition, but it's a strong point in the applicant's favor. I have already signed up for some of the larger cities and I think the names of the concerns will be a surprise."



Front View of the New E-M-F "30."

Axle Construction as Seen from the Rear.

FRENCH MAKERS MAY NOW ACCEPT DISMOUNTABLE WHEELS

By W. F. BRADLEY.

PARIS, July 23.—Before the last of the racing cars had left Dieppe, the racing board of the French club had sent forth a notice calling its members together to consider what steps should be taken for the Grand Prix of 1909. The meeting, which is announced for next week, will have under consideration the regulations for the next annual event and will consider what offers of courses may have been made to it.

It is doubtful if any definite arrangements can be made until the international conference of Recognized Automobile Clubs has decided what rules shall be in vogue for next year, but it is possible for the French constructors to decide what they will support and to bring the matter up for decision at the first meeting of the European body. French constructors recognize that they have been beaten, some of them by the tire and rim element, others by defects in their over-speedy racers, and if early preparation can prevent a repetition of the disaster of July 7 the Frenchmen will certainly not be lacking.

Two possible changes present themselves: that the engine bore should be still further limited in order to reduce the speed to limits that tires can be reasonably expected to maintain, or to allow the use of dismountable wheels in order that it may be impossible for such accidents as happened to the Renault cars to again throw down an entire French team. The French sporting commission has a hankering after the highest speeds in order to impress the public; it will, therefore, hesitate to materially reduce the power of the cars. Some of its most prominent members have a deep-rooted objection to the use of the dismountable wire wheel, commonly seen on Brooklands track, and would not admit it except under strict necessity. But the necessity appears to have come in the last defeat. If dismountable wire wheels, therefore, or a change of wooden wheels under exceptional circumstances can save the situation, they will be allowed.

It is of some interest to note that the dismountable wheel, which is invariably of the metallic variety, originated in England, and since the opening of Brooklands track has been very prominently employed there for racing cars, the change of a complete wheel being effected in considerably less time than is necessary for the dismounting and remounting of a ready inflated tire and rim. As the hub of the wheel was never changed, only the outer shell being taken away, fastening being by means of a single key, the English claimed that the device should be admitted in the French race. To this, however, the racing board would never agree, maintaining that the wheel was a part of the car and as such should be rendered unchangeable.

Now that they have suffered defeat, very largely through their refusal to allow the changing of wheels, there is a sudden change of opinion, many of those in authority being willing to allow the use of the British device. It is never safe to prophesy, but the chances are that next year instead of rims it will be wheels that are changed, and one element of chance will thus be eliminated.

Dieppe has about one chance in fifty of again being the scene of a Grand Prix race. The district will certainly put in its claims and they will be considered by the club, together with probably fifty others; but as there is now no special love for the scene of their defeat, and as innumerable difficulties have arisen with the authorities on the question of roads and general organization, it is more than probable that a new site will be chosen for 1909. Happily there are so many of them in France that it is not merely a question of picking a good set of roads, but also of discovering which district can give the largest indemnity and assist most powerfully in the organization of the contest. The receipts this year were $100,000, and expenses $72,000, leaving $28,000 profit. Anjou is spoken of as a favored bidder for next year, but as yet, trying to name the course is mere quesswork.

FRENCH AUTOMOBILE EXPORTS SHOW A BIG SHRINKAGE

PARIS, July 23.—On the first six months of 1908 French automobile exports show a shrinkage of $1,882,600 compared with the corresponding period of 1907. The amount of business done with foreign countries is also slightly less than during the first half of 1906, but is considerably better than during January-June, 1905. Thirteen nations are on the French trading account, and of these eleven have reduced the amount of their orders during the period for which returns have just been made. Russia has increased her orders for French cars 257 per cent., and the colony of Algeria has also shown a considerable awakening. England, the most important customer of France, has cut down the value of her imports of French cars during this half year to the extent of $354,000. The loss here, however, is not great and can be accounted for by the general financial depression, the trading account with Britain still being better than in 1906 and 1905.

During the first half of 1906 the trading account with the United States was more than doubled. Since then, however, there has been a steady decline, 1907 showing a drop of $98,800 and 1908 a further decrease of $97,480, making a total fall over the period of two years of $196,280. During the first half of 1905 the French automobile bill stood at $558,600; the one for the current half year totals $991,400.

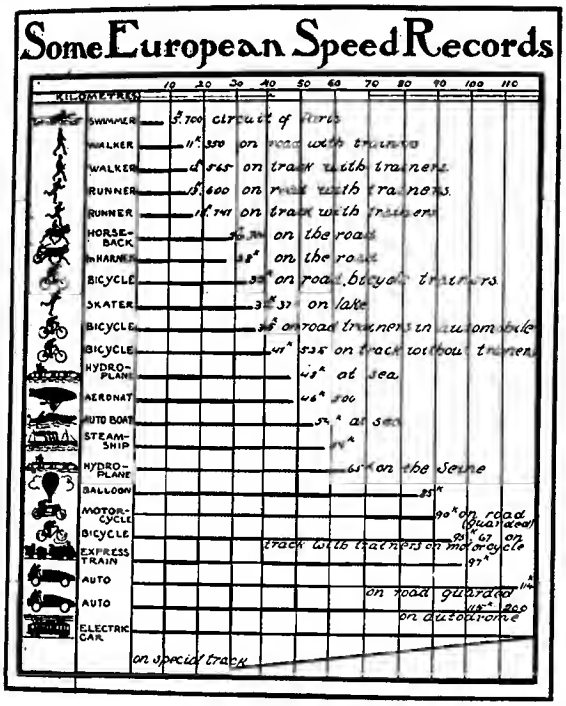
With Italy, Switzerland, Belgium and Germany the amount of business has dropped off considerably, and is not likely to be regained with either Germany or Italy. Spain may improve, and the whole of South America is looked upon as a field with considerable promise. The following table shows the amount of business done with the thirteen most important countries the initial six months of 1908 and 1907. The total does not accurately represent the French automobile exports, there being a number of other countries having small trading accounts which are grouped in the government report and are not included here.

Countries Showing an Increase.		
Russia	$166,600	$402,800
Algeria	352,800	467,600
Countries Showing a Decrease.		
Great Britain	$6,664,000	$6,210,000
Germany	1,741,200	1,372,000
Belgium	1,676,600	1,087,200
United States	1,088,800	991,400
Argentine Republic	660,600	491,400
Italy	441,000	236,800
Spain	419,600	372,400
Switzerland	417,600	205,800
Brazil	405,600	250,200
Austria Hungary	99,200	44,000
Turkey	10,800	10,000
Total	$14,034,400	$12,150,600

BLERIOT TAKES A TUMBLE.

Louis Bleriot, the French navigator, suffered his fourth or fifth smashup July 23 while making a trial of his new monoplane. Bleriot made several short flights that morning on the Issy les Moulineux grounds, and being apparently unsatisfied removed the machine to the shed. Practically all the spectators had left the field when he reappeared again at noon. He made a quick start and was soon well up in the air, traveling at about fifty kilometers an hour. Then, just after the first turn, a sudden gust of air twisted the tail of the machine skyward and Bleriot found himself sitting on the ground in a heap of wreckage.

The propeller of the machine was completely destroyed, the wheels damaged beyond repair, and the left wing crumpled into a shapeless mass. In fact, the tail was about the only part which did not show the effects of the tumble. Bleriot himself escaped without personal injury.



SPEED is a relative and mystifying thing. It is also a fascinating thing, else why the emotions which we all experience at a race of any sort, whether on land or water.

The late W. E. Henley sang a song of speed as a result of one of the too infrequent journeys which he had taken en auto, and Maurice Maeterlinck praised "the wonderful unknown beast" for its attributes as a conquerer of space.

The automobilist is generally decried—by those who are not themselves automobilists—as a speed fiend who drives to the common danger of all other classes of humanity, in all places and at all times. This idea is a fallacy, as is proved by the figures recently evolved by the Royal Automobile Club of Great Britain.

They sought to prove that a ten-mile-an-hour limit for automobiles was ridiculous when a horse-drawn omnibus was allowed to roll and career madly through London streets at 11.3 miles per hour, a cyclist at the rate of 15.85 miles, a private trap at 13.55 miles, and butcher's and baker's boys in their nerve-racking, rattling carts at any speed they could attain, frequently fifteen, sixteen, or even eighteen miles an hour.

The automobilist can get up speed when he wants to, but first, last and all the time he has his mechanical horse under better control than are the sorry hacks who draw the hansoms on the Thames embankment at fifteen miles an hour, or the electric trams which run out through Battersea or Hounslow at twenty miles an hour or more.

The fact that the automobile is as speedy a vehicle as it is speaks well for its controllability; otherwise, we should all have met untimely deaths before now. The opponents of automobilism seem to forget that there is often as much danger for the occupants of the automobile, when it arrives in a tight place, as for those on the road or footpath, or in another vehicle.

The comparative speed table reproduced herewith reduces the speed of modern locomotion in Europe to a common denominator, and should prove interesting to students of that all-important present-day question of roads and road-making and all that is thereto allied, and the question of speed and its relation to the needs of our modern life is a very potent one.

In a dozen years *"la vitesse"* in most forms of locomotion has been sensibly increased, and though the figures given are of European recorded records the comparisons hold equally good when viewed from either side of the big duck pond between us.

Billington, an Englishman, swam the Seine as it flows down through the very heart of Paris at a speed of 5.700 kilometers an hour, a water record that has not been approached.

Fantou, a Frenchman, made the circuit of Paris by road, on foot, walking, 36.600 kilometers in all, at an average gait of 11.350 kilometers an hour. Fantou also holds the European track-walking record of 12.565 kilometers an hour.

Loys, a Greek, ran 13.600 kilometers in an hour on the road—with trainers, and Schrubb, an Englishman, did 18.741 kilometers in the hour on the track, with trainers.

On horseback the record is 26.700 kilometers. It was made by Jobourg, mounted by the Marèchal de Logis, Peyraud, who also covered 100 kilometers—Brussels-Ostend—in 4 hours 15 minutes, an average of 23.500 kilometers an hour.

In harness, Prince, belonging to and conducted by A. Roy, made 28 kilometers in the hour, on the road between Nangis and Verneuil-l'Etang, near Paris.

Garin, a Frenchman, did 32 kilometers an hour on the road with bicycle trainers.

Troning, a Norwegian, comes next in point of speed with 32.370 kilometers to his credit, a skating record made on the ice of the lake at Davos, Switzerland.

The road bicycle record, paced by an automobile, 35 kilometers an hour, was made by Huret, a Frenchman, on the Paris-Bordeaux road, 594 kilometers being covered in 16:35.

The bicycle track record, without trainers, belongs to Berthet, 41.525 kilometers. This beats Petit-Breton's record of 41.110 kilometers.

The hydroplane record (a *bateau-glisseur* which just skims the surface of the water, its power coming from a gasoline motor) the invention of Comte de Lambert, is 48 kilometers an hour, made off the coast. In the sheltered waters of the Seine below Paris a speed which worked out at 63 kilometers an hour was attained for a short distance.

The aeronaut or dirigible balloon record for the hour seems still to rest with Count Zepplin's airship, Zepplin, 350 kilometers in 7 hours 30 minutes. This equals 46 kilometers an hour.

The motor boat record, that of the Lorraine-Dietrich belonging to Perigon, is 54 kilometers. It was made in Normandy.

The passenger-carrying steamship record belongs to the *Viper*, a cross-channel boat between England and France; 32 knots in the hour, equalling 59 kilometers.

The balloon record for speed is undoubtedly that made by the Hirondelle in 1887, when the formidable *vitesse* of 145 kilometers an hour was attained between Saint-Denis and Neuilly-Saint-Front. Eighty-five kilometers were covered in 35 minutes.

The motor-cycle record, on a road guarded by national troops, is held by Bucquet, 202 kilometers in 2 hours 12 minutes, the equal of 90 kilometers an hour.

The bicycle track record, paced by motorcycles, belongs to the Frenchman, Guignard, 95.67 kilometers in the hour.

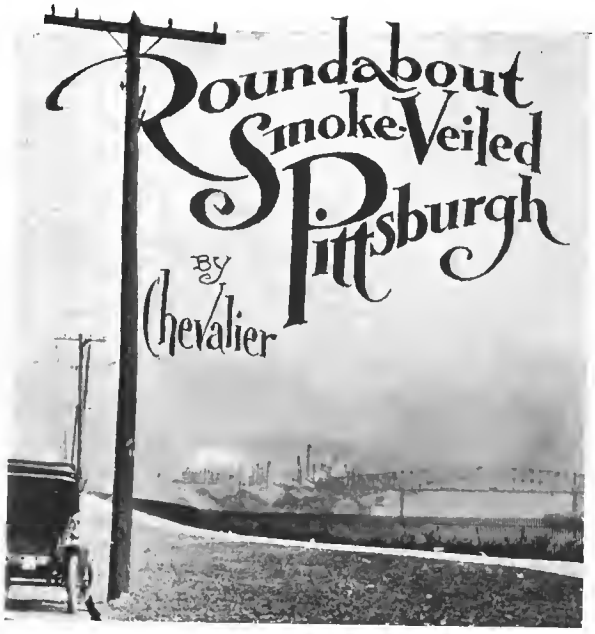
The express train record is that of the run from the Paris Gare du Nord to Amiens (the Paris-Calais Rapide). The 131 kilometers take 1 hour 35 minutes, or 131 kilometers an hour.

Automobile records in general are apt to be things of dispute these days, but the following are unquestionable recorded times, which may or may not be records in the light of the personal knowledge of other phenomenal, if seemingly fantastic, results achieved by the modern speed king, the automobile. In the Grand Prix race of 1907, on the Seine-Inferieur circuit, Nazzaro on a Fiat averaged 114 kilometers an hour for the entire distance. On June 9, 1908, the same driver and car went over to England in answer to S. F. Edge's challenge and set up a record for the Brooklands track of 120 miles—184 kilometers—an hour, over a total distance of 271-2 miles. Nazzaro deserves additional credit for this performance on account of his unfamiliarity with the course and the necessity of carrying a mechanician.

The Siemens-Halske electric car, on a section of specially laid track between Berlin and Jossen, made 210 kilometers an hour.

Roundabout Smoke-Veiled Pittsburgh

By Chevalier



A Haze of Smoke Obscured Our View of the City.

READERS of Daudet will remember that Tartarin de Tarascon was made up of two diametrically opposed temperamental halves. He was a combination of Quixotic love for travels and adventure on the one hand, and Sancho Panzaic love for home and comfort on the other. Quixotic Tartarin would say to himself: "Sally forth into the world of adventure and cover yourself with glory." Sancho Tartarin would whisper: "Stay at home and cover yourself with flannel."

The writer confesses to a similar make-up. Maps are studied, road books are read, and a trip is laid out months in advance, with all the pleasures of anticipation.

When the time of departure arrives, Sancho has his innings, and a debate arises. What about changing tires in the mud and rain? What if we should get "hung up" in the mountains with major mechanical troubles or with a leak in the gasoline system? What about having to sleep out in the machine on the mountain? Would it not be more comfortable to sit under the shade of our own big white oak, and read and doze? Usually the Quixotic half comes out ahead, and we pack our luggage in the hamper, fill the lunch basket, and we are off.

But once a compromise was struck between the Sancho and the Quixote halves, and the trip over the rough and rugged roads of the Allegheny mountains was abandoned for a delightful little run around near by, where "home, sweet home," can be reached quickly, whether the machine is willing or not.

Passing through Bellevue, where property is worth $300 a foot, and where the streets are so bad that your teeth are almost shaken out of your head, we cross the Allegheny river, and wend our way through the grime-laden atmosphere of Pittsburg. We pass the Carnegie Institute, and take off our caps and bow to the genius of the man who can earn a million dollars a week while playing golf four thousand miles away. We pass over the smooth roads of Schenley Park, whose beautiful green grass and foliage are turned brown, and, in some places, black, by the grimy, brown, ore-laden atmosphere, polluted by the mills which have made Pittsburg. We speed on, that we may the sooner rid our lungs of the filthy atmosphere, and fill them with the pure air of the open country.

We keep the speedometer right up to the legal point. If it passes it, it is because of the vibration of the machine. We hurry through Highland Park, over the Allegheny river, and, taking the Evergreen road, we are soon among the beautiful hills and fields of Western Pennsylvania. We then turn into the Perrysville plank road, and, going east, we turn down into the Lowries run road. We bowl along, coasting over this smooth, newly improved highway, and our Quixotic half has his innings. Is this not better than sitting at home reading about some other fellow's trip?

When we get to the next hill, however, some misgivings arise. Our power is nearly gone. The vehicle is not running hard, for it just coasted beautifully, even on the less steep portion of the down grade. The motor does not seem to be skipping, and, to make sure, as well as to see if the muffler is choked, we open the cut-out. There is no skipping, the explosions are very weak, and cutting out does not increase the power. The gasoline valve on the carbureter is opened and closed slightly without any effect. The dry cells and storage battery both are in good condition, and both give equal results. The valves are tight, their lift is right, and the compression is good and equal.

Here is a bad state of affairs. We are on a valley road, in a pocket, to get out of which it is necessary to climb some steep hills. We must fix things or abandon the machine and "hike" five miles in the blazing hot sun. Sancho Panza says: "I told you so." We sweat for an hour trying to locate the trouble, and then sit down to think and reason, and to allow the motor and ourselves to cool off. We now do what we should have done in the first place—make a diagnosis.

We have made the same blunder that is made in most repair shops, where they take a machine all apart to find the trouble, instead of reasoning out the probable source of the difficulty. They do an exploratory operation instead of making a diagnosis. We reason that the weak explosions heard when the muffler was cut out could not have been from faulty carburetion or there would have been at least an occasional skip. Could there be an obstruction in the exhaust pipe? The symptoms were so like a choked muffler, except the failure to cure by the opening of the cut-out.

By this time the exhaust pipe is cool, and when we take it apart and find a piece of a baffle plate choking it up almost completely, we remember that after coasting that last hill we had a terrific explosion in the muffler because we failed to close the throttle when we shut off the spark.

We connect up the exhaust pipe, wash off the grease and dirt in the stream, brush our clothes, start the motor, and hear with

After We Left the Din and Grime of the Iron Mills.

A Pennsylvania Oil Producer's Home and Derrick.

Shagbark Cottage Which Delighted Sancho Panza.

joy the deafening cannonading of the cut-out explosions. Never was noise more musical to the trained automobile car than that.

We bowl along through the valley, crossing and recrossing the brook. We come to a sudden ending of our smooth macadam, and bump along over the rough clay, just dried after recent rains. It is one of the galling things to a Western Pennsylvania autoist that all good roads lead to bad ones. Allegheny county has been improving roads in patches here and there, so that only a few continuous miles are yet available.

Soon we come to something worse. The Telford foundation has been laid, sharp stones on edges, but the top layers of broken stone have not been added. This is ruinous to tires, but, hoping it will end at every turn, we keep on, still thinking that it is a farther escape backward than forward. After four miles have been traversed, we come to an utterly impassable road. We think of the four bad miles behind us and no extra casing along. Sancho Panza says: "I told you so." Fortunately, we discover a side road, which we take, over steep hills, through muddy, swampy, shaded valleys, where the sun has not yet had time to dry out the roads.

We pass through old fields, where black old derricks a quarter of a century old, still stand, the wood preserved by the oil sprayed over the structure when the "gusher" was struck that made the owners wealthy at the rate of hundreds of dollars a day, a man's capital being figured in barrels of oil.

Soon we reach the Perrysville road, on which we turn homeward. After a good dinner, both Quixotic and Panzaic halves are satisfied by the pleasure of the summer afternoon's trip.

THE MICHIGAN CONSTABLE TRUST.

A party of amateur Sherlock Holmeses, while on an automobile tour through Michigan, succeeded in unearthing a copy of the rules in force among a certain band of constables operating there. By what devices and underhand methods it was obtained there is no need to relate. All autoists who intend to visit that State should read the rules and be prepared with the necessary equipment. They are:

1. On discovering an approaching team, the automobiliet must stop offside and cover his machine with a tarpaulin painted to correspond with the scenery.
2. The speed limit on country roade thie season will be secret snd the penalty for violation will be $10 for every mile an offender is caught going in excess of it.
3. In case an automobile makes a team run away, the penalty will be $50 for the first mile, $100 for the second mile, $200 for the third mile, etc., that the team runs, in addition to the usual charges for dsmsges.
4. On approaching a corner where he cannot command a view of ths road ahead, the automobiliist must stop not less than 100 yards from the turn, toot his horn, ring a bell, fire a revolver, hailoo, and send up three bombe at intervals of five minutes.
5. Automobiles must be seasonably painted—that ie, so they will sgree with the pastoral ensemble and not be startling. They must be green in spring, golden in summer, red in autumn, and white in winter.
6. Automobiles running on country roads at night must send up a red rocket every mile and wait ten minutes for the road to clear. They may then proceed carefully, blowing their horns and shooting Roman candles.
7. In case an automobile comes up behind and wants to pass, the farmer will affect deafness until the autoist calls him a hard name, and will then enter suit for defamation of character.
8. All members of eociety will give up Sunday to chasing automobiles, shooting and shouting at them, making arrests, and otherwise discouraging country touring on that day.
9. In case a horse will not paes an automobile, in spite of the scenic tarpaulin, the automobilist will take the machine apart as rapidly as possible and conceal the parts in the grass.
10. In case an automobile approaches a farmer's house when the roads sre dusty it will slow down to one mile an hour and the chauffeur will lay the dust in front of the house with a hand sprinkler worked over the dashboard.

LEGAL DECISIONS OF IMPORTANCE.

NEW YORK, July 27.—Two decisions that have been handed down during the past week or so by the courts in this jurisdiction are of considerable interest and importance to automobilists at large. Probably the one that will come in for the greatest commendation was the sentencing of Charles McLeod, a Brooklyn chauffeur, to six months in the penitentiary by Judge Norman S. Dike, for what is most familiarly known as "joy riding." It happened to be the second occasion on which McLeod had taken a machine from the garage at which he worked for the purpose of showing some of his friends how fast he could drive, and in each instance he ended by demolishing the car. He pleaded guilty to grand larceny in the second degree.

The second decision is by the Appellate Division of the Supreme Court, and is to the effect that the owner of an automobile is not responsible for damages inflicted by it upon a third party when in the hands of his servant for the latter's personal convenience. This was rendered in the case of Cunningham *vs.* Castle, which was an action brought to recover damages for injuries sustained by being run down by the defendant's automobile while under control of the driver, Henry Boes, for his own purposes. In the lower court the jury found for the complainant, but the Appellate Division reversed this and ordered a new trial, Justices Clarke, Ingraham and Scott concurring, while Justices Houghton and McLaughlin dissented.

TOLLS DOUBLED ON A MARYLAND TURNPIKE.

BALTIMORE, July 27.—The toll charge for automobiles has been doubled by the Frederick and Jefferson Turnpike Company, whose road runs between the city of Frederick and the village of Jefferson. This road is one of the best-kept highways in the country and the officials claim that the autos cause great harm to the pikes. The advanced rate will make the charge for two-seated autos 32 cents. The road is eight miles long, so that the cost per mile will be four cents.

THE AUTOMOBILE

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A TOUR THAT UNDENIABLY DEMONSTRATED.

When 28 automobiles out of 46 can travel 1,675 miles in 12 days, observing a schedule that demanded much over roads fluctuating suddenly from excellent to vile, and receive attention from driver and mechanic limited to the use of parts carried on the vehicle, the percentage of clean-score finishers supplies a demonstration of the American automobile that should be acceptable even to those few skeptics who have been waiting for public proof that the new means of individual transport had reached that stage of perfection which would commend it to all as reliable and assured for short and long hauls.

Surely even the most exacting could not ask anything more convincing than what was accomplished by the automobiles participating in the "fifth annual reliability touring contest" of the American Automobile Association, and it should be here mentioned that, besides the perfect-score brigade, the survivors of the hardest test ever asked of motor-driven vehicles, either here or abroad, included others which fell short of a clean-score record by margins so scant that they are entitled to almost equal credit. When one adds a half dozen official and press cars which practically duplicated what had been done by the contestants, the reliability showing gains more in the fullness of the measure.

Automobile endurance runs are sporting propositions only in a minor sense, and the general public is mainly interested in being informed as to what cars have met the extraordinary touring conditions called for. If more than one car answers these requirements, the interest of the automobile-buying public is that much increased, for the greater number of clean-score participants—providing the contest is one really deserving of the name—makes evident the reliability of automobiles as now produced.

It is a fact, however, that a certain percentage of the public are particularly interested in any sort of a contest, human or mechanical, or combining both, and to satisfy these it may or may not be advisable, according to the viewpoint, to continue an automobile endurance run until a winner is evolved for any trophy which may be offered.

If independent owners, for their own sporting amusement, were the only entrants in automobile contests of a reliability nature, and insistent upon a fight to a finish, a single winner would be a natural sequence. But it is the makers themselves who now pay the heavy bills, and, having met the extraordinary touring conditions by participating in a reliability contest, they are entitled to a reasonable amount of unquestioned publicity for having successfully passed the hard mechanical examination.

Therefore, while it might be a matter of interest in some quarters, it would seem that it really mattered little whether or not the tie was decided in the matter of holding the Glidden trophy, for, if no club team won it, it naturally reverted to the A. A. A. touring board, to be held until the contest of another year. To have penalized a car at the conclusion of the tour because it checked in a minute earlier than it was required to do would have been action somewhat unusual when all attendant circumstances explained elsewhere were taken into consideration. The most scrutinizing discoverer of technicalities might so rule, and he would find those who agreed with him. But a common-sense interpretation of the incident would not have blackened the otherwise faultless mechanical record of the car for such a palpable and indirect error in mathematics, which, if it gained nothing for the car, certainly should not have counted against it. It might be said, too, that a rule of this indefinite sort might better be left out of future conditions of endurance runs.

If winners must be had at the conclusion of endurance runs, they can be more sensibly obtained by an examination of the cars, letting general condition decide any ties which may exist.

The tour told a story full of praise for the endurance qualities of American automobiles, and a sporting sequel may or may not be a necessity, according to the manner in which one looks at the proposition as a whole.

It is now plainly apparent that the American automobile has risen superior to any prolonged contest conducted over American roads with due observance to the existing laws. And its ability thus demonstrated is greatly in excess of anything which it might be asked to perform in its use even by an owner who might demand much more than would the average autoist, who does not expect to utilize the highways as a race course.

Exactly what sort of a contest should be planned for next year is a matter requiring most careful consideration. It would seem a likely proposition that the tour of 1909 should be held somewhere in the center of these United States, where automobiling has not yet lost its recently gained newness, and where roads are scarcely such in name.

ASK FOR ROADS TO COMPLETE VANDERBILT CUP CIRCUIT

PROGRESS on the 12-mile stretch of the Long Island Motor Parkway, between Central Park and Meadow Brook, has so far advanced as to positively insure its completion for the Vanderbilt Cup race and justify the commission is going ahead in securing the use of the existing highways to complete the 30-mile circuit.

Accordingly, on Tuesday last A. R. Pardington, on behalf of the Vanderbilt Cup Commission, made to the Board of Supervisors of Nassau county formal application for permission for the use of about a score of miles of the county roads in the towns of Oyster Bay, Hempstead and North Hempstead for elimination trials between 5 and 10 o'clock on the morning of Saturday, October 10, and for the Vanderbilt race itself on Saturday, October 24, from 5 A.M. to 3 P.M.

The board has set Monday, August 3, at 10 o'clock in the morning, for a public hearing at the courthouse at Mineola. In view of the fact that permission has readily been granted for previous Vanderbilt races, and in the face of the undisputable eagerness of the Nassau county citizens for the running of the race, with its attendant liberal pouring of the fraternity's money into the county, there seems to be little doubt of the desired permission being granted. In its application, filed at Mineola, the Cup Commission outlines the course desired as follows:

Beginning at the Round Swamp road at or near the juncture with a road known as the Manetto Hill road to Plainview, thence on a straight road to Woodbury and east along the Woodbury road to a point or juncture of the Woodbury road with the Jericho turnpike, over the Jericho turnpike west to Jericho village, thence south from Jericho village, on the Massapequa-Oyster Bay road to its point of juncture with the Jericho turnpike, thence west over the Jericho turnpike to the old Westbury road, thence south to the Old Country road and easterly along the Old Country road to Merrick or Whale Neck avenue; thence along Merrick avenue to a point about 400 feet north of the Central branch of the Long Island Railroad to the roadway of the Long Island Motor Parkway.

Though entries for the Vanderbilt Cup race do not close until September 1, with the privilege of making nominations up to October 1, the commission has received ample assurance of a representative field of American contenders, and is confident of a sufficient number of competing foreign cars to preserve the international character of the race. Entries are now being made.

Robert Graves, a member of the commission, who has purchased the Mercedes which won this year's Grand Prix, has not yet made known his intentions as between substituting the newer car for Janatzy's Mercedes of the 1906 race already entered by him, or putting the Grand Prix winner in as an additional entry. A six-cylinder Mora has already been entered.

An announcement was made Tuesday of the entry of a special Chalmers-Detroit of 50-horsepower, it being entered in the name of J. S. Harrington, of the Worcester Automobile Club. The car will be driven by Oliver Light, who is well-known.

The nomination of two Locomobiles and two Thomas cars seems assured. There are also in circulation reports of intended entries of an Apperson, an Acme, a Chadwick, a Frayer-Miller and two more Chalmers-Detroits by their makers.

FRENCH CLUB AT WORK ALONE ON 1909 RACE RULES

PARIS, July 23.—The absence of two of its most prominent engineers, Louis Renault and Henri Brasier, was largely responsible for the Racing Board deferring its decision on the regulations for the 1909 Grand Prix at the meeting this week. The gathering of the Racing Board, the first since the Dieppe event, was occupied in talking over the situation for next year, but was not productive of any important decision. It was decided in principle, however, that there should be a race in 1909, thus putting an end to the rumors that, as the result of the recent defeat, the Grand Prix would be abandoned.

In all probability a decision regarding next year's regulations will be made within a week, the intention of the Commission Sportive being to announce the conditions and place of the race practically twelve months in advance, so that constructors will have an opportunity of preparing well ahead and of testing the actual racers on the course before it is closed for the necessary repairs prior to the race.

Regarding the rules to be adopted, there is complete confusion at the Commission Sportive. A still further limitation of the bore in order to reduce speed to the limit which tires can reasonably be hoped to maintain is strongly supported. On the other hand, M. Arnoult, the vice-president of the technical board of the club, declares in favor of full liberty, maintaining that the tire element alone is sufficient check upon exaggerated horsepower. The recent race is an argument in favor of M. Arnoult's theory, the fastest cars in the Grand Prix all being killed out as the result of tire trouble caused by their excessive speed.

There is something of an anomaly in the Racing Board of the French Club seeking to settle the rules of the race without any reference to the other members of the International Association of Recognized Automobile Clubs. The burlesqueness of the situation does not even escape the Frenchman, who asks why, after so strongly protesting the independent rules of the Vanderbilt race, the Commission Sportive should meet with the avowed purpose of drawing up rules for its 1909 speed test, which will not be in conformity with the decisions of the Ostend conference. Doubtless the Belgian decision of 1907 was only intended to apply to the races of 1908, but if it needed the combined clubs of Europe to formulate a set of rules for the present year, why should a single club usurp that power for 1909; the fact that it is anxious to make early arrangements is not sufficient excuse for the irregularity.

Despite the serious drubbing that the Dieppe district has received at the hands of the French club, the Norman authorities have boldly come forth with a request for the race to be held a third year in their district. The chances are that the request will be turned down without thanks. Drivers still remember that a few of their number had to spend a day in jail for exceeding a ridiculously low speed limit, and that others had to meet fines for exceeding 15 miles an hour with cars that could not be throttled down to such a crawl. The Racing Board is sore over the bad condition of the course and the stupidity shown in the tarring arrangements, while the treasurer is not likely soon to forget that the Prefect of the district demanded 734 free grandstand seats for himself and his friends, and thereby reduced the profits by $6,036.

There are half a dozen districts ready to make every sacrifice to secure the 1909 race, the favorite for the moment being the Anjou district, a few miles to the west of Tours, and on the border of the beautiful chateau country, well known by all foreign tourists. A strong argument in favor of the district is a subvention of $20,000.

Though all the accounts are not yet in, it is estimated that the recent race will leave a profit for the Racing Board equal if not greater than that of the 1907 event, despite the reduction of the town indemnity from $20,000 to $10,000.

The voiturette race of itself, though well attended, was not sufficient to make expenses.

BAD WEATHER MADE OSTEND MEET TIMES SLOW

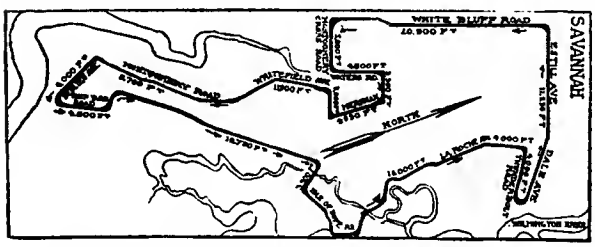
OSTEND, BELGIUM, July 23.—Rain spoiled the last day of the Ostend meet, which in the past has been famous for the breaking of records. When the powerful Grand Prix cars lined up for their fling at mile and kilometer distances the wind was blowing half a gale and the rain was descending in torrents, with the result, as can readily be supposed, that no record went by the board during the 1908 gathering. The Belgian method of making mile and kilometer tests is for the cars to cover the distance in both directions, the times being totalled and the average maintained as the official performance.

Hautvast, who handled the Bayard-Clement 155 millimeter machine which fell down on him in the Grand Prix, made the fastest time on the flying kilometer, his total time for the two tests being :45 2-5. Rigal, also on a Bayard-Clement, took second place with :46 4-5; Gabriel on the Grand Prix Mors was clocked in :49 2-5; S. F. Edge's six-cylinder Napier could not do better than :50 4-5, and De le Marra's Fiat finished in :55 1-5.

For the mile test, standing start, Hautvast again scored, his Bayard-Clement covering the double distance in 1:33 4-5; Gabriel ran the Mors into second position with 1:39 3-5; Rigal got third place for the Bayard-Clement with 1:48, and De la Marra was again tail-ender on the Fiat with 1:59.

COURSE ANNOUNCED FOR SAVANNAH RACE.

The Automobile Club of America has definitely announced at Savannah, Ga., the course for its "Grand Prize of America," and work has been started to prepare it for the race. The course is 26.73 miles long, and will be covered fifteen times, making a total distance of 400.85 miles. While the road surface is undoubtedly excellent, no record-breaking speed can be expected on account of the great number of turns. There are at least a dozen right-angled corners, and two or three even sharper; the longest straightaway stretch is about two and a half miles. An elimination race may be held three days before the main event, as the A. C. A. officials expect will be necessary, and a proposed 200-mile light car race is talked of the day before.



Route of "Grand Prize of America" Course at Savannah.

The course will be patrolled by State militia and a detail of police, and if these repeat their good work of last year there should be no trouble from the crowds. The present grandstand holding 8,000 persons will be enlarged, with ample parking space nearby. All information concerning hotels and boarding-houses will be furnished through a special bureau.

AERONAUT FARMAN ARRIVES IN NEW YORK.

When the *Touraine* steamed into New York harbor last Sunday morning with Henry Farman on board it was met by an enthusiastic delegation from the Aero Club of America, who transferred the aviator to their tugboat and escorted him to the Hotel Astor. Later in the day Mr. Farman went out to the Brighton Beach race track, where the flying exhibitions will begin August 1, and looked over the ground. He seemed very much pleased, but took occasion to warn his companions not to expect him to fly away over the housetops or soar into the clouds, for developments had not reached that as yet.

"We must remember," said Farman, "that there is a great difference between the aeroplane and the dirigible balloon. At present the latter has the best of it, at least from the spectacular side, but there is no doubt that the aeroplane will prove far superior as its development progresses. I always go upon the principle, however, that it is better to be a live experimenter than a dead dare-devil." Farman's machines arrived on the *Kroonland* and were immediately transferred to Brighton Beach, where they will be set up at once.

RACE PROMOTERS CASH A $7,000 RAIN BET.

It will be remembered that the coterie of multi-millionaire racing enthusiasts summering at Long Branch resolved to take no chances of unfavorable weather making the meet they promoted at Elkwood Park, on the Fourth of July, a financial failure, hit upon the expedient of insuring themselves against a storm on that day. Accordingly, by the payment of $1,400 premium, they secured at the Lloyds', in London, insurance to the amount of $7,000 against one-tenth of an inch rainfall on that day. The promoters were easy winners of the 5 to 1 bet.

The Vanderbilt Cup Commission has invariably insured itself against damage suits, and similar insurance was taken out by the Briarcliff race promoters.

In view of the outcome of the precaution taken by the Long Branch race givers, it is not at all unlikely that in future many of the big automobile events will be thus insured against financial loss. Race promoters, grandstand builders and other holders of privileges will probably seek the Lloyds to make their good things sure things.

INDIANA'S GOVERNOR IS CONSERVATIVE.

INDIANAPOLIS, IND., July 27.—The rumor reached here last week that Indianapolis is in a fair way to get the American automobile derby to be run under the auspices of the Chicago Automobile Club. The only thing in the way, it is said, to prevent the State from getting the race would be the refusal of Governor J. Frank Hanly to lend the services of the State troops to police the course. The Governor has been on a lecture tour for several days and has not been seen on the subject so far. However, it is believed that he would not consent to the State troops aiding such a race, as he is decidedly conservative.

It is reported that a 26-mile course in the vicinity of Crown Point in the northern part of Indiana has been decided upon, and it would be necessary to have the military forces patrol the course to prevent accidents to spectators.

CALDWELL, VANDERBILT PUBLICITY MAN.

Henry Caldwell, whose "Gasoline Gossip" column in the New York *Evening Telegram* attracted widespread notice during its printing, has taken charge of the publicity department of the Vanderbilt Cup race, which means that the work will be exceptionally well done and satisfactory generally to all newspaper men. Mr. Caldwell's office will be at 437 Fifth avenue, New York City, in a room added to the A. A. A. headquarters.

MARYLAND STARTS ROAD IMPROVEMENT WORK.

BALTIMORE, MD., July 27.—Routes for improved highways in Calvert and St. Mary's counties, in southern Maryland, have been selected by the Good Roads Commission. This is the first move for the construction of the system of State roads for which $5,000,000 was appropriated by the Maryland legislature.

THINGS DOING AMONG THE AUTO CLUBS

ATLANTIC CITY CLUB FLAGS THE FLAGGERS.

ATLANTIC CITY, N. J., July 27.—Automobile travelers approaching this city, from whatever direction, will find the roads patrolled by county constables. To offset these pests, the Atlantic City Automobile Club has established counter-patrols, each man armed with a huge yellow flag bearing the emblem in black letters, "Police trap ahead—slow down." The business of the yellow flagmen will be to locate the traps and station themselves accordingly—moving from place to place with the Vidocqs and checkmating them at all times. The yellow-flaggers have been on duty but a few days, yet in that short time they have done excellent work—so excellent, in fact, that they have aroused the ire of the constables, who threaten to nab them if they interfere with their legitimate prey. So bitter has the feeling of the cops become that they threaten to even cause the arrest of the Atlantic City club officials on the charge of obstructing justice and abetting violations of the law. Certain it is that the arrests of automobilists during the past week have practically ceased.

A number of Chelsea cottagers, whose business takes them to Philadelphia every day, have organized an exclusive motor club which they call the "D-T Association." (They are kept constantly busy explaining that the initials stand for "Daily Trips" and not "Delirium Tremens.") The "D-T's" go to and from business each day in their cars instead of patronizing the railroad's flyers and find the scheme highly enjoyable. Traveling together, any breakdown likely to result in delay is discounted by the owner getting into another car and leaving his own car in charge of a chauffeur, who, after fixing the car or getting it fixed, brings it on to its destination, where its owner finds it ready for him.

ARREST OF A CLUB'S SPAGHETTI SCATTERER.

COATESVILLE, PA., July 27.—But eleven of the expected half a hundred cars participated in last Saturday's endurance run of the Automobile Club of Chester County, because of a dispiriting all-day downpour. The course was to Oxford and return—about 80 miles—and the roads were hub-deep in many places. The competitive feature of the affair was practically abandoned, and the run home degenerated into a flounder, which resulted in a pair of Buicks—John Boyd's and Dr. H. S. Scott's—finishing first and second, with J. H. Maynard's Ford third.

The contestants were hot over the arrest of the pilot, Walter L. W. Jones, in West Chester, for scattering confetti at the turns. The cleanly officials asserted that Jones had "cluttered up the streets with his d——d paper," and the culprit was mulcted a five spot by Burgess Reid. Jones stripped off a twenty from a fat roll, and the burgess had to run all over town to get it changed. The run was almost on his heels when he got away.

JERSEY CLUB WILL RACE AND PROTEST LAW.

WILDWOOD-BY-THE-SEA, N. J., July 27.—There will be a great gathering of automobilists here on Friday evening, July 31, to protest against the many injustices of the New Jersey motor law. The affair will be under the auspices of the Motor Club of Wildwood, and the date was selected on account of the great influx of motorists expected here to witness the "sprint" races on the Central avenue boulevard the following afternoon. The meeting will be the first gun in a strenuous campaign of the motor clubs and hotel keepers against the Frelinghuysen law, which, while proving decidedly obnoxious to motorists, especially those from outside the State, has taken thousands of dollars from the pockets of the seashore bonifaces, who complain that automobile travel has fallen off 50 per cent., as compared with last year—this, notwithstanding that with the marvelous growth of the sport elsewhere, a 50 per cent. increase could have been otherwise looked for.

The three Philadelphia clubs are taking a lively interest in the meeting, and are endeavoring to secure a big turnout of their members. "Charlie" Swayne, former president of the Quaker City Motor Club, now lives here, and has guaranteed a big representation of his clubmates. The Philadelphia and Germantown clubs will also be largely represented, while there will be delegates not only from every automobile organization in southern New Jersey, but from every club within fifty miles of Philadelphia. Northern New Jersey and New York have also been invited to send representatives.

The Wildwood protest, it is understood, will be followed up in September by a similar meeting in Atlantic City, under the auspices of the Automobile Club and the Hotel Men's Association of that resort. To the latter gathering every club in the New Jersey federation will be invited to send delegates. It cannot be denied that the Frelinghuysen law has kept automobile tourists out of the State. It is apparent to everyone in any way connected with the business in the south Jersey shore resorts.

Next Saturday's races—the affair is officially termed "The Midsummer Meet"—promises to be even more successful than those held on the glorious Fourth. The numerous events elsewhere kept down the entry list on that occasion.

Third Annual Outing Given by the Ontario Motor League to the Orphan Children of Toronto, Friday, July 10.

ANOTHER CLUB IN WESTERN NEW YORK.

BATAVIA, N. Y., July 27.—The autoists of this city have organized a club and elected the following officers: President, Arthur G. Hough; vice-president, Raymond M. Walker; secretary and treasurer, E. Dean Hickox; executive committee, the officers and Charles Shaul, W. W. Kinne and J. W. Leseur. Nearly fifty business and professional men stand ready to join and a meeting will soon be held to complete the organization.

AUTOMOBILE INTEREST AROUND MASON AND DIXON'S LINE

By F. S. SLY, Traveling Correspondent for the Automobile.

ROANOKE, Va., July 25.—Roads in this part of Virginia are only fair, but Roanoke lies within four miles of the through road leading from Hagerstown, Md., to Bristol, Tenn., a stretch of macadam that is fully 300 miles long, so that autoists are not at a loss for a stamping ground. It is evident that interest in automobiling is growing apace here, as the Roanoke Automobile Association has just been organized with J. H. Marsteller as president, and C. M. Arms, as secretary and treasurer, and as there are now about 75 resident owners of machines in the city, the association will have plenty of material to draw on for its charter membership. While the through road not only offers a long stretch for pleasure runs, but also serves as a convenient connecting link between many small places in this part of the State, it does not naturally take the place of the network of good roads between places of importance and out in the open, that every part of this country should be able to boast, so that the new association will begin to make its influence felt in this direction as soon as it gets under way.

Dealers here report that business has been good during the present season, and still continues so, buying in this part of the country not being confined to the opening of the fair weather season by any means. There are two good garages, the Virginia Motor Car Company, representing the Maxwell, operating one, while the Roanoke Automobile Company, which handles the Rambler, Ford and Buick, runs the other. In addition to these, J. F. Munger & Son represent the Reo.

Harrisburg a Strong Automobiling Center.

HARRISBURG, PA., July 28.—For its size, this city can well lay claim to being one of the best populated in the East, from the automobile point of view, there being about 500 cars in use here. This, in spite of the fact that there are but few good macadam roads in the county, the only ones of importance being those leading to Reading and to Gettysburg, both of which are very popular runs. The remainder of the roads roundabout are only fair and offer but small inducement to the autoist who does not have to use them from necessity or convenience. The chief factor in the fostering of automobile interest here is the Harrisburg Motor Club, of which Vance C. McCormick is president, J. C. Michener, treasurer, and J. Sidney Sible, secretary..

American Mors taxicabs have been introduced here, six of these cars now plying regularly for hire, while it is noticeable that a number of the city's business houses have gone in for commercial vehicles, as quite a few automobile trucks of various sizes and styles are to be noted in service. There are several up-to-date garages and quite a number of well-known American cars are represented, the Harrisburg Auto Company handling the Rambler, Ford, Reo, White, Peerless, Stoddard-Dayton and Stanley, while the Central Pennsylvania Auto Company has the Cadillac and the Buick, and the Keystone Motor Company represents the Pullman, Jackson and Atlas. All of the above maintain garages, while Andrew Redmond does an agency business, handling the Maxwell and the Columbus electrics. Business is reported as good by all the dealers, but not quite up to the mark set by last year, which was the best the trade here has had.

Nation's Battle-ground a Place of Fine Roads.

GETTYSBUGG, PA., July 27.—There are few more attractive places to the autoist than the National Park here, not only from its historic and scenic interest, but from its network of fine macadam roads over which the visitor can easily reach all of the prominent features of the far-stretching battle-ground over which the most decisive encounter of the Civil War was fought. Autoists who tour anywhere in Pennsylvania within striking distance of Gettysburg seldom fail to make a detour to take in the sights of the battle-field with its endless monuments and tablets erected to commemorate the valor of those who gave up their lives in the three-day fight, and it goes without saying that this number would be vastly increased could the field be reached by good roads from any point of the compass. The Lincoln Memorial road, now in course of construction and which will connect Gettysburg with Washington, should be the cause of bringing a large number of visitors from the National Capital.

Flourishing Clubs in Small Pennsylvania Cities.

WILLIAMSPORT, PA., July 27.—There are only a few paved roads in this section of Pennsylvania, but the common dirt roads are good during the summer and fall, which probably accounts for the unusually flourishing condition of the Williamsport Automobile Club. This organization is headed by W. C. Riley, president, the other officers being Charles D. Wolf, treasurer, and F. G. Sweet, secretary, and it now has 80 progressive autoists on its membership roll. The club does a great deal to foster interest in automobiling and is deservedly prosperous, its annual hill-climb and race meets being events of importance in this part of the State. Its membership is rapidly on the increase, and it is making its influence felt for the betterment of the roads and autoing conditions generally.

INDIANAPOLIS INSISTS ON REGISTRATION.

INDIANAPOLIS, IND., July 27.—The Indianapolis authorities have made good their threat to arrest automobile owners who failed to take out the city license last year. More than twenty arrests have been made during the past week, and it is said they will be continued until about 250 persons have been arrested. Local owners are indignant, but there seems to be nothing they can do, as the police court is assessing fines of $1 and costs, amounting to $11 in each instance where a 1907 license fee was not paid. No exceptions are being made, even if a 1908 fee has been paid, and a legal test of the law will immediately be made.

Last year, at license paying time, a test case was going through the courts to test the validity of the Indianapolis license ordinance. It was argued that it conflicted with the State registration law, but the courts held differently. The arrests last week were of business and professional men, principally in the downtown district. Other owners are to be arrested this week, but so far no one has suggested testing the attempt to collect a back license fee.

BAN PUT ON OFFENSIVE EXHAUSTS.

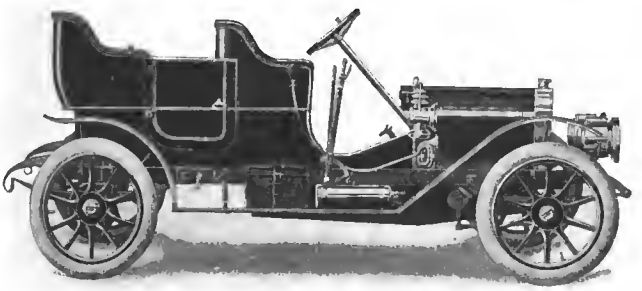
After August 1 New York drivers must keep a sharp eye on their exhausts, at least while on the driveways under the control of the Park Commissioners. Otherwise they may receive some unpleasant attentions from the park police. At a meeting of the Board last Friday the following ordinance was adopted:

"No person shall be permitted to run a motor vehicle in the parks or parkways of this city, under the jurisdiction of the Department of Parks, which emits from the exhaust or muffler thereof offensive quantities of smoke or gas or disagreeable odors," which means that the smoke and smell must go.

The worst offenders are said to have been the various taxicab companies. As the cabs are mostly handled by inexperienced drivers, some of the companies have standing orders that the exhausts must always be kept smoking, in order that the engines may be sure of ample lubrication. This practice will now have to be stopped. Similar ordinances against offensive exhausts have long been in force in Paris, as well as many other cities, and have had a salutary effect.

COMPLETE LINE OF KISSELKAR MODELS FOR 1909

FOR the coming season the Kisselkar will be represented by distinctive models, two of them designed for the buyers of light and handy cars, and a third, which is an entirely new addition to the Kisselkar line, consisting of a six-cylinder 60-horsepower touring model. Although the Kisselkar at $2,000 created no little sensation when it first made its appearance, the newcomers are considerably more in the way of eye-openers, as they are built on precisely the same lines as this year's $2,000 car, but are listed at $1,350 in the roadster type and $1,500 as a touring car. The Kisselkar has shown what it is made of by its excellent performances in competition with cars costing considerably more, so that there is little doubt that the announcement of a car of this quality at such a substantial reduction in price will give rise to an immediate and strong popular demand for this Western product. The new models will be smaller than



Attractive Ensemble of the New $1,500 Kisselkar.

the original Kisselkar, but in every other particular will be identical with their higher-priced prototype except for the proportionate reduction in horsepower.

Specifications Compare Well with High-priced Cars.

In view of the low prices at which the new Kisselkars of the light type are listed, the manner in which their specifications tally with those of cars selling at much higher figures makes them of unusual interest to the large number of buyers who have long been on the lookout for something of this kind. The motor is of the four-cylinder vertical type, the cylinders being cast in pairs, while their dimensions are 4 1-4 inches "square," that is, the bore and stroke are the same. The motor is rated at 25 to 30 horsepower and is designed to run at a moderate normal speed, thus making for a durable engine and one that is free from vibration. Either a Schebler or a Stromberg carbureter will be supplied, while a positively driven, force-feed mechanical oiler will take care of the lubrication, ignition being by means of the usual standard high-tension system, employing a set of accumulators and dry cells as the source of current. For transmitting the power, a cone clutch will be used in connection with a three-speed sliding gear-set on the selective plan, driving by propeller shaft to a floating type of rear axle. The differential is of the spur gear type and large driving bevels are used.

As evidence of the fact that details have not been slighted simply to bring the selling price down the rear axle is equipped with two Timken roller bearings on the pinion shaft, instead of one, thus insuring perfect alignment, while Spicer universal joints with dust-proof grease cups are employed on both the driving and propeller shafts. All control levers are drop-forgings, properly machined, keyed and bolted, instead of being taper pinned as is usual in low-priced construction. The axle ends from the center housing are keyed to tubing and then put under hydraulic pressure. In fact, everything is fastened in the most approved manner, only keys and bolts being employed, there being none of the usual taper pin fastenings such as were so commonly employed on cars of earlier vintages, and which were responsible for a very large part of the profanity that petty mechanical troubles gave rise to on many of the old timers.

Regular Models Will Also Be Continued.

The announcement of these new models is not to be regarded as being equivalent to the throwing over of the regular model of the Kisselkar which has shown up so well during the past season, as this is to be continued with scarcely any change. The general lines will be identically the same in numerous respects, but the car will represent a great deal more for the money than it has, and in view of the original figure this is saying a great deal. The body has been made six inches longer, while 36-inch wheels will be used instead of 34-inch, and in view of the initial expense for wheels and tires that the manufacturer has to bear in making a change of this nature, it may easily be put down as an improvement of considerable importance on any car selling at $2,000. An I-beam, drop-forged axle will be substituted for the lighter axle formerly employed, and the Atwater-Kent spark generator will be made a feature of the standard equipment where the ignition system is concerned, this taking the place of the four-unit dash coil employed on the previous Kisselkars. For the coming season these cars will continue to list at $2,000 with regular equipment, or $2,200 with special equipment, consisting of a Pantasote-lined top with bow separators, slip covers, Solar lamps, generator, gas tank and robe rail, it having become quite customary in the past few years for makers to list their cars with special equipment of this kind, in order that the purchaser may know exactly what the machine will cost him in complete running order, which means with those numerous accessories that make for comfort, included in the price. It seems quite probable that in time this will be a development that will take strong hold on the automobile trade, so that a top will come to be considered as much a part of a car that ought to be included in its selling price as it is in the case of a buggy.

New Six-cylinder Kisselkar for 1909.

In bringing out a heavy machine for next season's business the designers of the Kisselkar have not departed in any way from their regular standards, the new six-cylinder 60-horsepower representative of the line being merely an enlargement characterized by all those features of construction which have become familiar on its smaller predecessor. The cylinder dimensions are 4 3-4-inch bore by the same stroke, while the accessories are all the same as on the smaller engine. Provision is made for a high-tension magneto and this will be supplied as an extra. As a regular equipment, the Atwater-Kent spark generator will be fitted. This car is built with a drop-forged I-beam forward axle, is hung on three-quarter elliptic springs and has a 128-inch wheelbase. The wheels are 36-inch and the tires are 4-inch front and 4 1-2-inch rear. With a five-passenger tonneau and regular equipment this car lists at $2,750 in complete running order. As a seven-passenger car the price is $3,000, this including a Bosch high-tension magneto as a regular part of the equipment.

In thus adding new models at each end of the price line, so to speak, the builders of the Kisselkar, the Kissel Motor Car Company, of Hartford, Wis., have placed themselves in a position to take advantage of both extremes in the demand that bid fair to make themselves felt during the coming year than ever before in the history of the automobile industry in this country.

NEWS FROM TIRETOWN, OHIO, TELLS OF MUCH ACTIVITY

AKRON, O., July 25.—The Palmer-Hawkins Rubber Tire Company, of Akron, was incorporated a few days ago under the laws of Ohio, for the purpose of exploiting and marketing the sectional solid tire for heavy trucks patented by H. A. Palmer. It has not been decided by the company whether it will manufacture the tire itself, license other companies to make it, or contract for its manufacture and place it on the market. The company starts off with a nominal capitalization. Mr. Palmer believes that his tire has features in the sectional construction that are superior to all others.

The largest picnic out of Akron this year was run Saturday by the Diamond Rubber Company, when over 5,000 persons went to Meyers Lake, at Canton, on five trains. The Diamond band led the marchers to the depot in the morning. Charles Stamm was at the head of the publicity department for the excursion.

Akron is having her first chamber of commerce on a large scale, the movement having just been organized. Local rubber manufacturers are taking considerable interest in the organization for the advancement of the city, O. C. Barber, the match king and a stockholder in the Diamond Match Company, being present. The rubber manufacturers on the board of directors are H. B. Raymond, of the Goodrich Company, and A. H. Noah, treasurer of the Diamond Rubber Company.

Akron figured very largely in the Glidden tour, that closed this week, in more than one way. In addition to A. Auble driving one of the perfect score cars, Oldsmobile, in the Chicago Motor Club team, Akron tires were conspicuous, and a friendly rivalry existed between the manufacturers. The Goodrich and Diamond companies have both issued statements covering the participation of their makes of tires in what was really a great endurance contest. The Goodrich company makes this claim:

"Twenty-three of the 44 Glidden and Hower contestants were equipped with Goodrich tires. Of the 17 clean score cars, 9 were equipped with Goodrich tires, and of the 5 clean score cars in the Hower contest all had the Goodrich make. All of the winning Pierce Great Arrow team's cars had the same make."

The Diamond company makes its claim on superiority in cost of equipment in the following statement:

"Making actual tire cost the basis, as usual, the winning of the Glidden tour, so far as tire equipment is concerned, is credited to the Diamond make. The reports compiled by observers and given out by the Diamond Rubber Company show an average tire cost per car of $46.91 for all cars in the tour, both contestants and non-contestants. The average cost for Diamond tires alone was $16.88, considerably better than the average for the whole tour. The average cost per car for tires excluding Diamond equipment was $64.94. The basis of cost is taken with size 34 x 4, representing the general average of tire sizes used. All items, even punctures, etc., capable of ready repair, are taken into the account, but the big feature of the tire cost was the blowing out of casings and tubes. Of sixty-one blown-out tires all told, the number of Diamond tires so damaged was but five, and this with twenty-one contesting and non-contesting cars using the Diamond make. Of the twenty-two contesting cars with perfect scores at the end of the tour, nine were equipped with Diamond tires; two cars changed to Diamond en-route.

Announcement is made that the Firestone Tire & Rubber Company is preparing to enlarge its present capacity by at least one-third. Part of the improvement is already under way. A part of the present plant will also be rebuilt. The B. F. Goodrich and Diamond Rubber Companies are also preparing to make extensive additions.

HENRY FORD'S LITTLE RUNABOUT JOKE.

DETROIT, July 26.—Deep gloom has for some time enshrouded a considerable number of Detroit's colony of space eliminators whose high-priced and high-powered machines have been compelled to take dust from a diminutive car that heretofore was never regarded as a competitor in the matter of speed. Harsh things have been said regarding the various cars by their respective owners, and maledictions heaped upon the head of the man who in every instance succeeded in cleaning up by a margin that left no room for doubt. Incidentally it has been disclosed that the man who said Henry Ford was devoid of a sense of humor little knew who he was talking about.

Drivers of touring cars have for some time been mystified and chagrined by the ease with which Henry Ford, driving a little runabout about the city or country, succeeded in leaving them behind, despite their best efforts. Much speculation was indulged in, and great grew the fame of the little buzzabout capable of making all others look as though running backward.

Now the secret has been disclosed to a few, although it will be news to the vanquished. Some time ago Mr. Ford had constructed a six-cylinder engine which he mounted on a stock runabout chassis, to all outward appearances identical with the other runabouts turned out by the Ford Motor Company. Trials showed it to be possessed of practically unlimited speed and power. Then Henry Ford's humor asserted itself. Whenever a competitor was met on the road he would be passed as though standing still. Men prominent in the financial world and actively identified with automobile plants here have fallen victims to the speedy little runabout without being able to explain the trouble.

The secret was too good to keep, however, and the story leaked. Now that it is out numerous motorists will be inclined to retract some of the unkind things said about their machines and join Mr. Ford in the laugh at their expense.

RAPID MAKES BIG ADDITION TO PLANT.

PONTIAC, MICH., July 27.—Some idea of the growth of the demand for the Rapid commercial vehicles may be gained from the fact that the makers, the Rapid Motor Vehicle Company, are now at work on the fifth addition to their plant in three years. A contract for the erection of a new building to measure 60 by 300 feet, and two stories in height, has been let and the work of excavation already commenced. It will be constructed entirely of concrete and steel according to the Kahn system, even the roof and stairways being of this material, so that the building will be absolutely fireproof. The supporting walls will be five inches thick, but most of the outer walls of the building will be of glass. The present main building of the plant measures 60 by 300 feet, with an L, 60 by 200 feet, so that the new structure will practically double the capacity of the works. Other buildings comprising the plant are the body shop, 50 by 120 feet, the power plant, testing house and oil house. At present 200 men are employed and 10 cars are being turned out a week. Rapid cars are finding their way into every country of the world, no less than 10 per cent. of the entire output having been exported.

NEW PARTS CONCERN IN CONNECTICUT.

HARTFORD, CONN., July 25.—The Bristol Engineering Company is the title of a new company that has just been incorporated to manufacture automobile parts, and later to build taxicabs. The plant will be located in Bristol, which is a suburb of Hartford. The organizers are the Hon. Albert P. Rockwell, president of the New Departure Company, De Witt Page, secretary of the same concern, and F. E. Moskovics, of Kingston, N. Y. Mr. Rockwell is president of the new company, Mr. Page, vice-president, and Mr. Moskovics, secretary and treasurer. The capitalization has not been decided upon.

Installing Giant Gasoline Tank at Maxwell Factory.

The new gasoline storage tank shown in the photograph has a capacity of 10,000 gallons and was recently placed in the grounds of the Tarrytown, N. Y., factory of the Maxwell-Briscoe Motor Company. The picture shows the tank being hauled from the railroad station to the factory by a 24-30-horsepower Maxwell, which, with the aid of a block and tackle, moved the big cylinder at the rate of four miles per hour.

POPE COMPANY MAY BE REORGANIZED.

HARTFORD, CONN., July 25.—After hearing the arguments of both sides, Judge H. J. Curtis, sitting in the Superior Court here, signed an order authorizing the receivers of the Pope Manufacturing Company to transfer $300,000 of the concern's assets to New Jersey, for the purpose of paying another dividend of 25 per cent. to the creditors, as recently ordered by Vice-chancellor Howell, of Newark. The form drawn up by the receivers did not meet with the approval of the counsel to the Creditors' Protective committee, on the ground that it did not conform to the petition. In order to pay the dividend in question, $380,000 was necessary, and the order read "to transfer such sums as may be necessary from the sum of $628,000, now in the hands of the Connecticut receivers. Percy S. Bryant, of counsel to the creditors, quoted numerous figures, stating that the company had $1,338,000 in various jurisdictions, beside $39,000 outstanding in drafts and $136,000 as the proceeds from the sale of the Columbia steel plant, and stated that the creditors wanted an order to pay a 25-per cent. dividend in cash.

Another bone of contention was the question of setting aside $65,000 as a 25-per cent. dividend on the Unzicker claim, should this be allowed, but an order was entered striking this claim from the records in Connecticut. The attorneys for the different interests finally decided on the form of the order authorizing the receivers to transfer the necessary assets for the general 25-per cent. dividend and it was signed by the court. Judge Curtis also granted the order of the receivers, authorizing the receivers to carry on the business for another period of four months, and the latter made it plain that a reorganization would undoubtedly take place before the expiration of the time allotted.

HARTFORD DEALERS HAVE A GOOD IDEA.

HARTFORD, CONN., July 27.—Rather unique is the scheme of the Hartford Automobile Dealers' Association. During the week of the State fair at historic Charter Oak Park, the association will conduct a mammoth tent show of automobiles, accessories, and the like. The floor space will be about 15,000 feet and will be covered with tan bark. Now, then, inasmuch as a State fair is always a drawing card, it is reasonable to assume that those who are out to see all there is will visit the automobile exhibition. Many of the dealers in the association will have their 1909 models to show, and the exhibition will be a comprehensive one; at least the show committee will endeavor to make it such. The farmers are coming more and more to realize the true worth of the motor car, and the proposed show held in connection with the fair should prove a useful object lesson. Needless to say business will be done, for crops promise to be good and confidence being well restored orders are in prospect.

Next October there will occur the formal opening of the two million dollar Connecticut river stone bridge at Hartford. It is proposed to make the motor car one of the chief features of the celebration. Agitation favors the holding of the local club hill-climb during the celebration, which will probably last a couple of days. The new structure is the gateway of the east and is one of the finest pieces of stone masonry in the world.

NEWS FROM THE FRANKLIN HOME.

SYRACUSE, N. Y., July 27.—At the Country Club last Wednesday evening, H. H. Franklin, president of the H. H. Franklin Manufacturing Company, entertained the company's branch managers and traveling salesmen. They are in Syracuse from their various territories to attend the annual conference, which lasts a week. A most enjoyable evening was spent, and the host was toasted in true "drummer" style. Those present were H. H. Franklin, F. R. Bump, W. S. Jewell, A. B. Henley, J. F. McLean, J. E. Doane, L. E. Hoffman, George Ostendorf, George Messer, W. J. Reynolds, F. H. Sanders, R. La Porte and A. B. Caldwell.

Friday the managers and salesmen were the guests of the Crucible Steel Company and a tour of inspection was made through the big plant. The Franklin company uses large quantities of the high-grade steel made by this concern.

The H. H. Franklin Manufacturing Company has announced that the usual annual picnic for employees will be held at Long Branch, near this city, on August 15. The program will include numerous athletic events, and a baseball game will be one of the features. This company's shops, by the way, muster one of the strongest amateur nines in central New York. For three or four years it has been maintained, meeting the strongest shop nines of this section, and last year it won the championship trophy of the City Amateur League.

PFANSTIEHL LABORATORY HAS NEW PLANT.

CHICAGO, July 27.—The Pfanstiehl Electrical Laboratory is now occupying its new building in North Chicago. The new factory is a four-story brick structure with side track accommodations, and is supplemented by a specially constructed testing and experimental laboratory where the concern will continue its policy of advancement in gas engine ignition. Every necessary detail for the manufacture of x-ray and spark coils has been provided, and customers will be given the advantage of the special experimenting and research which these added features will facilitate. The change of location was made necessary by the increase in demand for the Pfanstiehl coil, which started several months ago, and which, the makers state, shows no sign of abating, but, on the contrary, is steadily increasing.

Laboratory at North Chicago Where Pfanstiehl Coils Are Made.

AUTO NEWS MADE IN GERMANY.

BERLIN, July 23.—The joint military drive of the German and Austrian Motor Volunteer Corps on July 27, 28 and 29 has attracted 44 entries, 25 of which are German. The start takes place at Vienna with the finish at Berlin. Cups have been given by the German Emperor, the Austrian Emperor, Prince Henry and the Archduke Frederick, as the character of the tour is a strictly military one, and is intended to show the car in war.

Lautenschlager, who has just gained such a splendid victory in the Grand Prix, made his début in first-class racing in this event. For years past he has been entrusted with the testing of the Mercedes cars and had also accompanied Salzer as his mechanician in many a big tussle, but this is the first time he personally has been seen at the wheel of a big racer.

A qualification test of 1,570 kilometers for the German Government subsidy for motor wagons and vans is being carried out by the Pioneer troops, a number of big German firms taking part in the contest, the result of which will be the basis of the subsidy scheme. A Buessing cart rigged up as a repair shop accompanies the tour, and will make all necessary repairs.

It is rumored that the Mercedes Company has sent in a protest against Erle's victory on a Benz in the Prince Henry tour, stating that the list of winners needs a careful examination.

September 20 has been fixed for the annual Semmering hill-climb of the Austrian Automobile Club, which at its inception was won three times running by the late American enthusiast, Mr. Dinsmore's Mercedes, driven by Werner, now head chauffeur to the German Emperor. In the racing division sub-classes have been arranged for non-restricted cars and cars of the 1908 Grand Prix type, while one category of the touring vehicles is open to Prince Henry type machines.

MASSACHUSETTS BODY TAKES UP "TRAPPING."

WORCESTER, MASS., July 27.—John P. Coghlin, chairman of the "Trap Committee" of the Massachusetts State Automobile Association, and president of the Worcester Automobile Club, issues the following bulletin:

The directors of the Massachusetts State Automobile Association have decided to take up the question of traps in Massachusetts. The directore feel that the traps fail to accomplish the purpose of eliminating reckleee driving. The directors are satiefied that a very large per cent. of its members drive carefully and in order to prevent careful drivers of automobilee from being annoyed by trape, a great many of which are operated for a pecuniary consideration, we have arranged with a clipping bureau to furnish us information as to location of traps.

We wieh you to co-operate with us and furnish us any information you may have with reference to traps. We ehall furnish a list of these to all clubs and instruct them to post them in their club rooms and in addition to this will furnieh each member of the Massachueetts State Automobile Association from time to time a list and location of trape in Massachusetts together with any comments which we deem neceesary.

Kindly co-operate with us in this matter, and address any information you have to John P. Coghlin, chairman trap committee, Massachusette Automobile Association, 234 Main street, Worcester.

A NEW TRANSCONTINENTAL RECORD.

Two college students, C. T. Crocker and M. C. Scott, with their chauffeur, Charles West, decided to go home to San Mateo, Cal., for their vacation in an automobile, instead of by train, as usual. So Crocker equipped his 1907 40-horsepower Fiat runabout, which had already seen some strenuous service, with an extra large tank, loaded up with ropes and tackle, provisions, guns and ammunition, and a camping outfit, and on June 25 the party left New York. Five days later they were in Chicago, and on July 3 they reached Cheyenne. There, however, they were detained two days while a local wheelwright was making a new wheel to replace one broken on the road. They finally arrived in San Mateo, July 14, having been twenty days on the trip, and establishing a new record for cars with a single crew, although the jaunt was undertaken principally for pleasure and not record-making.

AUTOS AT QUEBEC'S TERCENTENARY.

QUEBEC, July 27.—Automobiles played an important part in Quebec's recent tercentenary celebration, and it is estimated that over 200 came to this city from different parts of the Dominion and the United States. As the street car accommodations to the Plains of Abraham, where the principal exercises were held, were rather inadequate, everybody who could obtain a car was only too glad to make use of it. The roads were in good condition and made the run very pleasant. The Comet Motor Company, one of Canada's few automobile manufacturers, supplied five of its cars to the Prince of Wales and his suite for the occasion. An amusing interview is reported with A. A. Brager, of Baltimore, Md. "Your streets are worse," said Mr. Brager, "and your sewage system is very nearly as bad as in my own city, which is saying a great deal."

Reports from Charlottetown, P. E. I., state that an important step was taken in the fight against the new automobile bill when the counsel for the automobile interests moved for a rule to set aside the conviction made recently by Magistrate McDonald whereby the defendant, who illegally drove an automobile to test the act, was fined $500. The grounds on which certiorari were asked for were that a bill of this kind comes under the head of criminal law, which only the Parliament of the Dominion can enact, and that it is therefore beyond the power of the Provincial Legislature. A rule absolute was granted, and the argument was set down for hearing at the November term.

NO ARDENNES RACE FOR THIS YEAR.

PARIS, July 23.—Owing to the Ardennes race and the Florio Cup contest, both of which were announced under Grand Prix rules, being scheduled for closely approaching dates, it has been decided to abandon the former event this year in order to assure the success of the latter. The classic Ardennes race was originally announced for August 12; constructors thinking the interval between the Grand Prix and the Belgian race too short, a postponement was made to August 27. This, however, clashed with the Florio Cup contest announced months ago to be run on September 24, and a protest was made by the Italians. After a conference between the two parties, it has been decided to alternate the two races, the Italians holding a speed contest for the Florio Cup next September, and the Belgians running their Ardennes race in 1909. The following year it will again be the turn of Italy, and so on each year. By this arrangement there will be but two important speed tests in Europe each year under international rules, the Grand Prix and the Ardennes or Florio.

Owing to the unexpected result of the Dieppe race more importance than usual attaches to the Italian speed test this year. Though all who were present at Dieppe will not come to the starting line at Bologne, the number will certainly be greater than if the French cars had lived up to expectations on July 7.

A REPAIR SHOP IN THE WHITE MOUNTAINS.

BRETTON WOODS, N. H., July 28.—The White Mountains are growing in popularity each year as a touring district. Hundreds of cars speed over the roads daily. Most of the tourists make Bretton Woods their destination or use it as a central point for day runs through the outlying district. It was not enough to provide them with a commodious garage, which has been in existence for several years, so the management of the Mount Washington and Mount Pleasant hotels, John Anderson and J. D. Price, respectively, who are also well known hosts at Ormond during the Florida beach meets, this season have added to the plant a repair shop with complete machine tool facilities.

The shop is in two sections. In one there are facilities for owners and chauffeurs to do their own repairing free of charge. The other is a completely equipped shop. In the former work benches, vises, tackles and a pit are available. The latter is filled with standard up-to-date machines, and has competent mechanics always on hand. A charging outfit is also installed.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

From Rome, N. Y., comes the reoort that the Long-Turney Manufacturing Company, makers of the Long radiators, is about to erect a two-story addition, 50 by 100 feet, to its factory.

John Barker & Company, Ltd., Kensington, W., London, England, announce that their motor department is open to negotiate with American manufacturers of motor novelties and accessories on the basis of exclusive representation in the British Isles.

A new automobile factory is to be located at Moline, Ill. It is the Velie Motor Vehicle Company, and will manufacture gasoline, electric and steam cars. All the promoters are connected with the Velie Carriage Company. They are W. L. Velie, O. E. Mansur and S. Harper.

The 1909 $2,500 contest for Winton "Six" chauffeurs will probably be open to drivers of the 1908 "Six" as well as of the 1909 "Six." In this case no mileage reports will be accepted before October or November, in order that cars now in service may not have too great an advantage in time over new cars.

The Grove Garage Company, with W. B. Grove as vice-president and manager, has just opened for business in Bluffton, Ind. They will do an agency as well as a garage business and are desirous of receiving catalogues of cars, accessories and supplies, with a view to negotiating for their active representation in that part of Indiana.

Seattle, Wash., business men have formed a company to operate taxicabs in that city. S. A. Burch is president; Frank Hanford, vice-president; Charles Perry, secretary, and C. M. Hatcher and C. A. Stewart, managers of the concern, which has a capital stock of $150,000. Five cabs are to be in use within thirty days, and others have been ordered.

Another city to enjoy the advantages of the most modern method of transportation is Los Angeles, Cal., whose local taxicab company placed its first machine in operation recently. E. A. Anthony, manager of the Western Motor Car Company, is interested in the new enterprise, and headquarters for the present are in his garage. The cars in use are of the Thomas make.

Tennant Motor, Ltd., Chicago agents for the Peerless, at 1449 Michigan avenue, have just increased their capital stock from $7,500 to $60,000, according to certificates recently filed with the State Secretary of Illinois to that effect. This agency has had a wonderfully successful season with the 1908 cars and has already sold no less than 16 Peerless cars with Kimball limousine bodies for 1909 delivery.

The adaptability of the automobile to all continents is strikingly shown by the trip of an officer of the German army, Lieutenant Gratz, through German East Africa. The roads of this country are of the most primitive character, and great difficulties are met with, of whlch the tropical heat is not the least. Lieutenant Gratz reports that his Continental tires are giving the best of satisfaction, even under these adverse conditions.

Another startling reminder of the grade crossing menace was the experience of three prominent motorists on the Mills crossing in the town of Canton, Conn. The car was approaching the crossing and the oncoming passenger express was not noted. The driver of the car brought it to a quick stop, and as the train whizzed by it clipped the two headlights off as clean as a whistle, the fate of the party having been decided by possibly an inch.

That there is a demand for foreign automobile tires in this country seems to be the opinion of Pirelli & Company, Milan, Italy, who have recently established an American agency at 296 Broadway, New York. Sherburne P. Becker, formerly Mayor of Milwaukee, is one of their latest customers. It will be remembered that this was the tire used on the Itala car with which Prince Borghese won the Pekin-Paris race.

The Grout Automobile Company of Orange, Mass., states that G. H. Denton of Denver, Col., recently drove one of its cars 272 miles over the mountainous Colorado roads in one day, his running time being 13 hours. Sixteen gallons of gasoline were consumed. The car was a 1905 model, which had already been run about 20,000 miles, and carried four passengers. No repairs or adjustments of any kind were made.

Berlin, N. Y., is famous for its gladiolus, or rather the extensive fields of them that constitute a feature of "Meadowvale Farm," as it would be out of place to use the word in the singular in view of the fact that during the season, which extends from August 1 to September 10, there are from 15 to 30 acres of them to be seen in bloom at one time. Many automobile parties drive to Berlin from the Berkshire region just to get a glimpse of the great expanse of color.

The New York branch of The White Company will hereafter be known as the Eastern branch, and George W. Bennett will take the title of Eastern sales manager. The territory to be handled by the Eastern branch comprises New York State as far as Rochester, the eastern counties of Connecticut, part of Berkshire county, Mass., the entire States of New Jersey and Delaware, and the eastern half of Pennsylvania. The office of the White Company in Philadelphia becomes a sub-branch under the control of Mr. Bennett.

A decision against the complainant has just been handed down by the United States Court of Appeals in the case of the Boston Woven Hose and Rubber Company versus the Pennsylvania Rubber Company, referring to a patent claimed to cover the use of security bolts on automobile tires. Had their patent been upheld, the Boston company would have been able to collect royalties from anyone making or using such security bolts. This would have affected the whole tire industry.

According to C. W. Kelsey, the 24-h.p. Maxwell will undertake the New York-San Francisco endurance run even if none of the Glidden tourists accept the challenge. Mr. Kelsey has just returned to the factory from Chicago, where he went to make preparations for the contest. The route contemplated is as follows: New York, Buffalo, Erie, Cleveland, Toledo, South Bend, Chicago, Cedar Rapids (Ia.), Omaha, Cheyenne (Wyo.), Ogden (Utah), Elko (Nev.), Sacramento, San Francisco. The distance in round numbers is 4,200 miles.

On the evening of June 21, 1885, seven owners of Rambler bicycles met in the city of Buffalo, N. Y., to organize the Buffalo Rambler Bicycle Club. Just a few weeks ago these seven original members, with some two hundred fellow members, celebrated their twenty-third anniversary at a reunion and outing at Eagle Park, in that city. Although the club started in an unpretentious way, it was soon the largest in Buffalo, maintaining a large gymnasium with billiard and reading rooms, and many world-famous drivers carried its colors to victory. It is now the oldest bicycle club in the world. Of its two hundred odd members not a few own Rambler automobiles.

The Goodyear Tire and Rubber Company has taken a contract to furnish 25 of the New York Transportation Company's 50 taxicabs with its quick detachable tires. The remaining 25 were originally so equipped, and had given such good service that the company decided to use Goodyear tires on all its cabs. Goodyear tires will also be used on the 300 cabs of the New York Taxicab Company and the 50 cabs of the Terminal Taxicab Company of Washington. The Goodyear Company points out that the tubes and casings of these tires can be changed very quickly, and by the use of the new Goodyear air bottle, charged with pure air, can be inflated in less than a minute.

When Presidential candidate Taft visited President Roosevelt at Oyster Bay, July 23, he was met at the West Twenty-third street ferry in New York by one of the government White steamers, and under the protection of "Casey the Cop," was driven in a jiffy to the East Thirty-fourth street ferry, the traffic and speed regulations being for the moment suspended. Once in Long Island, the car proceeded in record-breaking style to the President's residence at Sagamore Hill, and a few hours later brought Mr. Taft back all the way to his hotel in New York. It will be remembered that on his last visit to Oyster Bay, three weeks ago, he came back as far as Long Island City in the automobile, and evidently the habit is growing upon him.

A unique test will be started by the Brush Runabout Company this week, when four Model B 7-horsepower Brush runabouts and one Brush delivery wagon will leave Detroit on tours radiating through all parts of the country. One will go through Cleveland, Buffalo and New York to Boston; others to Pittsburg, Philadelphia and Washington, to Cincinnati, St. Louis and Kansas City, to Indianapolis, Springfield, Ill., and Chicago, and to Chicago, Madison, Wis., and Minneapolis. The tours are designed to demonstrate the fuel economy, reliability and general efficiency of the cars through the country which they traverse—incidentally spreading the good roads gospel. A booklet will be published by the company at the end of the run, giving information about gasoline and oil consumption, repairs and adjustments, etc.

NEW AGENCIES ESTABLISHED.

W. C. Chambers and F. C. Winkel have opened a new auto supply station in Philadelphia, at 1320 Vine street. The new concern will be known as the Automobile Supply Company.

The Michelin Tire Company has opened a branch at 2001 Euclid avenue, Cleveland, O., under the management of R. B. Tracy.

with D. K. Dickinson, formerly of the Hartford Rubber Works, as assistant.

The Gyroscope Automobile Company bas just been incorporated to handle tbe output of Blomstrom Gyroscope cars. The incorporators are C. P. Fleming, Douglas Hamilton and A. L. Kull, the latter heing general manager. The company will shortly establish its salesrooms at 231 West Fifty-fourth street, New York City, where extensive alterations are now in progress. The new headquarters will have ample storage room and a large macbine shop.

PERSONAL TRADE MENTION.

C. A. Coey, for many ycars the Thomas Flyer representative in Chicago, has at last severed his connection with that firm, and will shortly locate on Automobile Row as agent for the De Luxe.

Followers of automobile trade doings will remember the work of Percy F. Megargel in the Oldsmobile New York-Portland race, and the double transcontinental trip of the Reo *Mountaineer*. He is now advertising manager for the National Sales Corporation, with offices at 296 Broadway, New York.

Charles M. Brown.

Recently appointed manager of the New York branch of the Winton Motor Carriage Company.

"Eddie" Richards, the well-known driver of Buffalo, has just left the E. R. Thomas Motor Company to accept the position of demonstrator for Mason B. Hatch, the Chalmers-Detroit agent in Buffalo. Mr. Richards drove perfect-score cars in the Glidden tours of 1906 and 1907 and bas the reputation of heing one of the best demonstrating salesmen in the business.

C. H. Tucker, the sales manager of the Acme Motor Car Company, has gone to Savannah, Ga., where he will remain two weeks. Mr. Tucker stated that his trip was necessitated by an accident to J. C. Finney, tbe Savannah agent, who was thrown from his car while speeding and is still confined to his hed. A number of cars bad been shipped to Savannah and Mr. Tucker went to look after them.

Mason B. Hatch, salesmanager of the E. R. Thomas Motor Company, of Buffalo, N. Y., has resigned to go into the retail field. He will handle the Chalmers-Detroit line exclusively in Buffalo and surrounding territory. Mr. Hatcb is the second salesmanager to join the ranks of the Chalmers-Detroit dealers. The unusual opportunity offered hy tbe Chamers-Detroit line is the explanation given by Mr. Hatch.

In the Columhus (O.) *Press-Post* the following recently appeared: "If persistence could he humanized and made tangihle, it could be presented in no clearer vision and suhstance than emhodied in the physical and mental make-up of C. D. Firestone, of the Firestone Tire and Ruhher Company, Akron, O., who of all men typifies the word in the fullest and highest sense. Every fiher in his being, mental and physical, means fight, determination, persistence. That has heen C. D. Firestone all his career. He nevur waits to see what position some other person is going to take. He takes his position first and then turns ahout to see who has joined him. If none, then he is yet sure he is right. Whatever his views and sentiments, he believes in them to the full and fights for them. Mr. Firestone is a man of enlarged business capacity, with physical grasp equal to his intellectual grasp."

TRADE PUBLICATIONS RECEIVED

Continental Caoutchouc Company.—This company is sending out to automobile users an interesting booklet describing the trip of J. M. Murdock from Los Angelee to the Atlantic Coast. Mr. Murdock, of course, ueed Continental tires. The circular aiso contains data of the carrying capacity of tires, hints for proionging their life, etc.

Thomes B. Jeffery, & Co., Kenosha, Wis.—One of the oidest and brigbtest of tbs many "house magazines" is that published in the intsrests of the Rambler. The current issue is entitled the "Maintenance Number," and is devoted largely to letters from Rambler owners detailing their expenses and mileage. In ons articie testimonials from owners in thirty-seven States have been gathered, some of whom have had their care four or five years. Many of them have truly remarkabie records. The magazine, as usual, is iiiustrated with many photograpbe of Rambler cars of different types, and contains a numbsr of quotations from well-known writers.

Bosch Magnsto Company, 160 Wsst Fifty-sixth street, Nsw York.—New publications concerning the products of this company have to do with the recently announced Bosch magnetic plug ignition with low-tension magneto (system Honoid), for three, four and six-cylinder motors. Full details of the new type of plug, wbich makes possible the mechanical simplicity of the high-tension with tbe freedom from electrical troubies and wiring of the iow-tension system, are given as well as iiiustratione of its parts and assembly. Aiso tbe synchronized low-tension magneto designed to act as the source of current suppiy and the method of wiring are shown together with other necessary information concerning the new system.

Cadiiiac Motor Car Company, Detroit, Mich.—"How to Drive a Model G Cadiiiac" is one of the beet-written instruction books that have come to hand in a long while. It certainly contains a great deal of information that the average owner of a car is desiroue of having and convincee the man who thinks that "ae long as the car runs everything is aii right," of the extent of his error. There are many pointers given which, if heeded by those who read them, will save many a doiiar that must otberwise bé paid out for experience. In fact, the contents of the booklet are much more comprehensive than the title would indicate, as there is a great deal of value concerning the maintenance of the car as well.

Hyatt Roiier Bearing Compsny, Newark, N. J.—"Technical Data and Dimsneions of the Hyatt Flexibie Roiier Bearing as Applied to the Motor Car" outiines the raison d'être of a well-executed booklet prepared by this firm to ehow the application of its product to the automobiie in such situations as the change-speed gear-set, shaft drive, rear axie bearings, bevel gear drive, countershaft on a chain-driven car and similar rôies. Nó iess than 250 sizes of Hyatt roiier bearings have been standardized for all conditions of speed and load and detailed information concsrning these, as well as their capacity and fitness for various applications on the automobiie, is given. It ie entitled Bulietin 31, and will be sent upon request.

Page-Storms Drop Forgs Company.—A folder from the Pags-Storms Drop Forge Company announces their removal from Springfield and Chicopee Falls to their new plant at Chicopee, Mass. By combining the two shops the managsment is now in a position to give ths details of the business a close personal supervision, which should result most satisfactoriiy and insure a first-class product. The company will continus to manufacture the same lines as before, including drop forgings, drop-forged wrenches, eyebolts, thumbecrews and nuts, etc. Thsir long experiencs has enabied them to adopt the most modern construction and equipment for the new plant, thereby insuring their customers the best of service.

Firestons Tire and Rubber Company, Akron, O.—Ths cover of this company's latest booklet seems to represent the Flatiron building, towering majestically above a crowd of rushing firs-engines, delivery wagons and auto trucks, all of course equipped with Firestone tires. In the foreword the manufacturers state that they have aimed to omit all argument of their own; instead, they simply present photos of the different types of vehicles to which they fit their tires, with testimonials from the respective makers. The number of examples iiiuetrated weii shows the remarkabie growth in this industry; and indeed, ae the Fireetone company say, the booklet is not only an advertisement for their tiree but aiso a practicaiiy compiete directory of the manufacturers of auto-trucks. They are represented there in aii styies and eizes, both eiectric and gasoline, from the light parcel-delivery wagon to ths four or five-ton truck.

Packard Motor Car Company, Dstroit, Mich.—Under the titie of "Packard Motor Cars, 1909," this company is eending out one of the firet catalogues of the nsw season's cars. The Packard is such a well-known product that iiiustration rather than description ie rciied upon to convey to the reader the character of the Packard representative for the coming year. Interspersed among the attractive pictures of the various types of Packard bodies snd equipment are some interesting views of ths plant where the Packarde are made. Then there is a mere mention, beside the iiiustration of course, of two new Packard comers. The Packard truck, which is the result of five years' development and the Packard "Eighteen" eiimousine, a brand new comer, about which tbe makers have kept mum up to the present. Special booklets devoted to thess models will be forwarded upon request. The booklet closee with a description of ths technical features of the Packard "Thirty" and a Packard "Thirty" price-list.

Premisr Motor Mfg. Co., Indienapoiis, Ind.—"Character" is the titie of a booklet dsvoted to the exploits of the Quality Car. After explaining their beiief that the cars which make good in public contests will hs found to give equaiiy good service in the hands of their ueere, the manufacturers give an interesting acconnt of the 1907 Glidden Tour, in whicn the Premier entrant and ths Premier piiot car both distinguished themselves. The story is iiiustrated with many good viewe of the contestante at different parts of the course. There follow a number of paragraphs devoted to the three Reliabiiity Runs of the Chicago Motor Club, in all of which the Premier made good showings, and to some fast runs made by Premier owners in different parts of the country. A eecond and smaiier booklet contains the experiences of the Premier "Pathfinder" in iaying out the course for the 1908 Glidden Tour. For twenty-four consecutive days of mud-plugging and mountain climbing this car ran without a falter and without a single mechanical replacement. Like the first, this is illustrated with intereeting photographs taken along the route, including the Delaware Water Gap, Longfeilow's home, hunting cabins in Maine, and other attractive places.

Stewart & Clark Manufacturing Company, Chicago.—"Satisfaction" ie the heading of a large and attractively printed poster that this firm of speedometer manufacturere is now sending out, and satisfaction ie aiso the ksynote of its contente, ae in addition to the dscription and iiiustration of the parts and workings of the Stewart and American instruments, a second sheet pictures the cars of a number of prominent Chicagoans, giving their names and showing how the speedomstere manufactured by this concern are mounted on them. Across the top of this sheet is the statement that "500 cars equipped with Stewart speedometers pass ths corner of Michigan avenue and Jackson boulevard in less than 8 hours," and ths rest of the circuiar subetantiates it by giving ths names of the owners of the 500 cars, as weii as the make of car. As this is one of the busiest etreet corners of the Windy City, the man stationed there for the job found it difficult to get all of the license numbers, and not a few escaped him. The iiiustrations of the circuiar are made from photographs of cars on which Stewart epeedometers are used, all the pictures being snapped in one day as the cars were found standing at the curb in different parts of the city.

INFORMATION FOR AUTO USERS

G-L Economizer.—This is an air-control device which automatically governs the air in the float chamber of any float-feed carbureter, and its action when attached is dependent and is solely governed by the vacuum created in the suction tube of the engine when it is running, automatically stopping and starting with the engine. There are no valves, springs or other parts to wear, and when once attached, it becomes a permanent fixture. It is connected to the inlet manifold, in which a vacuum is created by the motor, and this causes a decrease in the atmospheric pressure in the float chamber of the carbureter, this partial vacuum in the float chamber fluctuating according to the degree of vacuum in the manifold, thus automatically governing the quantity of gasoline issuing at the jet and thereby insuring a uniform mixture regardless of the load or speed. This result can only be obtained where the gasoline issuing from the nozzle is held at a constant level and it insures an increase in power as well as a great increase in the flexibility of the engine, at the same time eliminating difficulties arising from carbon deposits. Maximum power is also obtained and the makers claim a 50 per cent. saving in the consumption, due to the uniformity of the fuel charges. The instrument is neat and attractive and is furnished complete with all fittings for installing. It is patented in this country and abroad and is being marketed here by the G-L Economizer Company, *Times* Building, New York.

G-L FUEL ECONOMIZER.

Bowers Junior Carbureter.—This is a smaller edition of the Bowers carbureter, and, while brought out to sell at a low price, is nevertheless of high-grade make, perfect in workmanship and finish, and, according to the manufacturers, the F. E. Bowers Company, Inc., New Haven, Conn., with the exception of the regular Bowers' carbureter, it will give the greatest economy and flexibility possible. It is designed on the Venturi tube principle, having a vertical tube of this type, thus giving a straight draught through the carbureter. Supplementary air is admitted through an original diaphragm placed over the Venturi tube, this air being controlled by reed or flapper valves of different size and gauge, which, taken in conjunction with the Venturi principle, gives a perfectly proportioned mixture for all speeds. The Bowers junior is small, light and compact in design. The throttle part can be set at any angle and the carbureter can be instantly taken apart without any danger of getting out of adjustment, as the only adjustment necessary is at the spray nozzle for the gasoline. The float chamber is concentric with the nozzle, thus making it impossible for the angle at which the car is running to affect the feed. The nozzle is of the new Bowers atomizer type and the carbureter is completely protected at the air entrance and cannot drip or leak.

BOWERS JUNIOR CARBURETER COMPLETE.

"Watch Dog" Auto Protector.—The Automobile Protection Company, 322 Hudson street, New York City, have perfected a neat and convenient little instrument to keep track of the movements of a car and have very aptly named it the "Watch Dog." It works on the principle of the pedometer and is designed to warn the owner when his car has been taken out of the garage by his driver without permission, but, unlike many of the instruments devised for this purpose, it is extremely small and compact, besides being self-contained. The fact that the illustration shows practically the actual size will give some idea of how very small it really is. There are no driving gears, wires or other attachments, it only being necessary to fasten the "Watch Dog" to the dash or any other part of the car. As it depends for its action upon vibration, and every cars differs somewhat in the amount set up by its running, it is necessary to note the reading of the instrument after having run the car for a certain period. Once this is known, the owner has an accurate check upon his car, as a glance at the instrument will show that it has bene taken out and its reading will indicate how long it was out without his permission. To prevent tampering, the action is protected by a hardened steel ring placed around it and the instrument is permanently sealed in place on the car.

LIFE SIZE CUT OF THE "WATCH DOG."

Siro Carbureter.—In bringing out this carbureter, the makers, the Siro Carbureter Manufacturing Company, 27-35 Taylor street, Springfield, Mass., have made a radical departure from current practice in that all air-controlled valves and diaphragms have been done away with. The entire working of the carbureter is mechanical, so that, once adjusted, it stays that way and there is no need for constant tinkering. The auxiliary air and gasoline valves are so arranged that they open or close a certain distance corresponding to the position of the throttle, so that every adjustment on the carbureter is controlled by a single lever. The peculiar construction of the mixing chamber is said to give a uniform mixture at any position of the throttle, regardless of the speed of the motor, the makers claiming that it is possible to adjust it when on the motor so that the car can be driven from two to three miles an hour up to its maximum speed simply on the throttle. The best materials are used throughout, all fixed joints being pinned and riveted, thus doing away with the possibility of anything slipping. The Siro carbureter is now being manufactured in six sizes, namely, 1, 1 1-4, and 1 1-2 inch horizontal type, and the same sizes in the vertical type. It is instantly adaptable to a large number of well-known cars.

VERTICAL TYPE OF SIRO CARBURETER.

Prest-O-Lite Motorcycle Tank.—A Prest-O-Lite gas tank for motorcycles has made its appearance on the market. Its aim with the motorcycle, as with the automobile, is to furnish "gas on tap," which can be turned on and off like a gas jet. The motorcycle Prest-O-Lite tank stores 10 cubic feet of gas. With the 1-4-foot size of burner, usually employed on motor cycles, this new Prest-O-Lite tank gives continuous light for 40 hours. The size of the tank, 4 inches by 12 inches, makes it small enough to be carried easily. It is constructed of drawn steel of high tensile strength, and is finished in triple nickel plate. The retail price will be $10, and recharged tanks will be obtainable at any of the Prest-O-Lite Company's 2,200 exchange agencies, at about 60 cents.

NEW PREST-O-LITE TANK FOR MOTORCYCLES.

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THE AUTOMOBILE

LONG ISLAND'S MOTOR PARKWAY GROWS APACE

It is Nothing Short of Marvelous to Watch the Steady Progress in Building the Famous Motorway.

NEARLY 11 miles of the Long Island Motor Parkway will be available for the Vanderbilt Cup race of October 24, next, preceded by an American elimination trial scheduled for October 10. These 11 miles of perfect motor highway, fenced on both sides by heavy wire, will be supplemented by additional adjoining roads until a course of approximately 25 miles will have been secured for the great American derby of automobiling. Formal application for the use of the supplementary roads was favorably acted upon Monday last by the Board of Supervisors of Nassau county.

That the Nassauvians would welcome the running of the race once more over their highways was never for a moment in doubt. Their readiness to grant permission to use 14 miles of the county's magnificent highways in connection with the 11 miles of the Long Island Motor Parkway assured of completion in time for practice for the trials and the race was confirmed by the outcome of the public hearing at Mineola on Monday morning.

Practically no opposition whatever developed, and the Nassau County Supervisors gave their permission. The sole opposition developed centered in one objector, Charles G. Peters, of Westbury, who declared that the damage done by the racers of 1906 to the roads in front of his Meadow Brook estate had not been repaired and further complained of the violation of speed limits during the preliminary practice. The protests of Mr. Peters, however, were more than offset by the advocacy of the race by Charles Christman, of the Central Park Citizens Association, and the unanimous approval of the county land owners present at the hearing.

The formal permission was granted contingent upon the commission giving the county a bond for $25,000, not to be released until all the roads used had been restored to their normal state of repair, which was promptly acceded to by the petitioners as a reasonable demand on the part of the authorities.

Most important, however, of the details of the promotion of the race was the announcement by A. R. Pardington, who made the application on behalf of the Vanderhilt Cup Commission as a member thereof, that 1,200 uniformed and armed men would be furnished to guard the course, in addition to the deputies furnished by the sheriff of Nassau county.

The policy and promise of the A.A.A. that it would not promote or sanction a race not properly policed was thus made good. This policy, be it remarked, has been endorsed at the big road races and hill-

That Stage of the Work Just Preceding the Top Dressing and the Steam Roller which Finishes the Surface.

climbs of the past season to the entire protection of the public. Mr. Pardington further offered to station flagmen at all crossings during practice and racing hours, and to make such other provisions as the safety of the contestants and citizens might demand. Incidentally, the supervisors decided to purchase two motorcycles fitted with speedometers to assist in the arrest and conviction of violators of speed limits on Nassau county roads.

Nor when considering the question of protection must it be forgotten that the 11 miles of the motor parkway, where the majority of the spectators will naturally congregate, will be guarded by a high fence on either side absolutely cutting off the public from access to the course.

More detailed information of the course, built and secured for the running of the race than was outlined in the formal petition to the Nassau county supervisors assures the fastest circuit ever prepared for an automobile road race. Over it an average speed of 70 miles an hour is possible. In fact, the speed limitations of the cars themselves would seem alone likely to measure the rate of going. It looks, in fact, this time to be a new world's long distance record for the mere trying, and a temptation that makers and owners of fast cars on both sides of the water will find hard to resist when they realize what is available.

The route presents few hills of any considerable grade. More than one-half of the circuit is down grade. The balance is practically dead level, and includes 11 miles of specially laid cement highway. The parkway section is dished and banked upon all turns with easy grades approaching public highway and railway crossings. The splendid county and State roads embraced in the course will admit of speed well nigh as great as on the parkway.

A mammoth steel stand ten times the size of former ones is to be erected by the parkway corporation on the south side of the cement stretch four miles from its beginning. It will afford its occupants not only a bird's eye view for the entire 11 miles, but will enable them to see the racers at their highest speed on the easy "S" turns and as they negotiate grades at crossways.

In his enthusiasm A. R. Pardington thinks the parkway worthy of being dubbed "The Plateaux Racing Drome," and is sure the spectator will yearn for a gentle balloon flight of a few hundred feet that would give him a view of the entire race, so free is the course from hills of pronounced grade.

Beginning at the Jericho turnpike and the Old Westbury road, the racers will speed over Hempstead Plains with not a vestige of shrubbery or any woods to cut off the view. The parkway also runs through the same kind of open country, affording an unbroken vision. Leaving the parkway and entering the public road at Bethpage, the racers will encounter Manneto Hill, hardly of sufficient grade to be worthy of a name. Then will come the only stretch of road at all dangerous, and this by reason of the foliage of the Round Swamp and Plainview roads being thick and frequent turns admitting of but a short range of vision. There is ample shade from overhanging trees along the Jericho turnpike, but the road is very broad, permitting a view ahead of ample extent to insure safety in driving.

Along the parkway stretch there are two or three cement bridges, and one span to carry the road over intersecting roadways and low places. The center of the parkway, it may be interesting to note, is being built first to insure early completion and a firm bed. Later, however, the road will be widened six feet on either side.

To describe more particularly the circuit chosen, the boundary of the course is the well-known Jericho turnpike, beginning at the old Westbury road, about three miles east of Krug's corner and running 10 miles east to the intersection of the Woodbury and Hicksville macadam road.

The Parkway Winds Through Some of the Prettiest Farming Country on Long Island, Noted for Its Quiet Beauty.

Showing the Wooden Molds, Mixing Machines for Cement and Stone, and Wire Netting Which Goes Between.

The western boundary of the course is composed of a portion of the Old Westbury road running south from the Jericho turnpike to the Old Country road, and along the Old Country road about an eighth of a mile to Whaleneck avenue, thence south to the beginning of the Motor Parkway.

The southern boundary is made up entirely of the new cement parkway beginning at Whaleneck avenue, and paralleling an abandoned branch of the Long Island Railroad known as the Hempstead branch, for a distance of nearly 11 miles to a small settlement called Bethpage.

The eastern boundary of the course begins at the termination of the cement parkway at Bethpage and runs north along Round Swamp road to its intersection with the Plainview road and along that thoroughfare to its intersection with the Woodbury and Hicksville macadam road, along which it continues to the Jericho turnpike, where there is a sharp left turn known as the "Flatiron." From this turn the course practically coasts westward on Jericho turnpike for 10 miles back to the Old Westbury road and thence south to the beginning of the parkway.

There are eight sharp turns on the State and county road portions of the course, but the parkway turns are all beautifully rounded and banked. The surface of the cement is as smooth as a city concreted street, and the possibilities for high speed are quite enough to satisfy the ambition of the most daring racing drivers in the world.

General Manager Pardington, of the Parkway corporation, who has charge of its building, says that it will be completed in ample time for the American cars to practice for the elimination trials set for October 10 for a few days. The work is distributed among several contractors, each of whom has but a short section of road to complete. All of the crushed stone and cement necessary in the construction is upon the ground, together with the steel netting, which forms the foundation for the cement roadbed. The wire fencing which is to run along both edges has been contracted for. This fencing is about five feet and composed of 10 parallel wires set close together and held in position by vertical wires about 12 inches apart.

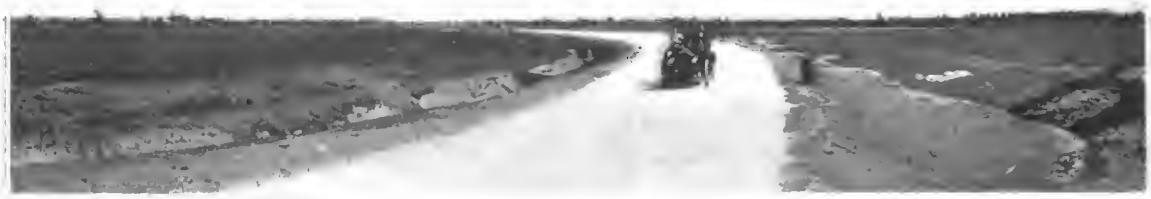
The toll bridges will be completed in time for the race. One of them is located near the Meadow Brook Hunt clubhouse, a fashionable rendezvous for Long Island's elite colony.

The course for the 1908 race is much more isolated than those previously used for Vanderbilt Cup races, in that no part of it passes through a town or village where crowds would naturally congregate.

Frederick Skene, State Engineer and Surveyor of New York State, this week drove over the State roads which are to be used in connection with the cup course, and made some suggestions to Mr. Pardington as to the oiling of the State roads. Mr. Pardington agreed to carry out the State Engineer's suggestions, and at the same time pointed out to Mr. Skene one or two bad places, which Mr. Skene said he would have repaired at once, in order that oiling may be done in September.

Joe Tracy, the Vanderbilt cup driver who made the fastest lap in the 1906 races, has consented, together with two other well-known racing drivers, to make a speed test on the cement road surface of the Parkway within a few days He will drive the Locomobile which he used in the 1906 Vanderbilt. The purpose of the test is to satisfy the Parkway engineers that their calculations on banking and dishing at curves, and on the approaches to viaducts over intersecting highways, are correct, not only in theory, but in actual practice. From the viewpoint of the autoist the test will be of considerable interest, as not only showing what speed will be possible on the cement straightaway, but also the effect of the cement on the tires.

When the Steam Roller Gets to Work It Soon Begins to Make the Parkway Such in Reality.



Completed Section of Parkway Showing Garford Car Making One of the Well-constructed Turns.

PROPOSED SPEEDWAY IN NORTHWEST.

TACOMA, WASH., Aug. 1.—According to present indications, an automobile speedway may shortly be constructed between this city and Seattle. A civil engineer employed by an Eastern automobile manufacturer has been looking over the proposed route and has recommended the investment of $1,000,000 in the enterprise. The road would be built of shells, forming a surface which requires few repairs, and would be divided by a curb in the middle into two pathways for autos going in opposite directions. A small toll would be charged, and the constructing company would maintain garages at each end, where machines could be rented for the trip, which could be made in half an hour.

OKLAHOMA STATE BODY JOINS THE A. A. A.

Oklahoma automobilists have formed a State association of about 200 members, and at a meeting of the executive committee of the A. A. A., held Tuesday last at No. 437 Fifth avenue, New York City, the Oklahoma Automobile Association was admitted to membership as the twenty-fifth State body affiliated with the national organization.

Secretary F. H. Elliott's report showed that 24 new automobile clubs have been added to six of the State bodies during the past month. A long list of individual members, scattered through many States, was also placed on the membership roll.

President William H. Hotchkiss presided at the session, which disposed of a mass of routine matters, and made other plans for the association, which will be announced subsequently and prove of undoubted value to the association. One contemplated move, when it is made known, say the A. A. A. officials, will be received with particular favor and commendation throughout the entire country.

JERSEY CITY TO NEWARK HIGHWAY.

The Boards of Freeholders of Jersey City and Newark have authorized the construction of a broad highway connecting the two cities across the New Jersey "meadows," to replace the old Plank Road. This barren tract, it is believed, will soon be covered with manufacturing plants, and the new road will then become one of the greatest industrial centers in the country. The roadway will be of concrete, 100 feet wide, and will have a new bridge over the Passaic River. Engineers are now working on the plans, and it is hoped that actual construction work will be begun this winter. The estimated cost is close to $1,000,000, of which Essex will pay five-eighth and Hudson three-eighths.

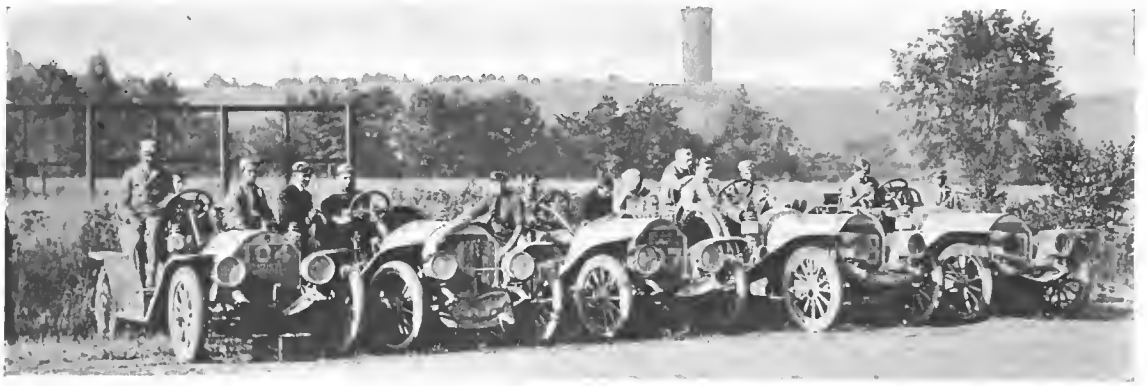
ST. PAUL CLUB IMPROVES ROADS.

ST. PAUL, MINN., July 31.—The Automobile Club of St. Paul has decided to spend the $6,000 which it cleared at the race meet July 15 on improving the roads of this vicinity. Two wagons, manned each by a crew of laborers and a foreman, will be put in commission for the rest of the summer and travel over all the macadam roads around the city, repairing all inequalities.

MORE ARRIVALS BY AUTO THAN TRAIN.

BRETTON WOODS, N. H., Aug. 2.—The two big hotels at Bretton Woods, the Mount Washington and the Mount Pleasant, are receiving more guests who come by automobile than by train. Since July 15 there have been 555 arrivals by auto and only 373 by train. In the garage 123 cars have already been accommodated, many from distant points. With the building of new roads in the White Mountains automobile travel is becoming the preferred method of transportation in reaching this region.

Once More the Jericho Turnpike Is to Be Included in the Famous Vanderbilt Cup Course.



Line-up of the Five Tied Hower Trophy Candidates: Premier, Two Stoddard-Daytons and Two Pierce Great-Arrows.

RUNABOUT TIE RUN-OFF MAKES A PIERCE WINNER

BEDFORD SPRINGS, Pa., July 30.—Of the five runabouts which left Saratoga last Saturday to decide the tie for the Hower trophy, three dropped out at Pittsburg, and the remaining two ended their long trip here yesterday. They were the two six-cylinder Great Arrow Pierces, Nos. 100 and 103, driven by J. S. Williams and Ed. Rettling; the two four-cylinder Stoddard-Daytons, Nos. 107 and 112, driven by G. P. Moore and R. C. Shirk, and George Weidely's, No. 104, four-cylinder Premier. On arrival here only the Pierces were left, and, rather than draw things out indefinitely, R. D. Garden's, No. 100, Great Arrow roadster was withdrawn, leaving Charles R. Clifton's entry the winner. The conclusion of what was generally anticipated to be a long and closely contested run-off came much sooner than expected, the perfect score of the Premier, which had been maintained for the first three days of the run, going by the board on the stretch between Pittsburg and Cambridge Springs on Tuesday, where the car broke its front axle through dropping into a washout. Weidely fixed it and reached Pittsburg in good shape, but was out of the running, of course.

This left the two Pierces and the pair of Stoddard-Daytons, and it looked as if the contest would be continued by these four, but at a meeting of the contestants it was decided to withdraw the Dayton roadsters. The reason for this lay in the fact that the two cars are the property of individual owners, over whom the factory had no control prior to the run-off, and it was in accordance with their wishes that the cars were withdrawn. This eliminated all but the Great Arrow contenders, and the withdrawal of R. D. Garden's entry left Charles R. Clifton's Pierce roadster the winner of the Hower trophy, thus putting an end to Dai Lewis' work in the perfect score two-cylinder Reo of R. M. Owen, which has been acting as a confetti car for the Fifth Annual A. A. A. Reliability Tour.

VICTORIOUS THOMAS RECEIVES AN OVATION IN PARIS

PARIS, July 30.—Nothing could stand out in sharper contrast than the reception accorded the winning Thomas car on its entry into the French capital and that which the Germans received a few days previous. "Vive le voiture Américain!" was the popular cry of the day that greeted the triumphant American crew all the way from Meaux, 25 miles out of the city, where a large escort of cars met them, until they arrived in front of the *Matin* office. When, at eight in the evening, the Thomas, with the Stars and Stripes floating out behind, made its way to the Place de l'Opéra, the enthusiasm was unbounded. In front of the Café de la Paix, a gendarme stopped the car and placed Schuster under arrest for not having a light. Protests and explanations were unavailing. A cyclist offered the lamp from his machine, but it could not be detached, so the bicycle was lifted in the car.

At the *Matin* offices an informal reception was tendered George Schuster, George Miller, Captain Hans Hansen, and George McAdam, staff correspondent of the New York *Times*.

Schuster has suffered severely from the strain of the trip, and would not repeat the experience for any consideration, but he is the happiest man in Paris to-day. "We started from New York February 12, and here we are," he said, when interviewed. "It has been a wonderful journey, but it has been extremely hard, and if it had not been for the life in the open, probably none of us would have been able to stand the hardships. Siberia is certainly no place for the automobile, but it's all over now. We have won, and we are perfectly happy."

NEW YORK, Aug. 3.—Upon receipt of cable advices that the Thomas had reached Paris a winner in the round-the-world race by the ample margin of 26 days, Harry S. Houpt and John Elliott Bowles, who were greatly responsible for the entry of the Thomas car, were the recipients of general congratulations from American automobilists, many of whom declared the trip was the most remarkable evidence of American perseverance and grit and the most conclusive demonstration of the ability of the modern automobile that could be afforded. There is a plan afoot to tender the winning crew a reception on their return here, in order to give the men an opportunity of telling of some of their experiences at first hand to those who have followed their adventures through the columns of the newspapers.

When interviewed at Buffalo after learning of the arrival of the Thomas at Paris, E. R. Thomas said: "In the New York to Paris race, not only an American car, but also American tires scored an important triumph, the Diamond quick-detachable tires used giving excellent service. While the Thomas stock car won the race round the world, covering a distance of 13,431 miles by the comfortable margin of 26 days, it is particularly gratifying to me to know that the car was the only one which went the official route. The Thomas traveled 2,385 miles more on land under its own power, and 3,246 miles more at sea—a total of 5,031 miles more—than its nearest competitor, which shipped from Pocatello, Idaho, to Seattle, thus avoiding the severest portion of the trip across the American continent."

KNOX SCORED IN WILDWOOD STRAIGHTAWAYS

WILDWOOD, N. J., Aug. 3.—The Knox collared everything in sight to-day in the classes to which it was eligible, the Buick getting away with the small car classes and the Stanley having a clear field in the steam events. Between them, Bourgue and Dennison captured seven races with their twin Knoxes, including the free-for-all, in which each won a heat, and in which Bourgue finished second to Dennison. The Knoxes also ran one, two in the mile and kilometer time trials, Dennison beating out his confrère in both in the fastest times of the day—:47 2-5 and :28, respectively. The Stanley was the place car in both trial heats of the free-for-all, but in the final the flying back of the hood of Vennell's car, which had been imperfectly fastened, put its driver temporarily *hors de combat* and rendered necessary the services of a physician to sew up the resulting cut in his head.

The races were not nearly so interesting as those of last Fourth of July, Saturday's rain resulting in the scratching of many entries. The chapter of mishaps, which began with the accident to Swain and Overpeck on Thursday, was continued this morning, when "Dick" Sellers, chairman of the contest committee of the Quaker City Motor Club, had his right shoulder dislocated by being catapulted from the Pennsylvania Vanderbilt car, driven by Richard Williams. While speeding back toward the start the top of the battery box fell into the open machinery and blocked the brake clutch. The choice lay between a dash into the ocean and a sharp turn up a cross street. Williams preferred the latter, and the car turned a complete flip-flop. Seller's dislocation was reduced by a local surgeon. Williams got off with a few scratches.

The course was fast, and, considering the horsepower of the contestants, the times made compared favorably with the :42 3-5 record on the Fourth of July. Following is the summary:

MILE TIME TRIALS. OPEN TO ALL.

1.	Knox	A. Dennison	:47 2-5
2.	Knox	Wm. Bourgue	:48 4-5
3.	Parkin	J. W. Parkin, Jr.	:50 2-5
4.	Sharp-Arrow	W. H. Sharp, Jr.	:53
5.	Buick	Ed. Wilkie	1:08

KILOMETER TIME TRIALS, OPEN TO ALL.

1.	Knox	A. Dennison	:28
2.	Knox	Wm. Borgue	:29 1-5
3.	Parkin	J. W. Parkin, Jr.	:30
4.	Stanley	D. Walter Harper	:31 3-5
5.	Buick	Ed. Wilkie	:41

FREE-FOR-ALL.

(First Heat.)

1.	Knox	Wm. Bourgue	:49 4-5
2.	Stanley	D. Walter Harper	:50

(Second Heat.)

1.	Knox	A. Dennison	:50
2.	Stanley	Walter Vennell	:53

(Final Heat.)

1.	Knox	A. Dennison	:50
2.	Knox	Wm. Bourgue	:50 4-5

FREE-FOR-ALL FOR STEAM CARS.

1.	Stanley	D. Walter Harper	No Time Taken
2.	Stanley	Walter Vennell " " "	

GASOLINE STOCK CARS UNDER $1,250.

1.	Buick	Ed. Wilkie	1:22
2.	Middleby	Wm. Smith	1:22 2-5

GASOLINE STOCK CARS, $1,251 TO $2,000.

1.	Buick	Ed. Wilkie	1:19
2.	Middleby	Wm. Smith	1:19 2-3

GASOLINE STOCK CARS, $2,001 TO $3,000.

1.	Knox	Wm. Bourgue	:54 2-5
2.	Sharp-Arrow	W. H. Sharp, Jr.	:55 2-5

GASOLINE STOCK CARS, $3,001 TO $4,000.

1.	Knox	Wm. Bourgue	:50 4-5
2.	Parkin	J. W. Parkin	:51 2-5

FOUR-CYLINDER GASOLINE STOCK CARS OVER $4,000.

1.	Knox	Wm. Bourgue	:54 2-5
2.	Stearns	H. A. McNichol	:56

SIX-CYLINDER GASOLINE CARS.

1.	Knox	Wm. Bourgue	:50 4-5
2.	Parkin	J. W. Parkin, Jr.	:51 2-5

WILDWOOD, N. J., Aug. 1.—Bad weather and luck have marked the midsummer meet of the Motor Club of Wildwood up to date. The climax came when the officials, after a thorough trial of the Central avenue boulevard course, reluctantly postponed the races scheduled for this afternoon until Monday.

Speeding along the country road between Hammonton and Egg Harbor late Thursday night, ex-President "Charlie" Swain and "Doc" Overpeck, prominent in the Quaker City Motor Club, met with a serious accident, which not only necessitated their removal to the German Hospital in Philadelphia, but spoiled the invitation run from Philadelphia to Wildwood, of which the injured men were to have been the finish judges. Just before reaching Elwood, Swain's Apperson "Jack Rabbit," with Overpeck at the wheel, came suddenly upon a buggy without a lamp, and in his effort to clear it the "Rabbit" struck a muddy spot, skidded into and across the ditch, finally bringing up against a tree and turning turtle. Both men were caught beneath the car, and, with no help near, Swain, with several fractured ribs, managed by almost superhuman efforts to work his way out and drag Overpeck to the roadside. About daybreak Swain went to summon help, and with the aid of a farmer's wagon conveyed Overpeck to DaCosta, where a train from Atlantic City was stopped and the injured taken to Philadelphia.

The news of the accident cast a damper on the invitation run, which, however, was run off as per schedule, and was won by Paul P. Huyette, who drove his 35-horsepower Peerless over the course in the exact time previously agreed upon by the committee, arriving here at 5:15 o'clock in the afternoon.

Threatening weather and the accident combined rendered necessary the postponement of the meeting of protest against the Frelinghuysen law, originally scheduled for Friday night, until to-night. Five hundred enthusiasts, however, were on hand when Chairman Thomas Martindale called the meeting to order. After a comprehensive statement of the present conditions by the chairman, the following resolution was introduced by Carl A. Haswin:

Resolved, That we pledge our united efforts to secure just legislation as well as to remove this oppression and persecution, and be it further

Resolved, That, failing in any other way to obtain the relief which we so much need, we will use our influence to secure the election to the next Legislature of men who will pledge themselves to support what we believe to be just and merited legislative measures affecting motorists, and be it further

Resolved, That we appeal to the press of New Jersey and Pennsylvania to support the motorists in their movement to obtain for themselves a square deal from the Legislature of New Jersey.

In seconding the resolutions Senator J. Thompson Baker took occasion to characterize the present automobile laws of New Jersey as "a disgrace to the fair name of an illustrious commonwealth." Secretary Edwin S. Nyce, of the Norristown (Pa) Automobile Club proposed that all manufacturers of automobiles and accessories in New Jersey be asked to financially assist in fighting the present law. The proposition was favorably received, after which many present, including the winner of yesterday's run, Paul B. Huyette, detailed their experiences with the present law. He said he had been arrested but once—in New Jersey.

ANOTHER FRENCH COMMERCIAL VEHICLE TEST.

PARIS, Aug. 1.—France is to have another commercial vehicle competition this year, the special type of automobile provided for in the recently announced contest being light delivery wagons, taxicabs, and hotel and railroad omnibuses. The competition was originally announced early in the year by two Parisian journals, but on the request of the Automobile Club of France, which had its own trials in view, was indefinitely postponed. The date has now been fixed for the month of October, the exact date and conditions to be announced later.

Ferber Aeroplane Making One of Its Successful Trial Flights at Issy-les-Moulineaux, Near Paris.

FERBER AFTER DELAYED HONORS.

PARIS, July 30.—Captain Ferber, the French aeronautical army officer who put both Delagrange and Henry Farman on the road to success in the matter of aerial flight, has just brought forth his own flying machine. The apparatus, which made its first public appearance at Issy-les-Moulineaux last week, was first built in 1904. Various difficulties prevented it being brought before the public, and in the meantime Farman and Delagrange became interested and had similar models constructed, with success so familiar to all the world. In November, 1906, Ferber's machine was lying at Chalais-Meudon waiting for suitable weather for a flight, when orders came from the military authorities that the ill-fated dirigible *Patrie* was en route and room must be found for it in the shed. The Ferber aeroplane was consequently turned out of doors, to perish miserably a few days later in a violent storm.

Annoyed at the loss of his apparatus, Captain Ferber asked to be put on half pay, and since then has been privately at work on various aeronautical devices. The machine which came forth this week is the reconstructed *No. 8* lost in the November storm of two years ago and in general lines is similar to the now familiar Farman and Delagrange flyers. The raising and lowering rudder is in front, a horizontal and vertical rudder is carried at the rear, and at each extremity of the main plane is a jib to facilitate turning. The motive power is a 50-horsepower eight-cylinder Antoinette engine driving a two-bladed propeller forward. The pilot sits behind his engine on a swinging seat composed of two leather straps. After the preliminary trip to test the various parts, the captain will commence a series of flights in which he hopes to beat his younger rivals.

The most noticeable difference between the Ferber and the Farman machines is in the location of the engine and propeller. Ferber's engine carries the propeller on the front end; Farman's, on the rear, this seeming a much more natural arrangement.

FARMAN DOES SUCCESSFUL FLIGHTS.

After some quick work in setting up and tuning his aeroplane, Aviator Henry Farman made his first flight in this country Friday, July 31, before the members of the Aero Club of America and a number of pressmen. The field of the Brighton Beach racetrack was not in the best of condition, several gullies having been roughly boarded over and a pile of lumber having been left in one corner. The wind currents, too, were very irregular. In spite of these drawbacks Farman made two flights of several hundred yards each diagonally across the field, at a height of about fifteen feet. The third flight he made to oblige a disappointed photographer, and many thought it the prettiest of all. He simply started the engine and the machine jumped into the air, with only a few yards preliminary run.

A large crowd turned out Saturday to see him fly, but were disappointed. The wind was blowing half a gale, and, although the aviator waited until sunset, it did not go down sufficiently to make any attempts advisable. Sunday conditions were better, although by no means ideal, and the aviator again made several flights diagonally across the grounds. The next day he increased the distance; after flying about 300 yards straightaway he swung the machine around in a large arc toward the stands, covering altogether about 800 yards. In another flight he attained a height of about 30 feet, and came down smoothly and without a hitch. The perfect control Farman had over the aeroplane was noticeable on all occasions.

By way of description it may be said that the machine is 32 feet across the wings and about the same length from the front balancing plane to the tip of the tail. The aviator sits at the junction of the wings and tail, and controls the direction and elevation by a steering wheel. Just behind him is the motor, an eight-cylinder, 50-horsepower Antoinette, with a two-bladed propeller mounted directly on the rear end of the crankshaft so as to enable it to exert its force directly backward.

Captain Ferber, Originator of the Farman Type of Aeroplane.

Henry Farman Alongside His Aeroplane at Brighton Beach.

AMERICA AGAIN WINS HARMSWORTH TROPHY

IN a closely contested and exciting race in Huntington Bay, L. I., Monday, August 3, the *Dixie II.* beat the English challenger, *Wolseley-Siddeley*, and won the right to keep for another year the British international motorboat cup, usually known as the Harmsworth trophy, and open to all comers.

Five boats started in the race: the *Wolseley-Siddeley*, owned by the Duke of Westminster and captained by Noel M. Robbins; the *Daimler II.*, of Lord Howard de Walden, another challenger; E. J. Schroeder's *Dixie II.*, Capt. S. B. Pearce; Capt. John Sheppard's *U. S. A.*, formerly the *Irene;* and the little *Den*, entered by Commodore Joseph H. Hoadley, of the Motorboat Club of America. The course was triangular, running out to a stake boat in the sound beyond Eaton's Neck, then west along shore to a mark off Lloyd's Neck, and then back to the starting line in Huntington Bay; it was circled three times, making thirty nautical miles in all. The *Dixie's* official elapsed time was 1:04:57, to the *Wolseley's* 1:05:46; the averages figure out at 27.75 and 27.35 knots an hour, respectively.

"Dixie II," the New Cup Winner.

Instead of the forty-mile norther that caused the postponement on Saturday, a light easterly breeze was blowing across the bay, just strong enough to raise a few whitecaps; the water was a blue as deep and clear as that along the Riviera, flashing in the bright sunlight. All the terraces and the bluffs around the harbor were crowded with spectators. At 2:30 o'clock, the time set for the start, all the racers were under way and moving about waiting for the signal. At 3 o'clock the signal whistle finally blew. Captain Pearce, of the *Dixie,* took up a position just behind the line, and when the starting signal was given he jumped the boat ahead and got across just 14 seconds later. The *Den* made a quick start and was next over, closely followed by the *Daimler* and the *Siddeley;* the *U. S. A.* was late, owing to a slight accident. Two minutes after the gun the racers were far out in the bay, and could only be distinguished by the waves they threw up. At the first stake the *Dixie* had kept her lead, but the two English boats had passed the *Den* and were close behind. On the westerly leg the *Daimler* showed good form and gained about three lengths on her sister boat, but soon after rounding the buoy a piston in the starboard engine seized and she failed to complete the first lap. The *Dixie* passed the stake boat 37 seconds ahead of the *Wolseley*, and Engineer Rappuhn signaled that the wheel was turning only 750 revolutions a minute, 150 short of its maximum, showing that she had a good reserve.

On the second lap the *Wolseley* did her best work, and gained 21 seconds. Coming down the last leg Captain Robbins held straight to his course and flashed past the stake boat in a cloud of white spray, with only a few feet to spare. But before the first mark out in the sound was reached the *Dixie* was again increasing her lead, and try as the English boat would the gap between them grew larger. As the *Dixie* came down to the finish she seemed to be steering a trifle wild, and then the watchers could see that Captain Pearce was dashing water upon his mechanic with one hand while he held the tiller with the other. She crossed the line 49 seconds in the lead. A number of small boats with doctors on board immediately put off to her, and it was found that Engineer Rappuhn had been overcome by breathing the exhaust gases from the engine. A moment later Captain Pearce toppled over also, but both revived when carried ashore, and suffered no ill effects. The trouble was due to the position of the muffler, which had been hastily installed just before the race. Captain Robbins, of the crack British boat, took his defeat philosophically, and admitted that the best boat won. Summary:

The "Wolseley-Siddeley," Which Finished Second by 49 Seconds.

Boat.	Elapsed Time.	Knots per hour.	Miles per hour.
Dixie II.	1:04:57	27.75	32.00
Wolseley-Siddeley	1:05:46	27.35	31.05
U. S. A.	1:15:11	23.90	27.65
Den	1:20:47	22.50	25.65
Daimler II.	Disabled.		

Ex-Commodore E. J. Schroeder, of the Motorboat Club of America, won the trophy last year with the *Dixie I.* When he received the English challenge this year he commissioned Clinton H. Crane to make him a new boat. Crane and Whitman built the motors, and Frank Woods the hull. The *Dixie II.* is 49 feet 6 inches long, and her engines develop 200 horsepower. In a mile speed trial over a measured course the day after the race, the *Dixie II.* made a speed of 36.4 nautical miles per hour, which shows how much better she could have done, if pushed.

CARS FOR PASSENGER USE IN AND ABOUT CITIES

THERE is a very close line of demarcation, as yet barely recognized, between the vehicle popularly known as the taxicab and the town car. At the same time full appreciation is given the fact that certain manufacturers advertise their goods simultaneously as taxicabs and town cars, and undoubtedly they themselves are versed in the existence of the difference between types which they would familiarize as synonymous. It is equally certain, though, that there are very many individual concerns in the industry, to say nothing or laymen, who have no real conception of the differences demanded by circumstances and by service from vehicles that ply for hire within a city and its environs and a private carriage for use in the same neighborhood. Probably a tabulation of the differentiated requirements will be the best means of bringing the conditions forcibly to the mind of the reader. Scanning such a tabulation we find:

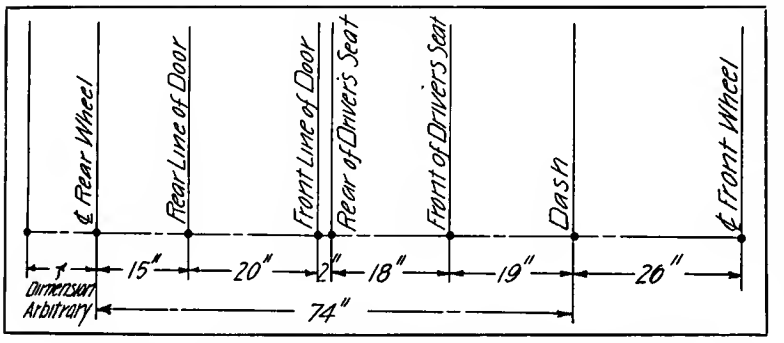


Fig. 1.—Showing a permissible wheelbase of 100 inches in the layout of a cab chassis.

REQUIREMENTS OF THE TAXICAB.

1. It must be eminently serviceable and in lieu of absolute reliability must be easy of immediate repair.
2. It must comply with police regulations regarding turning radius.
3. Of reasonable comfort and capacity; appearances are secondary to certain other considerations.
4. Its internal operations must be entirely automatic to avoid trouble with unskilled treatment.

FEATURES OF A STANDARD TOWN CAR.

1. While reliability is essential, means for rapid handling of repair are hardly as important.
2. There are no police regulations on its construction or performance.
3. Maximum comfort for rated capacity is absolutely essential.
4. Appearances are everything.
5. Its cost is comparatively immaterial.
6. Better treatment can be counted on.

Thus the designer is confronted with two entirely different problems—the one calling for serviceability above all things and the other for extreme luxury under all conditions. It is, of course, rash to aver that the two cannot go hand-in-hand, but it is not injudicious to state definitely that the requirements of a town car de luxe cannot be satisfied by the dimensions which have been relegated to the taxicab for hacking service.

Examine the limiting factors in both cases. The regulations of the administration call for the vehicle plying for hire turning within a fixed radius of such small dimensions that wheelbase is especially restricted. Wheelbase being restricted, each and every one of the items of the make-up must be proportionately restricted unless internal sacrifices of space are made. Hence, wheelbase is the determining point of a taxicab design, nor does any specified form of steering help to release its control of the situation inasmuch as the maximum angles of steering wheels are defined by inflexible dynamic considerations.

What May Be Deemed Essential in the Town Car.

Follow now the case of the town car and its requirements. What is the first desideratum? Undoubtedly capacious comfort, or comfort and capacity equal to that of the vehicle in the place of which it substitutes itself—the private brougham. No governmental restrictions are incidental to the use of a town car, hence there are no wheelbase dimensions which cannot be exceeded at the discretion of the designer. Above all, the town car is a carriage, and as a carriage it is the luxurious perquisite of a class of people having educated discrimination between the seemly and the unseemly in the art of outline—the limitation of service and the taste of their possession in a vehicle that must be designed as much for one as the other.

These things it is eminently essential that the would-be producer of town carriages should remember, for, bearing them in mind, he must necessarily commence the laying of his design upon foundations which will appeal to his mechanically educated senses as more than premature. In other words, he must start with the carriage and duly build his propulsive mechanism about it—a truly revolutionary suggestion to the motor car designer, though less startling at the present time than some two or three years ago.

Head room and leg room, door space and floor height, seat location and cushion bulge—all these things have been developed by many generations of carriage builders, and if so why seek further for information? Ask any of the first-class carriage builders whose names are household words in the class whose trade you are after what they consider the ideal design for a brougham, a coupé, a victoria, or whatever you desire to build. Let them define what they, with years of experience of a trade into which you are about to break, would consider the perfect vehicle—a *chef d'œuvre*—and from the results of decades of cut-and-dried methods that will be so unobtrusively correct in these details of dimension so difficult to develop or steal that there is no need to seek further or waste another decade in research work after that which is already so well known as to be standard.

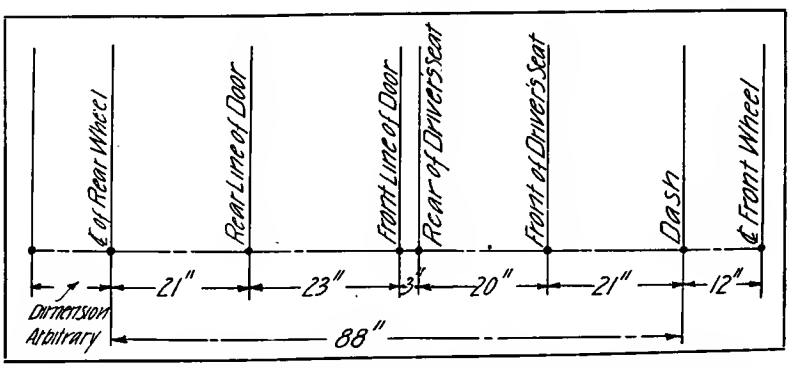


Fig. 2.—Morris chair effect given to driver's portion of body built on century wheelbase plan.

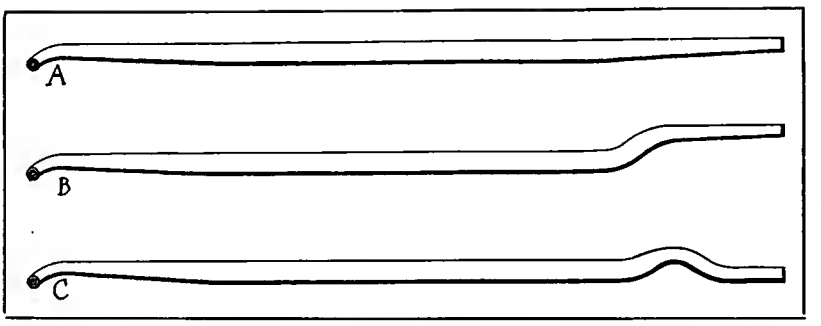


Fig. 3.—Showing three types of frame design applicable, each having specific uses.

Chassis Should Meet the Requirements of Body.

Mark well in this, that the way to secure such data is not to supply a chassis and demand a perfect body built to it. Such a procedure will only call forth much unnecessary exercise of ingenuity upon the part of the carriage designer who will do his best and at that produce work unsatisfactory to himself. Secure as a starting point the ideal lines by a master of the approach to perfection in the passenger section of the vehicle; forget the driver, the driver's companion, luggage accommodation, accessory attachments—be oblivious of all these disturbing elements—and then, having secured the nucleus—the pearl of desire—commence to construct about it, by synthesis as it were, the oyster necessary to bring its being in the shape of a suitable chassis.

The critic may aver: "This is only an assertion; how can I be expected to work a chassis around a carriage builder's job? Why, if they had their way," etc. Too frequently the carriage builder, left to his own devices to avoid some crook of design, for which he is not responsible, perpetrates abominations; but left to his trade the carriage designer has a respect for purity of line, complementary angles and supplementary curves, mingled with an honor for re'entrant tendencies that invariably eventuates in a simple beauty rarely noticed where his work is curbed by lines created and abhorrences forced upon him by unbending circumstances.

Where the Town Car Differs from the Taxicab.

And having secured the ideal for the part that matters—the carriage—it is really quite easy to do the rest. "Quite easy," is said advisedly, for it must be so relatively speaking, when one considers the extraordinary amount of ingenuity misplaced in getting around things to use some idea or other which is really not worth while anyway and certainly not vitally important as is the carriage arrangement of the vehicle, the alpha and omega of whose purpose is that of a town carriage, whose very acquirement indicates a desire for luxury.

Possibly the difference in the manufacture of the town car and the taxicab may be described by indicating the difference in the buyers of each. It is mind and matter respectively. Ten to one the town car customer is appealed to by the style, the taste, the color, some fittings—by detail only; in other words by a chimera. Is it not a matter of record in 90 per cent. of the cases the women swing the sales? Not so with the taxicab buyer. In vulgar parlance, "he's from Missouri," and when he takes his demonstration he's not very anxious as to the taste of the make-up. What he wants to find is value, not toilet glasses. It's dollars present and dollars prospective with him, and he doesn't give the proverbial tinker's curse for the art of the thing. What he wants is results. So does the buyer of the carriage; but he likes a lot of art on the side as well.

Elements which are essential to a good town car are almost undesirable in a taxicab. Thus, comfort for capacity is a *sine qua non* with the town car, but tends to overloading with a taxicab. And, although a taxicab should be sufficiently roomy, the fact that it is included in the class of vehicles that ply for hire renders it equally liable to the shopping tour of "miladi" at noon and the rowdy pack at midnight, the last mentioned fare being apt to be weighty and undesirable from more points of view than just its own discomfort.

Hence the existence of the line of demarcation, already spoken of, will be generally acknowledged by those who will consider the matter, and therefore it is meet to proceed to dissect differences to the point of diversity of practice, for with vehicles differing so widely the mechanical practice must of necessity vary to a certain degree. In the first place, the town car must obviously be the more powerful, for, with greater wheelbase and more commodious body work, its weight calls for a higher engine capacity. Also, since there is a possibility that the chassis work may have to adapt itself to the body work, rather than vice versa, some specialized constructional scheme may be necessary that is not involved in the taxicab layout. These are all considerations that must be taken into account in the design of these small vehicles for urban service, whether of a public or private nature and particularly in the latter case.

Clearance of Taxicabs an Important Consideration.

Next comes the all-important mention of road clearance, a question the solution of which is attended by no mean difficulty, inasmuch as it should be low—close lying to the road surface, the vehicle for town use has yet to contend with conditions from time to time which demand that it shall be possessed of ample clearance. This difficulty presents itself and, insidiously tardy in the forcefulness of its realization, is a real nightmare to the designer, who finds himself faced at every turn by troubles directly traceable to the necessity of this clearance. Thus a straight line drive is not only desirable but well-nigh essential for a chassis to operate efficiently and continuously without either undue power loss or extraordinary wear. Also, it is injudicious for obvious consideration to raise the frame of a city vehicle further than 25 inches from the road surface, this dimension being arbitrary irrespective of wheel diameter.

Considering 34-inch wheels as the maximum size likely to find favor in the eyes of the designer and producer, and a straight line drive parallel with the line of the frame, it will be obvious that the clearance with a normal flywheel is somewhat low. What alternatives

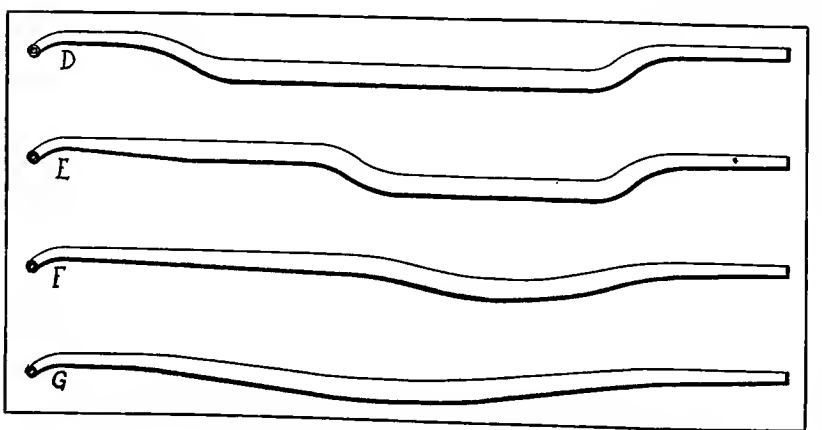


Fig. 4.—Four varied types of double drop frame design, showing the possibilities.

present themselves? The engine may be raised at the expense of angularity being introduced in the propeller shaft; an inclination may be given to the engine to correspond with an inclination of the driving axis sufficient to provide the clearance beneath the flywheel, this being one of the most important problems of the design.

Some Characteristics of the Main Chassis Types.

Figure 7 shows an arrangement entirely conventional, very common and as reprehensible as frequent. So much has been written upon the loss of power in transmission through universal joints that the writer feels it unnecessary to emphasize the undesirability of such an arrangement. Figure 6, depicting the inclination of the whole driving axis, is excellent in many ways, has many ramifications which we will look into later, and, provided certain conditions are not complied with, remains by far the most generally satisfactory way out of the trouble. The last solution is, to the writer's mind, the best of any, but of this more later, as there are coincident reasons which will appear later in this monograph. Regarding ramifications of the inclination system of providing a sufficiency of clearance there are two which are deserving of close attention, namely, that used respectively by the Rover company in England and the Nordyke & Marmon company in this country.

Fig. 7 will make this modification clear and its commendable points are not few. Fig. 7 illustrates the direct adaptation of the inclined drive to a construction such as shown in Fig. 6. This latter is probably the better for all-round work and for manufacturing purposes. In either case the clearance beneath the flywheel is easily modified to suit any limiting conditions existing, so the real issue is to investigate the influence of the inclination to the functions of the motor. The only difficulty lies in the problem of the lubrication, and in the selection of a lubrication plan which is independent of the inclination of the crankchamber. With a single-cylinder motor almost any system would be satisfactory; with a multi-cylinder engine it will be evident that the auxiliary splash system—so often the only system—is almost out of the question, inasmuch as the rear cylinder would normally be in a state of oil flood while the forward ones starved, causing the motor to seize.

It may be argued that individual compartments to the crankchamber would supply the want. With an overflow system in conjunction with a pump feed it might do, but from the point of view of economics results against installation expense. A complete force feed system is preferable, making the motor entirely independent of position under any conditions.

The Century Wheelbase as a Ground of Basic Design.

Basing the layout of a cab chassis upon a permissible wheelbase of 100 inches, it is easy to determine the proportioning of the space from rear frame bar to dashboard, which can be approximately ascertained by a glimpse at Fig. 1. According to the hypothetical dimensions shown the body builder has 74 inches from the rear face of the dash to the center of the rear wheel, and whatever over this he thinks he can do with. These dimensions are modified somewhat in Fig. 2, which is a series of dimensions which would accommodate an uncramped coupé body. Here is a dimension of 88 inches from dash to wheel center or a matter of 14 inches in wheelbase, all other conditions being the same as in the former.

In the case of the cab chassis the dimensions shown are not capable of any wide range of variation, nor

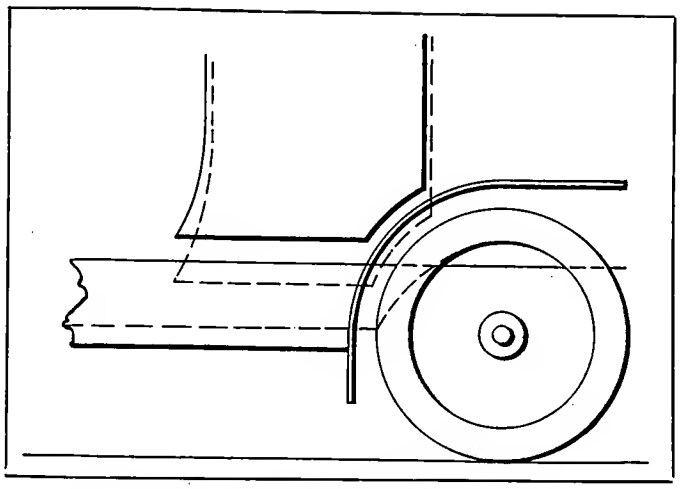


Fig. 5.—Location of door when a straight frame is used.

is such a machine a dream of comfort from the driver's point of view. On the other hand, economy of driver's space is absolutely necessary to give any kind of door room.

Now in the dimensions shown a Morris chair effect is given to the driver's portion of a body built to the hypothetical dimensions in Fig. 2. A low slope to the footboard is indispensable and the seat must be at least 16 1-2 inches high to the top of the cushion from the floor line, this latter, of course, being determined from chassis design; but there is ample room for a good door, sufficient space to prevent the use of a concave corner to the door for fender clearance being necessary and sufficient room between door and rear wheel center necessary to insure a minimum overhang of body with reasonable regard to economy of wheelbase. The ideal would be to have the frame rear bar about two to three inches inside the rear wheel center, but then the wheelbase immediately ascends to a figure that is impossibly high for the purpose in view.

Desirability of the Low Body Carriage.

Now go further and examine the diverse problems in the process of the selection of a frame design. Figs. 3 and 4 reveal known types of these: *A* is the ordinary straight frame—excellent and by no means impossible of utilization. *B* is the single raise, or, as is commonly known, the single drop frame, the rear end being raised to give clearance to the rear axle. *C* is known as a "kicked" frame and is simply a straight frame with clearance provision. *D* is the crude form of what is known as the "double drop frame," depressed to lower the center of gravity of the assembled machine and raised again for clearance purposes. *E* is a similar form but depressed only for the body space. *F* is a very highly developed form used by a few European firms and by one well-known American company. *G* is a type unknown but probably nascent, since it would be much easier of manufacture than either of the others.

Now it will be obvious to the reader that it is a quite desirable

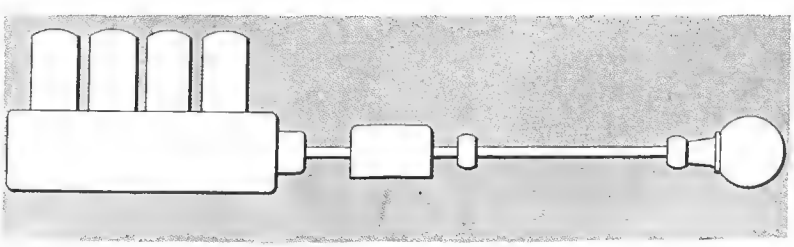


Fig. 6.—Straight line drive direct from motor to rear axle.

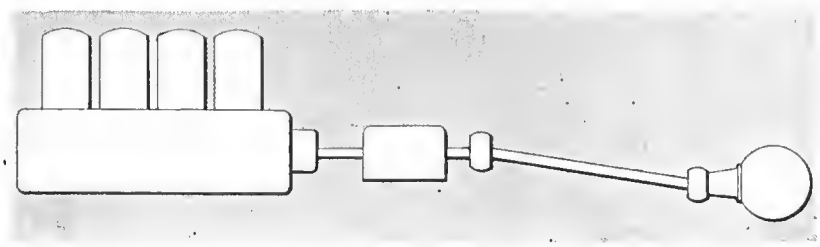


Fig. 7.—Conventional transmission arrangement with universal joint.

thing to secure as low a body suspension in conjunction with reasonable clearance, and consequently frames such as indicated in the series *D, E, F* and *G* are desirable from this point of view. On the other hand, they are more expensive to press, less strong and, lastly, more expensive to assemble. But these matters are more than compensated for by the scope provided for the designer to accomplish beautiful carriage lines—low suspension—and to abolish running boards. This for the town car. With the restricted wheelbase of the taxicab the only possible frames of this pattern are those shown at *E* and *D*. The depression of the center of gravity preserves the appearance of the machine when complete except that a running board would be dispensed with. It strikes the writer that the straight frame, stronger and cheaper as it is, has claims not to be superseded. By straight frame in this connection is meant either of the frames shown at *C, B* or *A*, with due regard to the pattern of spring suspension which may be employed.

It will be readily appreciated that the double drop frame is not easily to be employed for taxicab chassis when the relation of the door to the wheel fender is considered. Thus in Fig. 5, a straight frame being used, the door may be located as shown by the full lines, whereas a drop in the frame lead, the wheel and fender remaining as before, the designer immediately encounters an interference of some magnitude which can be avoided only by an increase of wheelbase if other dimensions are fixed. The conclusion that the straight frame is the only possible type for cab construction has been borne in forcibly upon the writer only after a very close investigation of conditions, possible variations in existing systems and costs involved in a successful design and conclusion equally strong in favor of the cradle frame for town cars has been reached.

In the Matter of the Transmission Types.

Pass to the transmission system. There are three fundamental arrangements possible—planetary transmission or sliding gears for the speed-change, and the location of either in a separate unit just back of the motor, or in combination with the rear axle.

It is eminently desirable that a vehicle for town use shall have four speeds, for not only is its power limited by reason, but the call for rapid acceleration is more frequent than with a vehicle primarily designed for open road work. Highly developed accelerative properties in a motor car speak of two things—extraordinary engine power or nice proportioning of gear ratios. The old and foolish idea that a machine having two speeds only can reach its maximum speed as quickly as another of similar power with a plurality of speed changes has died a quiet death, even as the two-speed fetish has subsided. The three-speeded car, even with six cylinders, is to be replaced by again having four changes in many cases. These things spell retrograde evolution to the theorist but satisfaction to the operator.

This leads back to the old standby, sliding gears, and it is necessary to decide first what ratio to adopt for the relation of the speed change to the drive. Figs. 8, 9 and 10 show some constructions possible with a conventional engine location. In Fig. 8 is seen the usual common or garden construction, the only variant of which lies in the use of a single universal joint in place of two. In Fig. 9 there is another conventional scheme in which the transmission is grouped about the rear axle center, and in Fig. 12 is a somewhat unconventional assembly in which transmission and axle are in unit form, but in which the transmission is grouped about the forward end of the propeller shaft. The problem then is to distinguish between the merits of the following alternative systems:

1. Arrangement such as shown in Fig. 8:
   A. Gearbox being entirely separate from engine.
   B. Engine and propeller shaft as a unit.
   C. Axle and propeller shaft with its housing as a unit.
   D. Propeller shaft as a unit in itself with supplementary radius and torque rods.
   E. Engine, gearbox, propeller shaft, housing and axle as a unit.
2. Arrangement such as shown in Fig. 9 subdivided as follows:
   A. Axle and transmission as single unit propeller shaft supplementary with radius and torque rods.
   B. Axle, transmission, propeller shaft and housing are one unit.
   C. Engine transmission, propeller shaft and housing as one unit.
3. Arrangement such as Fig. 10 with:
   A. Transmission, propeller shaft, housing and axle as a unit.
   B. Engine, transmission, propeller shaft, housing and axle as a unit.

Now if this tabulation be inspected it will be seen that the highest development in each individual system leads to the same conclusion, which conclusion coincides with that reached in course of discussion on clearance, wherein the inclined system either with its components assembled as a unit or in flexible mounting was outlined as the most likely type.

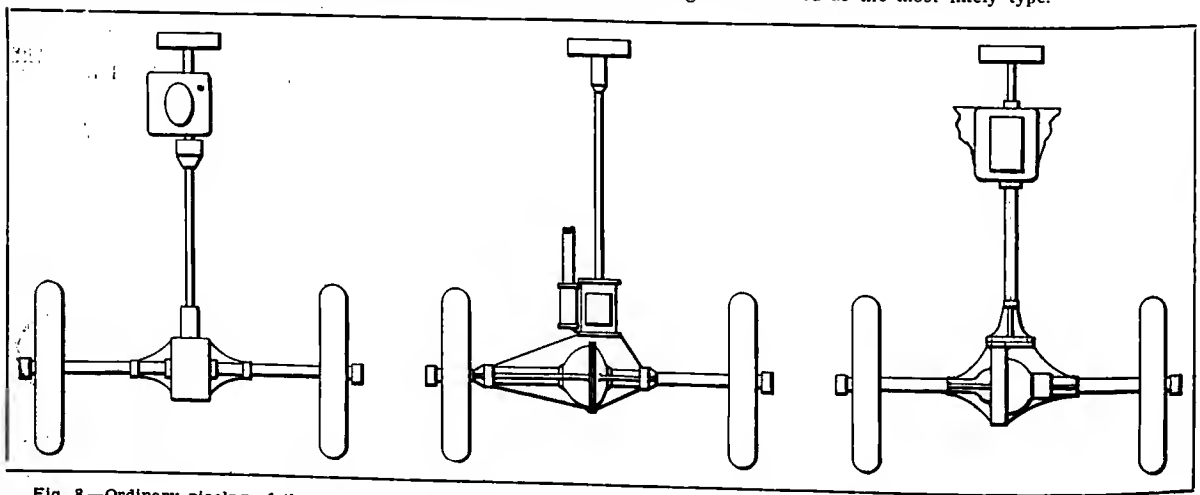


Fig. 8.—Ordinary placing of the gear-set. Fig. 9.—Transmission grouped about rear axle. Fig. 10.—Elimination of the torsion rod.

CALIFORNIA ADVANCED IN MOTOR FARM MACHINERY

By VICTOR LOUGHEED.

FROM the dawn of history the necessity for animal power in tilling the soil has been the heaviest burden on agricultural enterprise, subjecting it to uncertainties and a severity of labor through which, despite its fundamental importance to human welfare, it suffers by comparison with the more business-like organization of most other industries. Recognition of this great handicap upon what is the most vital and important source of the prosperity of nations has for some years been the inspiration of one of the most cherished dreams of automobile enthusiasts and progressive farmers alike—that the time is nearing when motor traction, in the form of automobile plows, harvesters, mowers, and the like, will give final and effective answer to this problem of the ages.

The nearness of this ideal to practical realization, however, is not generally appreciated even by those closely in touch with the main trends of automobile development, this being due not so much to lack of discernment as to lack of interest on the part of those more directly concerned with improvement in pleasure and commercial vehicles of the established types. For this reason it would come as a surprise to many to learn what a really large measure of success has already attended the working out of farm tractors and similar agricultural implements, numbers of which have been actually on the market and in severe service for some time. One of the most practical among those of recent appearance is the machine illustrated herewith. This machine, like most successful ones, is a highly specialized device, originally designed to meet peculiar local conditions—in this case the tilling of the orange orchards in the famous citrus belt of Southern California.

It is not widely known, though no less a fact, that the Golden State is an undoubted pioneer in machine harvesting—traction engines having been used in the San Joaquin Valley wheat fields for at least twenty-five years, in the production of crops from the thousands upon thousands of level acres upon which the fame of this great valley is founded. So far, most of these engines have been ponderous steam affairs, of prodigious weight and size, ranging up to twenty-one tons, and to such dimensions as twenty-four feet in over-all length, fifteen feet of width, and a height of twenty feet. Driving wheels eight feet in diameter, geared to a 110-horsepower engine, are a commonplace feature, and explain an ability to tow heavy loads over rough ground that is little short of amazing. Plows turning thirty-six ten-inch furrows at once, and harvesters heading, threshing, and sacking sixty-foot swaths from a wheat field are easily pulled by these machines. As tractors, loads of ore and lumber aggregating seventy-five tons are hauled on two or three trailers, while as much as thirty-five tons can be freighted up a fifteen per cent. grade. When it is considered that all this is not merely in the way of supplanting the horse, but in work for which the equine proves absolutely inadequate and unavailable, something of the attitude of California's bonanza ranch owners toward farming with power will be appreciated.

In the more recent exploitation of this field with internal-combustion engines, in which the Pomona Manufacturing Company, of Pomona, California, are the pioneers, the greatest demand seems to be for five or six-ton machines, of a compactness and simplicity not realized with the steam plants. By development in this direction, moreover, the advantages of traction plowing and cultivating are not only brought to the more numerous smaller land owners, but new possibilities are opened up in the field of orchard plowing, in which the great height and bulk of the steam machines are prohibitive.

Plowing Six Furrows at One Operation with One of the Specially Designed Auto Farm Tractors, in California.

These considerations have been the predominating influences in shaping the designs of the new gasoline machines pictured herewith, which are built with especial reference to use in close quarters and under the branches of trees. The lighter model, for example, is only five and one-half feet high, thirteen feet long, and less than eight feet wide, yet it has ample traction for plowing ten furrows at once in ordinary ground. The motive power so far has been supplied with ordinary two and four-cylinder four-cycle engines, of heavy marine and truck types, but experiments are now under way that in the very near future will lead to the use of lighter and more powerful engines, more nearly conforming to the most advanced automobile practice. The weight of these machines ranges from five to seven tons, with from thirty to fifty horsepower.

A heavy wrought and cast-iron frame forms the foundation of each vehicle, which is carried on four wheels—though the

Auto Farm Tractor as Seen from the Front.

two steering wheels practically amount to a single wheel, made in two adjacent sections to facilitate turning. The driving wheels are five feet in diameter and thirty inches wide, while the front wheels are each three feet in diameter and one foot wide. Their arrangement is such as to afford a three-point support on the ground, with the further advantage that the front pair track exactly the space between the two rear, so that all the ground is subjected equally to the rolling and flattening effect—beneficial in that it crushes clods and leaves a surface well adapted to conserve moisture. The steering wheels are each in one piece, of cast iron, and each has a circumferential rib to prevent side slipping. The rear wheels have been made of wrought and cast-iron elements in combination and of cast iron alone, but preference is now given to the latter construction, provided with suitable transverse ribbing to assist traction.

Steering is by means of a turntable ring surrounding the front wheels, carrying their axle, and arranged to revolve on a ball circle placed in a similar ring integral with the frame. By this construction the objectionable height that would be inseparable from any overhead-pivot construction is avoided. The steering post, which is considerably raked, bears at its lower end a worm meshing with a worm gear borne on the upper end of a short vertical shaft. On the lower end of this shaft is a drum that drives the steering turntable by means of a wire cable. In this way irreversibility is provided and reduction enough to afford ample leverage is assured.

The final drive is from pinions on a countershaft to large spur gears on the wheel hubs. At the center of the countershaft is a differential of regulation type, to the housing of which the drive is by another spur-gear set. The change-speed gear affords four speeds forward and two reverse, and consists practically of two separate sliding-gear systems, each affording two changes. One of these systems is made to shift while running, and the other practically amounts to an alternative final-drive ratio, capable of being changed from one setting to the other only while the machine is standing. A decided novelty of considerable interest as a means of evading an otherwise serious problem is the use of a momentum element in the transmission to keep the vehicle moving during gear manipulation. A multiple-disk clutch is used, thoroughly fool-proofed by enclosure in an oil bath protecting it from dirt and mud.

The working speed is from two to three miles an hour, anything in excess of this being found unsuitable for plows and other implements as at present constructed, though there is a strong probability that the development of motor machines in this field may lead to the design of implements that will work at higher speeds than the present types of horse-drawn devices. For traveling to and from the fields a road speed of five or six miles is provided, and this is also practical for traction work.

To combine a maximum of utility with a minimum of cost, standard coupling devices have been worked out to admit of the attachment of any sort of trailer to the tractor. Among the classes of machines thus arranged for there are—besides plows, seeders, and harrows for preparing the ground and planting grain by a single operation—various tools and trailers adapted to orchard cultivation, furrowing for irrigation, hauling fruit to packing houses, etc. For beans and some other crops a combined tool may be used, consisting of cultivator teeth to loosen the ground, weed knives for removing undesired growths, and smoothing teeth for pulverizing and finishing the ground ready for the planting of the crop.

To the field of road work, in which such great interest has been awakened of recent years by automobile users and other advocates of good highways, important applications of the new tractor are expected. Not only is it suitable for hauling plows, scrapers, and graders of the various types used in road-making, but its broad wheels, tracking heavily the whole width of the vehicle's tread, do away with the necessity for specially-built rollers, every purpose of which they fully serve, so that machines of this type will undoubtedly come into general use for road construction and repair work in this country within a comparatively few years, at the most.

EXPORTS FOR 1908 A SUBSTANTIAL FIGURE.

During the course of the last twelvemonth, ending with June, which terminates the government year, American manufacturers sent abroad no less than $4,656,991 worth of automobiles, and $620,856 worth of automobile parts, making a total of $5,277,847. Owing to the slight falling off that has been apparent in the returns of the past few months, this does not come up to the showing of $5,502,241, which was the total for 1907, although it shows a very substantial increase over the 1906 figures of $3,497,016. This is illustrated by the returns for the month of June, 1908, as compared with the same period a year ago, during which $732,054 worth of parts and cars were shipped out of the country, whereas this year the total only reached $710,722. Doubtless this falling off can be traced directly to the period of lessened activity last fall, for, as shown by the detailed returns, such countries as the United Kingdom, France, Germany and Italy, all of which are automobile producers themselves, have taken constantly increasing quantities of American cars and parts, the gain in values sent to Great Britain during the past year being more than a quarter million, while to France it was $180,000 in round numbers. The total number of cars sent abroad during the past year was 2,477, making their average value $1,880, which marks a very substantial increase over those sent in earlier years.

THE BEST WAY TO CHECK SPEEDING.

Chief of Police Donovan, of Portchester, N. Y., now believes that gentlemanly methods are the most effective in dealing with automobilists. Instead of setting ambushes and traps, he stations his men on the different roads leading into Portchester with cards to hand to the occupants of passing machines, welcoming them to the city and requesting them to observe the speed laws while passing through. Chief Donovan says that the plan has now had a fair trial and has been productive of results far beyond his expectations, as there has not been a single violation of the speed laws since the cards were distributed.

AUTO PATROL WANTED IN ST. JOSEPH.

St. Joseph, Mo., Aug. 1.—Chief of Police Frans is strongly urging the powers that be in this city to purchase an automobile patrol for the police department. The rapidity with which the city is spreading out in the northern and eastern districts will soon necessitate building sub-stations there unless automobile service is provided. While the first cost of the auto would be heavy, Chief Frans thinks that it would soon pay for itself by the saving in horseflesh, as well as by the far greater rapidity with which cells from outlying districts can be answered.

LETTERS INTERESTING AND INSTRUCTIVE

ABOUT TESTING OUT THE SPARK COILS.

Editor THE AUTOMOBILE:

[1,493.]—Will you pleaee inform me tbrough your query department how to test out the epark coils? I have never seen this stated and would like to have some light shed on the subject.

Leominster, Mass. C. F. NIXON.

There are several ways in which the spark coils of any automobile can be "tested out," so we are somewhat at a loss to know exactly what you wish. The test most commonly required by the average autoist, however, is that for the consumption of battery current, and on this subject we have published fully a score of letters during the past year, with more or less lengthy answers thereto. Take a low-reading ammeter, *i.e.*, one that is calibrated up to 3 amperes by tenths of an ampere, and insert this in series with the coil to be tested. That is, connect one terminal of the instrument to the battery and the other to the primary terminal of the coil, so that all the current which passes through the coil to cause the spark must go through the instrument, commonly called a coil-current tester, or meter. This must be done with the motor running under its own power, as a test made under any other conditions would be valueless for practical purposes. The needle of the meter will move every time the current passes and then drop back again to zero, but as good instruments of this kind are of what is known as the dead beat type, in that the movement of the needle is resisted by a counteracting force, and does not fluctuate constantly about the point at which it should come to rest, it will not be found difficult to gauge the current consumption in spite of its constant jumping, due to the current being entirely cut off each time the motor fires. Screw the trembler adjustment of the coil up or down according to the reading given by the instrument, until the coil is consuming the minimum amount of current that the motor will run on without missing. This should not exceed 0.50 to 0.75 ampere. The manner in which battery current may be wasted unconsciously may be shown by screwing one of the trembler blades down hard, which will cause the needle to register two to three amperes. Repeat the operation in the manner above described in the case of each coil.

TROUBLE WITH A GOVERNED MOTOR.

Editor THE AUTOMOBILE:

[1,494.]—In your "Letters Interesting and Instructive" will you give me your diagnosis of this trouble? My 4-cylinder engine runs perfectly when the throttle is open. But on the governor, it skipe the two forward cylinders entirely. Theee receive their gas through the same section of manifold, and I have removed and replaced with every care the manifold many times, and cannot find that there is a leak on that side whatever.

As soon as the volume of gas is increased through the throttle, Nos. 1 and 2 pick up with the rest, but not until the throttle is well open.

This causes the use of too much gas and makes the engine hard to handle and have uniform power on any low speed. Could this trouble be caused by anything else than a leaky manifold on that side? The compression in both forward cylinders is fine and equal to that in the two back ones, and the timing of the valves supposedly the same. LOVER OF THE SPORT.

Albany, N. Y.

If your investigations have satisfied you that there is no question of anything being wrong with the manifold, we should suggest cutting out the governor and running the engine as slowly as it is possible to do so by closing the throttle by hand, meanwhile observing its action. If it will run slowly when governed by hand in this manner and have each cylinder fire regularly, you will be able to put down the trouble as caused by the governor itself. There may be some derangement of the throttle valve, by means of which the gas to the two forward cylinders is cut off entirely when the throttle is partially closed and no fuel reaches them until it is opened to a certain point.

INTERESTING QUERIES ABOUT LUBRICATION.

Editor THE AUTOMOBILE:

[1,495.]—I have an engine with the crankcase divided into three compartments or crankpits. Will you tell me how I can, ueing splasb lubrication, keep the oil at a constant level, supply being from a tank, without using a pump or otber similar device?

I have been told that I can use some such arrangement as is used in the student's safety lamp, but I have been unable to find out what this is. I will be very grateful for any belp you can give me.

In your issue of July 23 I see that the oiling systems on the Franklin and Studebaker cars went out of commission, and that they finished with a perfect score by using only the splash. If this is sufficient, why use the oilers at all? M. E. M.

Far Rockaway, N. Y.

Probably the best way to accomplish this would be to take three independent leads from the gravity tank, one to each of the three compartments of the crankcase, placing a gravity sight feed on each one of them in a place where it would be readily accessible for regulation. By experiment, ascertain the proper level to maintain the oil supply in each of the crankcase compartments. This can be done by putting in what is known to be an excessive supply, and gradually reducing it to a point where the motor shows no signs of smoke at the exhaust, but where the bearings are still getting an ample supply of oil; some motors, owing to poor design, cannot be properly lubricated short of smoking. Having ascertained just what the proper level should be, the next thing to find out is how much oil should be fed per minute to maintain this level while the motor is running. A good sight feed can be regulated to pass anything from two or three drops per minute up to a steady stream, but doubtless it will be found that a feed of from 12 to 15 drops per minute will be about what is required for the average motor that does not show any tendency to run dry. The best material to make such a tank of is copper, and the best location for it is right alongside the motor, at about the level of the cylinder heads. In this position the oil will be subjected to a practically constant temperature summer and winter, while the motor is running, and there will be the minimum necessity for altering the adjustment of the feeds. By placing the tank as above indicated and adhering constantly to the same grade of oil, there should be little occasion for making any change in the adjustment of the feeds. Otherwise the greater or less viscosity of different grades of oil and its varying density with the temperature would tend to alter the rate of feed every time conditions changed. An equally simple, and far more positive, method of lubrication consists of maintaining the level in the crankcase by means of a reservoir and a pump. The capacity of the latter is such that it just supplies sufficient oil to insure the proper quantity, the oil running from the tank into the crankcase by gravity, being lifted again to the tank or reservoir by the pump. By this method the same oil is constantly circulated, sight feeds being put in the pipes to show that it is running. Such a system starts and stops with the motor, and comes as near to fulfiling the requirements of being automatic and self-contained as any that we know of. There are no adjustments to watch, and it is only necessary to clean out the crankcase and renew the supply every 300 to 500 miles, according to the efficiency of the motor in this respect. This is something that should be done on every car, regardless of the type of lubricator employed, as the oil remaining in the crankcase after that distance is practically valueless and should be replaced by fresh lubricant.

The fact that the cars you mention managed to complete the day's run with their oilers out of commission is not proof conclusive that they could be run indefinitely without the force-feed oilers with which they are equipped. Practically

every car, regardless of the elaborateness of its oiling equipment, depends in greater or less measure on splash lubrication. The object of the oilers is to maintain the level of the oil in the crankcase and to insure the delivery of a supply of oil at points not ordinarily reached by the splash, or not covered as positively as the force-feed oiler can do it. The latter takes the place of the gravity feed arrangement described above, and force-feed types of oilers have supplanted gravity principally on account of their certainty and reliability. But there must be a certain amount of oil present in the crankcase before there is any splash, and in some cars this is quite a quantity, on which they are able to run for some time without renewing the supply. A description of a circulating system such as we mention was published in THE AUTOMOBILE of June 11, page 810.

A CHANCE FOR SOME PROGRESSIVE FIRMS.

Editor THE AUTOMOBILE:

[1,496.]—I have been very much interested in the articles on "Autogenous Welding" in "The Automobile" and can realize fully the great value of this process in making difficult repairs which any motorist is liable to be in need of, and hope you can give us more information in the way of "Cost of Autogenous Welding Equipment, Upkeep, Practice, and Skill" required to do good work, and, if possible, I hope you may induce a few firms doing this kind of welding to advertise regulary in "The Automobile," and thus enable any of us who may be in need to know at once where we can get such work done promptly and well. C. AVERY.

Pleasant Lake, Ind.

There are already two or three firms who are making a specialty of automobile repairs by means of this process and some of the work that they have accomplished is certainly eye-opening. In one case that was called to our attention recently a piece had been blown out of the interior of the combustion chamber of one of the cylinders of a four-cylinder motor. Under ordinary circumstances, there would have been no possible alternative but to scrap the twin-cylinder casting and supply a new one—rather an expensive repair. With the aid of a cutting burner, however, a piece was cut out of the jacket over the place where the injury had resulted to the combustion chamber of the cylinder. The piece that had been blown out was fished out of the jacket, cleaned up and welded back into place. The piece that had been cut out of the jacket to gain access to the repair was then welded back into place and the job was complete: time, considerably less than would have been required to dismantle the motor, remove the defective casting and replace it with a new one, as the work could be done without the necessity of taking the motor down. However, it is usually customary to remove such a part as a cylinder, as it is considered better to preheat such a large piece before welding it in order to avoid setting up internal strains in the metal, which might be the cause of trouble later.

Referring to your query as to information concerning the cost, equipment, upkeep, practice and skill required in autogenous welding, we will have to request the firms that are making and using the apparatus to come to our aid. It must also be borne in mind that the process is of comparatively recent origin and its advantages are not generally known. When they are, a great many breaks that now mean expensive replacements will be made good for very little and there will be few, if any, hopeless jobs. The suggestion that firms who are doing this work should make the fact known to the body of automobilists at large is one that, if followed, should result to the benefit of all concerned.

MISFORTUNES WITH A NEW RUNABOUT.

Editor THE AUTOMOBILE:

[1,497.]—I am an interested reader of "The Automobile," and especially of the Letters Interesting and Instructive department. I would like to have you advise through it regarding my Buick four-cylinder runabout, Model X. This car was purchased June 1, 1908, and has given me a great deal of trouble through faulty ignition. Two cylinders leak compression badly at all times, and I have had to have the valves ground three times in running 600 miles. I am using a good grade of lubricating oil—one that is recommended by the company, but the oil will work up and cover the spark plugs in 10 miles of travel. A few days ago I withdrew the oil from the crankcase and injected coal oil into each cylinder. I found that the coal oil leaked past the piston rings and into the crankcase in the cylinders, in which the compression was weak.

Do you think I could remedy this trouble by putting on new piston rings, or is it probable that after a few months' running the rings will expand enough to stop the loss of compression? If I put in new rings, will it be necessary to have them ground in the cylinder to make them fit? X. Y. Z.

New Salem, Ind.

There is apparently no cure for this loss of compression except the fitting of new rings, and if there is such a difference between the two pairs of cylinders, it might be found advisable to do this to all four cylinders while the engine is dismantled for the purpose, in order to make the compression in all four as nearly uniform as possible. Where a cylinder continues to leak in spite of the lubricating oil, new rings are about the only remedy, unless it is found on taking the engine down that the failure of the rings to act is not caused by any fault of the rings themselves but is due to carbon having got beneath them. If an examination shows this not to be the case, put in a new set of rings on each cylinder, and we should think that if the circumstances were explained to the maker of the car he would be glad to furnish such a replacement gratis, as an engine should never show such a defect after a few months' running. The mileage you state is hardly more than a good running-in trial; the engine should only have about found itself at the end of that time, instead of giving the trouble you complain of. It is not absolutely necessary to run the new rings in to the cylinder, but where this can be done it is preferable. After reassembling the engine, with the exception of the valves, flood the crankcase with oil and belt to some source of power, such as an electric motor or another automobile engine. Run at a comparatively slow speed for several hours and then finish assembling. If this cannot be done, assemble the engine for running, and have it turn over at a moderate speed without too much load, meanwhile using a liberal quantity of oil. In fact, it will be found advisable to use plenty of oil for the first few weeks, until the rings accommodate themselves to the cylinder. With good tight rings and the proper quantity of lubricating the trouble with the spark plugs should disappear.

IS THERE ANY BOOK OF CURRENT STYLES?

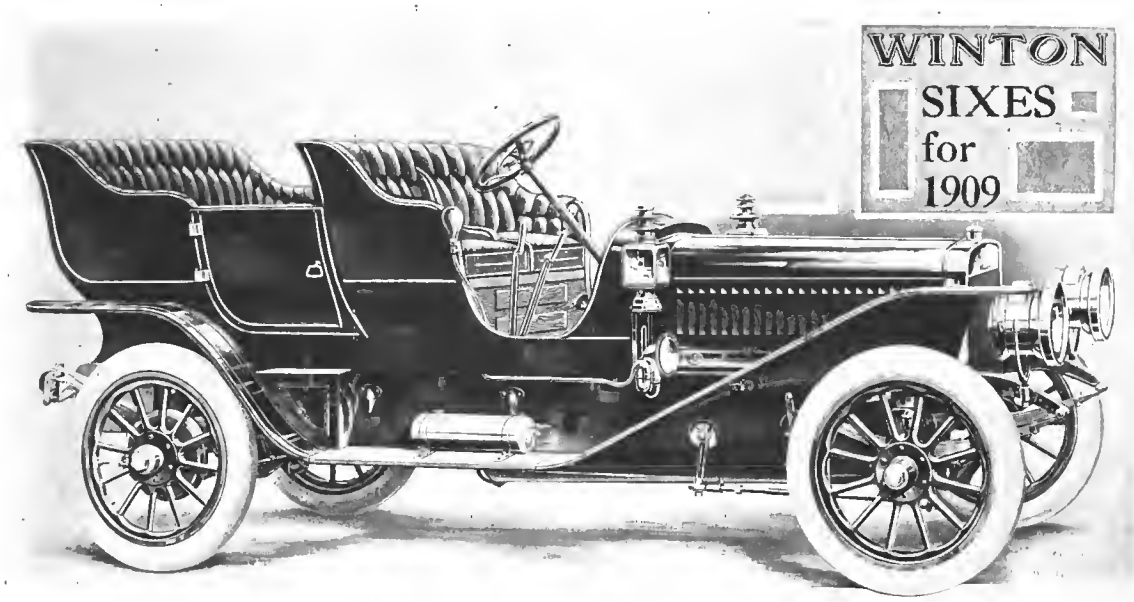
Editor THE AUTOMOBILE.

[1,498.]—I wrote you a letter a few days ago asking if you knew of any book that has been published recently and was advertised in "The Automobile," telling how to tell all the different automobiles from each other, which sold for fifty cents. Is there any machine made, either buggyabout or a standard model, using a two-cycle motor, friction drive and air cooled? GEORGE BRIGGS.

Bournedale, Mass.

So far as we know, no book of this kind has been published, at any price. The nearest thing to it would be the annual handbooks of the manufacturers' associations, the Association of Licensed Automobile Manufacturers and the American Motor Car Manufacturers' Association, both of which publish books illustrating and detailing the specifications of the current models of their makers. The address of the former is 7 East Forty-second street, and the latter, 29 West Forty-second street. We understand that both associations supply these books to prospective purchasers on request and free of any charge. Of course, there are a number of makers who are not members of either association.

The car that comes closest to your specifications, and the only one of the kind that we can call to mind at the moment, is the Duryea buggyaut. This has a two-cylinder, two-cycle, air-cooled motor and a type of friction drive that is novel. There may be other cars that fall more or less closely within your requirements as set forth, but we do not recall them, and probably some of our readers will come to our assistance, as it is getting pretty difficult to keep them all in mind, particularly as so many come on the scene only to disappear within a comparatively short time.

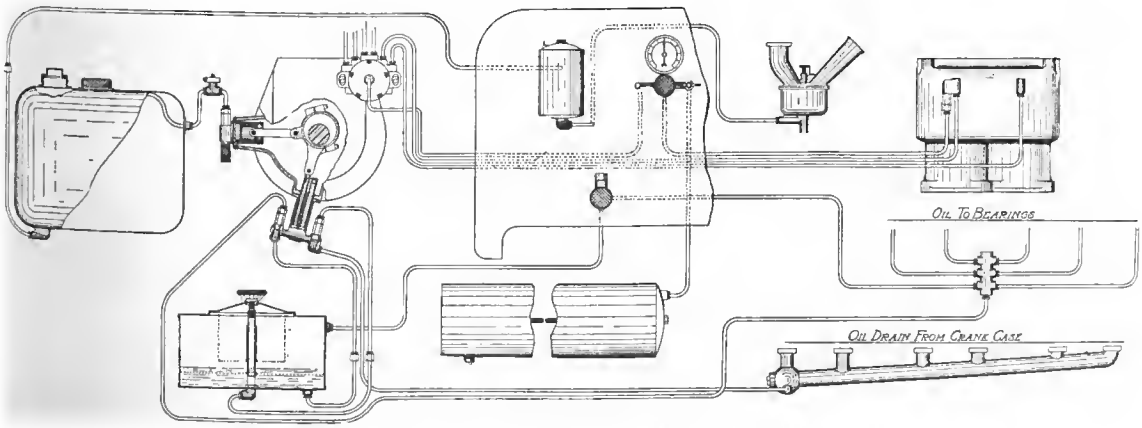


One of the Successors of the Winton Six-Teen-Six for 1908, to List at $3,000.

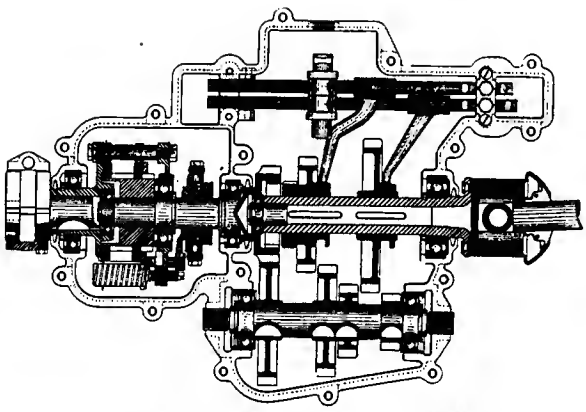
FOR the season of 1909, there will be two Winton six-cylinder cars in the field, in accordance with the previously outlined policy of the Winton Motor Carriage Company, Cleveland, O., to restrict its output to cars of that type exclusively. Both will be known as "Winton sixes," and their only practical difference will be that of size, the smaller, which is to list $3,000, being a 48.6-horsepower car, according to the A. L. A. M. rating, and is a continuation of the Winton Six-Teen-Six that was accorded such a favorable reception this year, while the larger is a seven-passenger, 60-horsepower car, which will be characterized throughout by practically the same features of design. One of its chief differences will be the use of a four-speed selective change-speed gear.

In both motors the cylinders are cast in pairs and are slightly offset from the center line of the crankhaft, in order to reduce the side thrust on the cylinder walls. The valves are all placed on the same side and operated from a common camshaft, the valves themselves being of the two-piece type of large size for the bore of the cylinder, and all are made interchangeable. The plan of enclosing the valve-operating mechanism in chambers on the side of the cylinders, and which are completely sealed by easily removable covers, met with instant success at the time the Winton Six-Teen-Six made its début, and has accordingly been followed on both models, so that with the single exception of the flywheel, there is not a working part of the motor that is exposed in any manner. The self-starting device has also been perpetuated as a part of the regular equipment of both the Winton motors for 1909. It is continued without any change and consists of a method of taking compressed air from the forward cylinder of the motor and storing it in a pressure tank. From the latter, it is distributed by means of a rotary valve to the different cylinders in the order of their firing. The motor can, in consequence, be started merely by depressing a foot button on the toe board, the air pressure running the motor as if it were a compressed air engine until it takes up its own cycle automatically, when the button is released and the air shut off. The starting device does not interfere in any way with the other functions of the motor, so that as soon as the latter moves under the impulse of the compressed air, charges are drawn in and fired and the motor runs under its own power. There is but one moving part, the rotary valve, so that the device as a whole is extremely simple and effective. In one of the appended diagrams, the connections of the self-starting device, as well as those of the gasoline and oil supply lines are shown clearly.

The tank at the extreme left is for the main supply of gaso-



Showing the Relative Positions of the Self-starter, Oil and Gasoline Lines.



Clutch and Gear-set of the Small Winton Six.

line, while immediately at the right is the air pump, operated by an eccentric, which also operates the two pumps for the lubricating oil feed. The oil tank is shown immediately below the oil pumps, while at the right hand of the air pump is shown the air distributor for the self starter. On the right of the oil tank appears the air pressure reservoir with a line leading to the foot button and pressure gauge on the dash. The small tank shown on the dash is the auxiliary gasoline tank, the carbureter being shown at the right, as well as two cylinders of the engine. From the first cylinder two pipes lead; one of these is to conduct the air pressure from the cylinder to the storage tank and the other is similar to the feed pipes leading to each of the six cylinders to distribute air to them from the pressure tank through the rotary valve. The oil leads to the bearings and the oil drain from the crankcase are shown at the lower right-hand side, illustrating the circulation of lubricant.

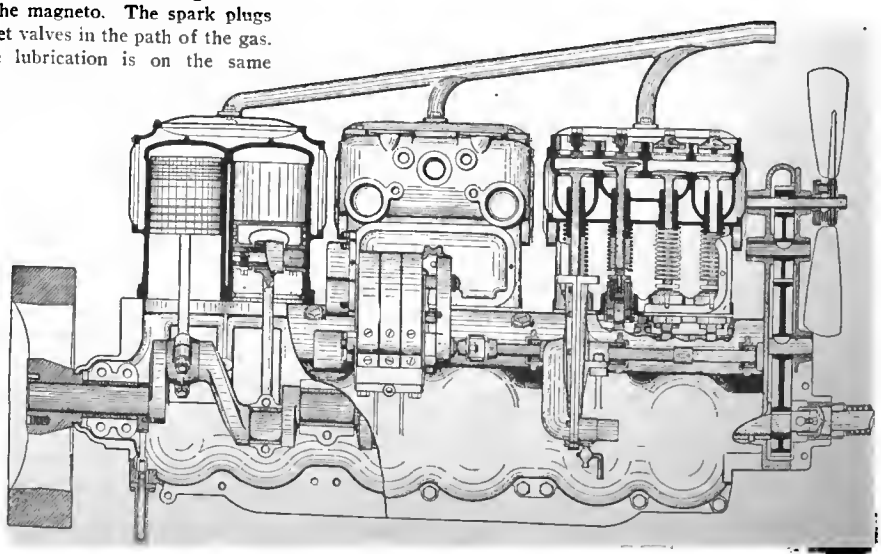
The carbureter is of the Winton type, having two nozzles and two throttles and operating progressively, the smaller opening first and the latter automatically picking up the larger one. The float chamber is placed concentric with the nozzle, thus maintaining a positive feed regardless of the grade. The carbureter is of the automatic compensating type, although it has no moving parts, and is placed on the side of the motor opposite the valves. A double system of ignition is employed, the Eisemann high-tension magneto being employed for the running side and constant service, while a set of accumulators is added to facilitate starting, their current being utilized through the single non-vibrating coil and distributor of the magneto. The spark plugs are placed horizontally over the inlet valves in the path of the gas.

On the 60-horsepower car the lubrication is on the same principle as on the Winton Six-Teen-Six, except that it has been considerably simplified by using but one pump, instead of twelve. The single pump is operated by an eccentric on the rear end of the crankshaft, taking oil from a tank at the left side of the motor and delivering it through the oil feeds to the crankshaft main bearings and forward gears. A second pump draws oil from the crankcase where it is deposited by gravity, and returns it to the oil tank above, where it is expelled to pass through a fine screen before being used again. There is a sight test on the dash to show the working of the system.

The cylinders are oiled by splash, while the clutch and gear-set run in an oil bath. A gear-driven centrifugal pump circulates the cooling water to and from the Winton type radiator.

A multiple disc clutch composed of 67 relatively small, steel friction surfaces constitutes the first step in the transmission of the power. Of these surfaces 33 are attached to the transmission shaft and 34 to the driving spiders, which are in turn connected with the flywheel, thus following the principle that the parts having the least inertia should be attached to the member having a variable velocity. Six springs placed at equal distances round the clutch distribute the pressure equally on all the discs, and they have been designed so as to be easily removable. The clutch and hand brake are interconnected and the clutch pedal cannot be locked out of engagement, except by the emergency brake. A selective sliding gear-set supported on annular ball bearings forms the next step in the transmission. The gears are of specially hardened alloy steel, and the set provides a direct drive on the third speed through an internal and external gear combination. By means of a safety device the gears may always be moved into neutral but cannot be shifted from one speed to another without disengaging the clutch.

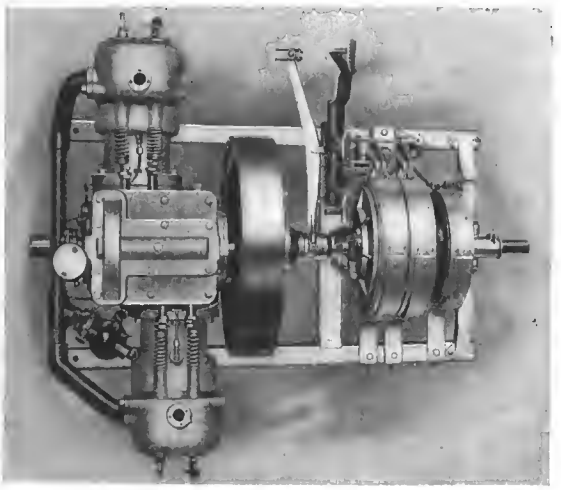
Final drive is by shaft with roller type universal couplings enclosed in grease-tight metallic cases. The flexible coupling between the motor and gear-set consists of a split housing engaging the square end of the main shaft of the gear-set, and a similar steel square bolted to the flywheel. Timken roller bearings are employed on the pinion shaft. The rear axle is of the floating car and carries no load, the weight of the car being supported entirely by the heavy drawn steel housing which surrounds the axle. A spur type of differential is employed and special Timken roller bearings are used throughout. The front axle is a one-piece I-beam casting of manganese bronze, as has been the case for several years, and this is also true of the Winton twin-spring suspension, shock absorbers having been added as a part of the regular equipment of the car. Brakes are of the usual internal expanding and external contracting types and are located in drums on the driving wheels, both sets acting through equalizers. A screw and nut steering mechanism with ball thrust bearings is employed, with a Lemoine type front steer, the steering links being adjustable, while the joints of all steering connections consist of a heavy bolt with a bushing, held secure by a nut and a large cotter pin. The wheels of the smaller car are 34-inch, while those of the 60-horsepower six-cylinder Winton are 36-inch, the wheels running on standard Timken roller bearings while the standard tire equipment in both cases consists of 4 1-2-inch Goodrich quick detachables.



Working Side of the 48.6-horsepower Motor of the Smaller Winton.

FEATURES OF THE GRABOWSKY TRUCK.

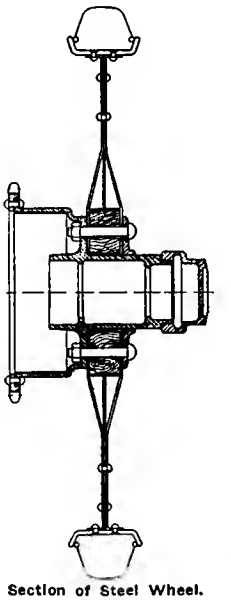
Several noteworthy features appear in the new trucks and commercial vehicles manufactured by the Grabowsky Power Wagon Company, of Detroit. They are the work of Max H. Grabowsky, formerly designer for the Rapid Motor Vehicle Company, now manager and designer for the company which bears his name. The company is at present turning out 1 and 1 1-2-ton chassis fitted with various types of bodies, for use as delivery wagons, passengers and sight-seeing cars, and for all kinds of municipal service, such as ambulances, patrol wagons, etc.



Plan View of Engine and Planetary Gear.

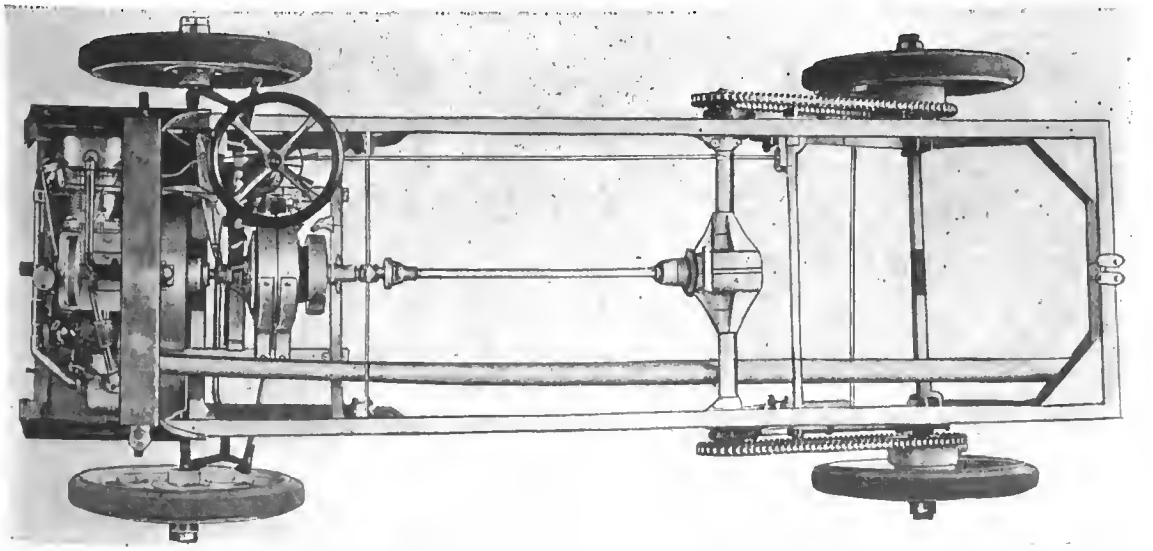
Perhaps the most striking innovation for such a comparatively light vehicle is the use of solid pressed steel wheels; these have many advantages for this service, being practically unbreakable, easy to keep clean, and at the same time cheaper than the ordinary wood-spoked wheels. The engine, of the two-cylinder horizontal opposed type, is placed at the front end of the car, and drives through bevel gears to a jack shaft, thence by chains to the rear wheels. The cylinders are 5 1-4 by 5 inches. The crankcase is cast of special grade iron, heavily ribbed. The crankshaft is a chrome-nickel steel drop-forging, 1 7-8 inches in diameter, with bearings of Parsons' white bronze. A standard ignition system is used, with storage batteries and coil in a special compartment under the front seat; the timer is carried on a vertical shaft in front of the engine, as shown by the photo; the lower end of this shaft drives the oil pump.

The engine is cooled by a thermo-syphon system which bears a strong resemblance to the steam-generating system used on several French cars about 1900. The radiator is constructed with a condensing tank four inches above the intake chamber; the water, returning from the engine in a steaming condition, rises through the tubes, collects in the condensing tank at the top, and then runs down to the main tank, from which it flows back to the cylinders. The position of the radiator, above and to the rear of the engine, allows easy access to the latter. When the hood is lifted the working parts are as ready to hand as if laid out on a workbench. A two-speed and reverse planetary gear is used, with friction bands of spring steel lined with a composition of asbestos and copper. The entire power plant and transmission is carried on a separate subframe, and by removing two bolts and breaking six quick detachable connections, can be lifted from the car intact. If such a thing should ever be necessary, it would be the work of but a few minutes to put in a complete new engine and gear.



Section of Steel Wheel.

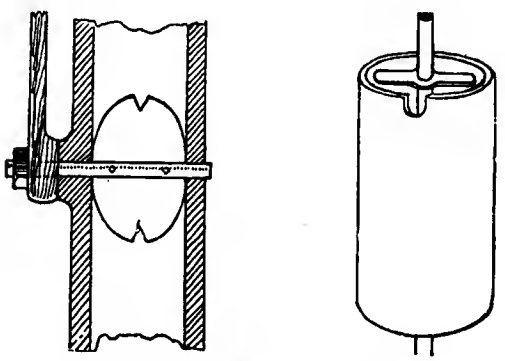
Both front and rear axles are constructed of the same material and dimensions, being of a special axle steel 1 1-2 x 2 3-4-inch section; the steering yokes have a six-inch spread. As stated above, the wheels are pressed steel, unless wooden wheels are specified by the purchaser, and are shod with solid endless side-wire tires. The frame is of extra-heavy channel section pressed steel, mounted on semi-elliptic springs in front and full platform springs in rear. The brake system consists of two internally expanding bands on the rear hubs, controlled by a pedal, and an emergency brake located on the drive shaft. There are no projections on the frame back of the steering column and controlling levers, so that the bodies may be easily slid on and off.



Plan View of Grabowsky Chassis, Showing Position of Radiator and General Layout.

PROPER ADJUSTMENT OF THE CAR'S ESSENTIALS

THE throttle valves in some carbureters are so designed and arranged that when they are almost closed a movement of the lever a single notch will stall or race the engine. This is bad enough if the steering column is perfectly stiff and the throttle movements are perfectly positive. If the steering column is springy the chances are the throttle movement is no longer positive, and one may stall or race the engine without shifting the lever at all, simply by pushing or pulling on the steering wheel



Curing Throttle Valve Trouble in an Old Car.

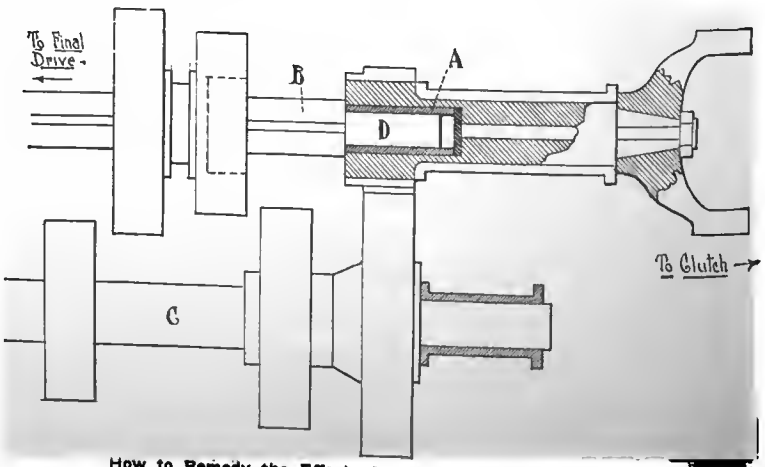
or by turning it in one direction or the other. When the throttle is well open the effect of this is imperceptible, but when the car is being maneuvered in limited quarters, as, for instance, on a garage floor, the fault is extremely annoying and may lead to accidents. The treatment will depend on the character of the throttle valve. If it is of the sliding or piston type, it is very easy to file a notch or slot in the edge of the valve, which will be opened by the first movement from tight shut, and will permit sufficient gas to pass to run the engine slowly with the clutch released. If this slot can be made fairly deep in proportion to its width the lever can be moved several notches without seriously affecting the speed of the engine. If the throttle valve is of the butterfly type the solution is not quite so easy. Fortunately, if this type of valve closes square across the pipe its first movement is fairly gradual. If the car owner has a carbureter with an elliptical butterfly throttle valve he will probably do best to take his choice between having the valve close tightly in its extreme position and having it close so that the motor will just run itself when idle. If he chooses the former alternative he will have difficulty in making his engine run quietly on a slight opening of the throttle. If, however, he chooses the second alternative, he can secure quiet running of the motor when idle by filing a notch in one edge of the valve as shown in the sketch and arranging his connection to the spark lever so that the slight amount of movement permitted by the spring of the steering column will not open the throttle.

Alignment of Loose Gearshaft Bearings.

Although in theory all gearshafts should be perfectly lined up, perfectly straight, and a perfect fit in their bearings, it must be admitted that in practice these three conditions are seldom fulfilled; and the practical question is, "What limits of error can be tolerated?" Obviously, a categorical answer cannot be given; so much depends on the width of the gears, length and stiffness of the shafts, length of the bearings and other variables. Gears with wide faces and small teeth require to be more accurately lined up than gears having narrow faces and large teeth. If either type of gear can be kept perfectly in line, so that its teeth have a bearing clear across their faces, it will wear much more slowly than if the teeth bear only across a portion of their faces. If the shafts are sprung, which may not impossibly be the case, the gears are much worse off than if the shafts are simply out of line, and the bearings also are worse off, since they will tend to wear oval, hour-glass shape, or otherwise, according to the particular kink in the shaft. When the drive is direct on third or fourth speed, usually the forward end of the squared shaft is reduced in diameter and enters a solid bushing A in the first spur pinion at the front end of the bear box. See the sketch.

Taking Up Movement in the Bearing.

When this bushing wears out, or when the shaft B springs and has to be straightened and trued by grinding, there is no way of taking up the bushing, and if it is several thousandths large for the shaft the natural tendency of the latter will be to slant away from the secondary shaft C as far as the bushing will permit, and thereby have a bearing in the bushing only at its front end until the bushing has worn conical at that end. Under these conditions, the shock of suddenly engaging the clutch might bend the squared shaft at D, where its front journal joins the square. To avoid this possibility the bearings of the first spur pinion may be scraped slightly sidewise toward the secondary shaft, to approximately half the amount of the difference in diameter between the bushing and the shaft entering it. This will enable the bushing to give a bearing to the journal clear up to the squared part of the shaft. Unless this expedient is resorted to it is not safe to tolerate a greater difference in diameter between the journal and the bushing than five to eight thousandths of an inch. It is obvious that the same device of scraping slightly to one side or the other may be resorted to in other places, to bring shafts in line or to compensate for small degrees of wear in the bearings. For example, the after bearing of the squared shaft could be scraped away from the secondary shaft under the circumstances above mentioned. If the car has side chain drive, the bevel gears may be brought square with each other by scraping the two cross bearings in the same way. Timely attention to defects such as those mentioned is usually all that determines whether a car can he said to be in good condition at the end of a year or two of service, or the reverse, for neglect of ills apparently trivial in themselves not only permits them to assume aggravated proportions, but also leads to others that are frequently of a far more serious nature.



How to Remedy the Effect of a Sprung or Disaligned Shaft.

PRESENT STATUS OF AMERICAN MOTOR VEHICLE LAWS

At the recent Buffalo Good Roads and Legislative Convention of the American Automobile Association, Chairman Charles Thaddeus Terry of the legislative board made a most comprehensive address, in which he made clear the present status of motor vehicle laws throughout the country. To the many who were unable to attend the convention his address will prove most interesting, and it is herewith reproduced:

Mr. President, Guests of the Association and Fellow-Members:—Our heartiest congratulations are due to the officers of the American Automobile Association, to its committees in charge of the convention, and to the individual members of the organization, upon the wisdom and foresight which conceived, and the intelligent industry and untiring zeel which have brought to so successful a consummation, the ideas embodied in this netional convention.

This is an epoch-making occasion. It is the most signal end significant event which has happened in the history of automobiling in this country. Its influence has alreedy been widely felt, and will be still more widely felt, to the lasting advantage of the industry and the sport in the daya to come. The deepest gratitude should be entertained by the user of motor vehicles in every State in this country to the American Automobile Association which has made such a convention as this possible and successful, and most of all is gretitude due, for his indomitable energy and unremitting labor, to that man who has spent his deys and nights, in season and out of season, for the upbuilding of this organization, in self-denying devotion to the interests of automobilists—our president, William H. Hotchkiss.

If this convention does not result in a vast improvement in the roads over which end the laws under which the automobilists may travel, it will be because the individual automobilista do not avail themselves of the magnificent opportunity which this occasion affords for stimulus, for knowledge of actuel conditions, for education, looking to the betterment of those conditiona and for an ecquisition of ideas which may be put into operation and worked out in concrete form in the several particular locailties where our individual members may happen to reside. The thoughts advanced snd the plans evolved at this assemblage muat be put into immediate operetion and application, else the value of this occasion will be utterly lost. A thought not converted into action is dead. It lies with you to see to it that the force set in motion on these two days shall be unending in its influence for good.

Good roeds and feir lews! But the more important of these is fair laws. Without fair laws, good roads ere of no use to the automobilist.

You might have throughout the country a system of roads surpassing anything yet devised by man, and, nevertheless, if stone walls were built ecross them every twenty-five miles, they would be useless as means of intercommunication. Barriers almost as effective es such stone walls have been erected at the confines end within the confines of various States throughout the Union by the enactment of laws which make an attempted use of the highways of the country so difficult and expensive ae to amount practicelly to a prohibition.

There are meny netural end inevitable obstructione to the automobile in the use of the highway. There are animals of every nature end description which wander about on the roada and make their passage dangerous, but, of all the creatures which infest the paths of travel the most obnoxious and the most unreasonable by fer, to the automobilist, is man, particularly when he is brought together in combination with other men in bodies called legislatures. How much has been done by lawmaking bodies to destroy the netural privileges of users of highways is realized by those who have attempted to use the motor car in interstate travel, but even to them the extent of the attempt, on the part of legislators, to erect this natural right to use the highways into an expensive privilege is not thoroughly understood, nor would it be generally believed, unless the detailed facts were presented to them in succinct form.

As a premise for the deliberations of this session, I present in brief outline the situation, as regards motor-vehicle legislation, ae it is at present.

Present Status of Motor Vehicle Laws.

The condition in which we find the motor vehicle laws of the various States of the nation at this time is both intolerable and ridiculous. Intolerable, beceuse it retards the progress and development of tbe automobile and greatly lessens its usefulneas. Ridiculous, because it is hard to conceive how, within the confines of one nation, so many legislative bodies, supposedly made up of the leading men of the commonwealtha, could enact provisions of law on the same subject so divergent and contradictory, and at the same time absolutely without apparent purpose, except to harass and restrict a certain class of citizens.

In thirty-one States of the nation, registration of motor vehicles is required, nearly every requirement being different from the other, the fees ranging from 25 cents to an annual fee of $25, and the authoritiee being in most instances the Secretary of State, and in some the State Boiler Inspector.

In aix States, local authorities may each require registration and licenaes in their particular locality.

In ten States, a license to operate, in addition to registration, is required, with annuel fees ranging from $1 to $3.

In eight States, the registration and license laws of the other States are entirely disregarded, and non-residents passing through are agaia required to register their vehicles, pass an examination aa to the competence to operate, and procure a license.

In four States, non-residents, exempt from the registration provisions of State laws, are not exempt from the registration end license requirements, enected by local authorities.

In seven States, non-residents are exempt for periods of time, ranging from twenty-four hours to sixty days.

The most striking illustration of the ridiculous and intolerable State enactments affecting non-resident automobilists ia to be found in the Eastern States.

An automobilist, desiring to go from New York to Waehington in a 30-horsepower vehicle, in eddition to registering and paying the fees in the State of his residence, must register his vehicle and procure a license to operate in the various States through which he must pess.

In the State of New Jersey, he must register his vehicle and pay a fee of $10, give to the Secretary of State power ef attorney to accept service of process for him, pass an examination, procure a license to operate, and pay an additional fee of $4.

In Pennsylvania he must again register his vehicle and pay a fee of $3, pass en examination, and procure a license to operate.

In Maryland, the same process must be repeated, with a fee of $3.

On arriving in the District of Columbia, he must register his name and address with the Automobile Board within 24 hours.

Such a state of affairs needs no characterization.

In matters of speed and rules of the roed, the automobilist is not only harassed by divergent and contradictory State laws, but in most States he is subject to restrictions imposed by local authoritiea of every political and governmental division of each particular State. The speed limitations range from four to twenty miles an hour, changing according to the locality, and the automobilist, without the slightest negligence or danger to other users of the highway, mey violate the speed laws six or eight times in a run of sixty miles.

The speeds allowed at intersections, crossings, bridges, and curves, range from four to six miles an hour; in cities and towns and built-up sections eight to ten miles an hour.

In seventeen States, as in New York, the maximum of speed allowed is twenty miles an hour, with limitations, ten miles in closely built-up sections of a city or village, fifteen miles in other portions thereof, and four miles on curves, bridges, and steep descents, varying in different States.

In six States, twenty-four miles an hour is the meximum.

In six States, fifteen miles an hour.

In one State, twelve miles an hour.

In one State, eighteen miles en hour.

In one State, eight miles an hour.

In one State, a reasonable and proper rate.

Only Two States Have Sane Laws.

There are only two States at the present time which have reasonable or sensible speed limitation provisions in their motor vehicle laws, and they are the States of Connecticut and Florida, which require that the rate of speed should be reasonable and proper, the effect of the Connecticut provision being partially destroyed by the maximum limitation of twenty-five miles. The other Statea have enactments which cannot be enforced or which make comfortable motor vehicle travel quite impossible.

It will be seen that if the motor vehicle is to take its proper place as a means of general travel and interstate communication, this intolerable condition must be changed and some basis of uniformity in legislation arrived at. An automobile is a power and force extending national development and automobilists should not suffer its usefulness to be restricted by laws enacted, not for the protection of the people of the State, but, as in New Jeraey, for the sole purpose of manufacturing an additional source of revenue. This condition will last only so long as the automobilists themselves acquiesce.

I have said that of all the creatures which infest the highways and make use of automobiles disagreeable or inconvenient or next

to impossible, men are the worst. Cows and horses and pigs and chickens are bad enough, but men are worse. A cow can only be slow and stupid—like a cow; a pig can only be a menace by making you think he is going to run into your way when he nevsr does—like a pig; a horss can only become needlessly frenzied with fear and break his harness and injurs everyone in his immediate neighborhood—just like a horse; a hen can only be the rattle-brained thing sbe is, and insist on showing how dangerous a motor vehicle is, by throwing herself in front of it and getting herself killed—like a hen; but, unhappily, men in some instances are all of these creatures together—sometimes they are in automobiles; sometimes they are walking or driving horses on ths highway; and—sometimes they are sitting in legislatures.

Provincialism Rampant in State Legislatures.

The present motor vehicle laws are ths last, best demonstration of the provincialism of several of our States. They are the masterpieces of men of so narrow an outlook that they cannot see that anyone lives behind the mountains which confine their hamlet, their county, or their own commonwealth. Those legislatures which ensct motor vehicle laws destructive of ths rights of the residents of other States to engage in interstate travel hide behind tbe high-sounding phrase, "States' rights," which, it will be observed, is utterly meaningless in this connection. Such laws spring not at all from an observation of States' rights, but entirely from a narrow provincialism which refuses to consider the rights of sister States.

And let us not be deceived by the cry of these legislators that the hostils automobils legislation which they enact is demanded by that much-abused class called "farmers." There is not a word of truth in it. No one who has given thought to the situation, has found the "farmer" anything but open-minded, reasonable, fair and ready to be instructed as to the facts and persuaded as to the natural conclusions to be drawn from tham. No, the trouble lies not with the farmers. It lies rather with the cheap politician, the demagogue, who is ever ready to make capital out of the nearest available matarial, and who, whether he asserts it in so many words or not, acts upon the assumption that he is the common people, the sovereign "who controls the roads, the deputies, and the future of political parties." Ha it is, and not tbe farmer, who instigates the enactment of these stupid, senseless laws. Of course, one does find from tima to time in every community, whether it is the city or the country, individuals who, because of some real or fancied indignity at the hands of an automobilist, arc ready to curss progress and sclence and everything and svarybody, and to rush to his senator and assemblyman and demand that the automobile be driven from the highways. But such incidents have become, in this day, not tha rule but the exception. Whatever may have been trus in former days, it is no longer true that bad automobile laws come by any popular demand. They are born of the imsginings of some one or more legislators, often for a political purpose.

Take, for example, New Jersey. Its automobile policy is as narrow as the geographical confines of the State itself compared with other States. It has the most unreasonable and unfair automobila law of any State in the Union, and it came, and exists, not bscause of any desire on the part of the people of the State, but as a necessary adjunct to the political aspirations of a single individual in the legisature.

Some Bad Laws Due to Misconception.

It is amazing how far behind the times many legislators have fallen. Their failure in msny instances to enact reasonable, sane, and effective automobile laws, has been due to a misconception of the present status of the motor car under modern conditions. Their error goes to the root of tha matter. They have utterly failed to observe that the automobile is no longer a mere instrument of sport, which may be carelessly treated as of no particular moment; which may be legislated off the highways if its use proves disagreeable to some narrow-mindsd peopla. They have not noted tha tremendous extent of its use, nor the varied purposes which it serves—in short, they have not opened their eyes to the fact that it has become an important factor in ths commerce of our country, and that in ten years it will becoma the most important vehicle of trads and transportation. It is no longer a mere luxury—it is a necessity. It performs all the functions of the horse and vastly more. In important respects, it will be superior to the railroad as a means of interstate communication and interstate trade, because, while the rsilroad is confined to the narrow limits of two stael rails and straight lines of travel and infrequent stopping places, the motor car reaches to the most remote corner, is confined to no particular line of travel, and can stop when its driver pleases.

As the advent of the railroad train absolved the traveler from dependence on the post chaiss and the stage coach, so the development of the motor vehicle will free him from the discomforts and inconveniences of the time-tabisd railroad.

It ia thus seen how unwise, how short-sighted, and how puerile it is for legislators to supposa that they may, at will, restrict and limit and needlessly embarrass the widespreading usa of this vehicle. It is irresistible progress against which they are pitting their puny strength. They are securing for themselves only ignominy and ultimate defeat, which is not now so far in the future.

The use of motor cars has only just begun. The science of their manufacture has not yet reached its maturity. The numbers of them in use will be multiplied year by year, until the horse will disappear—except as it is used for sport or pleasure—and be ss rare a sight upon our highways as the automobile ten years sgo.

Waks up, legislators! The automobils has gone by you while you were wondering when it would come. You cannot ignore it—neither can you deny it the rigbts which its importance demands.

Appeals to Prejudice No Longer Successful.

There was a time, not so many years ago, when the misdeeds and ths recklessness of the few among automobilists were made tbe basis for the hue and cry sgainst all of the clsss, a cry whicb found its echo in hostile, hateful, vengeful automobile legislstion in many States; but that time is past, and those statutes hsve for the most part been wiped off the statute books. Nowadays, snyone who attempted to make such an appeal to passion and prejudics would be calmly answered by the facts. Experience has shown that the great majority of automobilists are law-abiding, careful users of tbe highways, considerate of the rights of others, snd thst the real reason why there still exist a few who wlifully disregard the law and tbe decencies of the highway is, not because the highway laws were not right, but because the authorities were slothful in their enforcement of them. The remedy is not in other or different laws, but in ths enforcement of the plain, simple, common highway rules.

To enact laws which impair or destroy the rights of the many, in order to reach and punish the few, is distinctly un-American. It is directly contrary to the basic principle of our jurisprudence, which holds that it ia better that a thousand guilty persons should escape than that one innocent should suffer. Sucb States as the State of New Jersey have reversed tbis doctrine and havs framsd their law upon tha dogma that, better a thousand innocent persons shall suffer than that one guilty should escape. The bars statement of this policy carries its own aufficient condemnation.

Highways Are National.

For all purposes of interstate travel highways belong to the citizens of the United States, with the absolute right to travel thereon and to make ingress and egress from ths various States, unhampered by the narrow restrictions sought to be imposed by provincial enactment. The various and varying motor vehicls laws of the forty-five different States of the Union, oftentimes characterized by unreasonable, harsh, unnecessary and galling limitations, would, if they were persisted in, put an end to the uss of tlie automobile.

It would seem that, if we are really a nation, such a state of things would be impossible, as it is intolarable. The remedy lies in either one or both of two directions: Either, first, tbs enactment of a simple, uniform motor vehicle law in all of the States; or, second, the enactment of a Federal statute which will be controlling in all parts of the country. The remedy, will be administered; the reform, it la coming—indaed, it has, to a large extent, already come. Several of the States have at the last or previous sessions of their legislatures substantially enacted the uniform motor vehicle law proposed by this association. Look at the law of Connecticut, at the law of Rhoda Island, and at the law of Ohio.

The Federal Law.

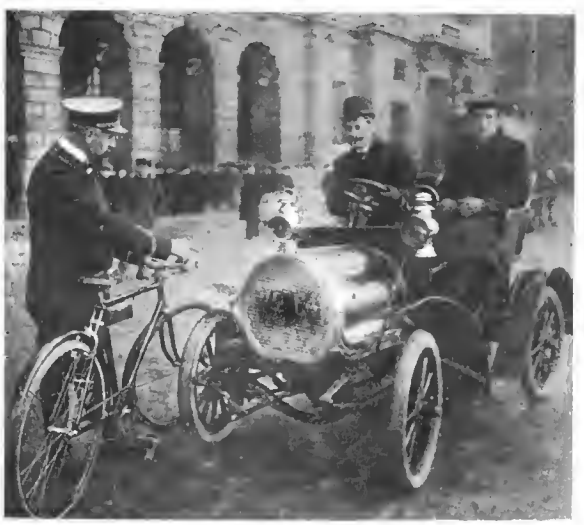
The Federal Automobile Registration bill, drafted and pressnted to Congress by this association, will become the law of the land. There is not the slightest question of it. It is recognized to be right and expedient by everybody, and no one, who has given the subject ndequate study, and whoss mind works clearly, denies the constitutionailty of the measure. If a man may walk or drivs, or sail in his steam yacht, through various States without being retarded and rastricted at the boundary line of each State by registration and license laws, why may he not likewise travel througb the various States in a motor vehicla? If it be said in answer that tho residents of the Stata require his identification for their own safety, the snswer is that the registration of tha motor vehicle under this Federal law will suffice, as it has always done in the case of steam and sailing vessels whila using the waterways of the nation. Under this bill, the only restriction upon the various States is that they shall not retard and impede motor vehicles engaged in interstate travel by useless and unnecessary registration and license requirements.

Gentlemen, the worst of tbe battls is over. The common sense of our people is again asserting itself, even to the confusion of some legislators wbo do not wish to be convinced. The Uniform State Motor Vehicla Law is on the way and at no vsry distant dats will be an accomplished fact. The Federal Automobile Registration Law, when it has been set upon the statute books, as it inevitably will be, will prove to automobilists tbe boon which it was intended to be, and will answer the criticisms of tbe last doubting obstructionist. In short, a better, brighter day is dawning in automobile legislation in all the world—and Naw Jersey.

TOURING AND PETTY PERSECUTION IN FRANCE

PARIS, July 30.—It is a period of contradictions in France just now, the country treating automobilists on the one hand with a generosity and largeness of view altogether without precedent, and on the other subjecting them to a series of petty annoyances always dangerous from their ability to develop into organized persecution. It is a sign of the times that the Minister of Public Works should take the initiative in calling an international conference to discuss new methods in road building and traffic control as the result of changed conditions of locomotion, and it is but further proof of the foresight of the same Minister that he should be prepared to spend thousands of dollars for the entire rebuilding of eight roads leading from the capital to all points of the provinces.

But there is a dark side to the picture in the mischievous activity of the police, especially in Paris, and the rampant "Protective Association Against the Excess in Automobiling." Automobilists always have been kept up to a high standard of conduct in the city of Paris, but as Chief of Police Lepine knew his business and took no delight in applying an arbitrary speed law, no one found fault with his regulations against smoky exhausts, the use of sirens and headlights within the city limits. Lately there has been a change for the worse, and instead of attention to the wise recommendation that safety or danger in speed depends not on a fixed rate of travel, but entirely on circumstances and places, there is a tendency in the suburbs to trap cars passing along certain well-traveled roads, whether transgressing legal limits or not.



Arresting Driver for Using a Number That Has Become Worn and Somewhat Weather-beaten.

There is also a nine-year-old regulation which declares that no driver shall leave his car until he has taken all precautions against accidental starting and until he has stopped all noise. All was well until some officious cycling policeman drew up a procès-verbal against the driver of a town vehicle for leaving his engine running while the car was unattended. Within two days half a dozen more were treated in the same manner and a cry of indignation went up. When it was asked in what way the gentle hum of a modern motor could be injurious, the righteously indignant were given a copy of the law to read.

Day in Prison May Be Penalty for Smoky Exhaust.

As a protection for drivers of automobiles, the Association Generale d'Automobile has decided to place a number of private agents on the streets at all important points, to give warning to all those who, intentionally or otherwise, are in danger of falling into the hands of the police. Should the registration numbers be dirty, exhaust smoking, rear light out or in danger of going out, or should the driver keep his headlights lit after passing the city wall, use his siren or show too much speed at dangerous points, the road agent will give him a kindly warning which should enable him to escape an annoying fine or a still more annoying day in prison. Under the new régime a driver of an automobile who has been fined once for any infringement of the law is condemned to twenty-four hours in prison for the second offense, even though it may be the harmless one of emitting too much smoke or driving without a rear light. The wise ones have learned that the only way to escape acquaintance with the inside of a cell is to shun the courthouse as they would the plague, when the first procès-verbal is served. They may be condemned to a fine, but a condemnation in the absence of the accused does not count in the scale which leads to the police cell. It is one of the intricacies of a legal scheme which a layman would not attempt to explain.

Far more dangerous than the petty prosecutions of overzealous police officials is the activity of the Protective Association Against Excess in Automobiling, founded by Colin, one of the best-hated men in France. Public lectures have been held in various parts of the country with a view to stirring up animosity against the automobile, Parliament has been assailed, and a bill proposed by which the automobilist should in every case be morally and financially responsible for every accident in which he may be involved. So active has been the association that leaders of the industry, including the president of the national club, have publicly taken up arms against the movement. Now every anti-auto meeting in the city is attended by an able speaker versed in questions of law, who "heckles" the lecturer when the time for public discussion arrives. One of the manufacturers' associations has entered into the fray by the publication of thousands of posters showing, by a series of pictures, how the poorly paid bicycle mechanic has risen to a comfortable position in life through the automobile industry, and how he will fall back to poverty if the anti-autoists are allowed to pass laws prejudicial to the spread of automobiling, with its numerous benefits.

Some provincial clubs are doing useful work by publishing every month, by means of posters and advertisements in the newspapers, statistics on the number of accidents caused by horses and automobiles. The Sarthe Club has a table which shows that in its department for a period of 76 days there were 50 accidents caused by horses, 9 deaths and 45 persons injured, compared with 3 accidents, no deaths and 3 wounded by automobiles. During the period preceding the Grand Prix, when automobile circulation was intense, there were no fatal accidents in the districts, while the average annual death roll in that district alone from horse accidents was 40 to 50. The figures being sent forth broadcast and backed up by undeniable proof, public opinion cannot but be favorably influenced.

Government Has Big Schemes for Perfecting Touring.

How the authorities are fostering the spread of automobiling is a pleasanter and more interesting story. The development of both commercial and pleasure automobiling will probably in the future be influenced as largely by road conditions as by the efforts of the manufacturers to produce mechanical masterpieces. Other things being equal, the country with the best road system will be the one to reap the greatest reward. At any rate, this was how Minister of Public Works Barthou looked at it when he decided to hold an international road conference this year. The first meeting of the organizing committee has been held in Paris, when the Minister announced that their ob-

ject was to adapt the present road system to new conditions of locomotion and save the highways from the destruction which was bound to follow if methods of an earlier age were applied to conditions of the twentieth century. They had done much in their own country to improve highways, but other nations had not been idle and it was imperative that they should get together and work out, from the fund of common knowledge, the systems which are best suited to new conditions of travel that now obtain so very generally.

Continental Europe is naturally primarily interested in the road conferences, for in addition to improved road surfaces and the suppression of the dust nuisance, they may by unison perfect plans for uniform road regulations and control, which will be of inestimable value as the highways rise to a position rivaling the railroad as arteries of communication. But America and other distant countries should obtain information from the experience of other countries which will be of inestimable value in the building up of her own road system and the remodeling of existing routes. It is especially important that the work of pioneers should be closely watched at a time when the supremacy of macadam appears likely to be lost for roads destined for mechanical traction.

Two Hundred Miles of Granite Paved Road Around Paris.

Discussions on what roads should be do not exhaust the activities of Minister Barthou. As a New Year's gift to automobilists he has promised the construction of eight main roads leading out of Paris to different points in the provinces, to be built on the most scientific plans and be absolutely dustless. As every tourist who has endeavored to enter or leave the French capital is aware, roads radiating from Paris are the worst in the country, the majority of them being built of rough, ill-laid paving stones and the minority consisting of badly-worn macadam. At present there is only one main road out of the capital which can really be regarded as good, the others being in a disgracefully poor condition. A chauffeur acquainted with all the highways and byways of the city reaches the open country by devious routes impossible to the stranger, who falls a victim to the forty-mile belt of pavé.

The eight automobile highways will be existing roads entirely remodeled. There is an excellent example of how this will be done in the Avenue de Neuilly, forming a continuation of the famous Avenue de la Grande Armée. Though laid perfectly straight and of excellent width throughout, automobilists shun this highway into Normandy, for its surface is a villainous pavé which would shake loose every nut on the car and make short work with springs. Consequently the highway which has seen the proud march of armies is now deserted by all but the wheezy steam street railroad and an occasional cyclist who picks out a track on the sidewalk.

When the old pavé has been pulled out, a cement bed will be laid and on this will be formed a surface of small granite blocks, considered after extensive experiments to be the best material for a highway intended for mechanical traction. A cheaper method of construction would have been cast composite blocks, formed of stone and cement, but experiments showed that it wore rapidly, generated dust and in consequence would give a muddy surface in wet weather. The granite will be obtained from Norwegian quarries, cut to required size by special machinery and shipped at a low price as ballast. It is believed that this will give a perfect surface, which, if horses could be removed from the highway, would be always free from dirt and naturally dustless and mudless. From the same Porte de Neuilly two other roads constructed on the same principles will start out for other parts of the provinces; in all there will be eight granite paved automobile roads giving egress from the walled city to points north, south, east and west. Among those coming in for improvement is the old cobblestone royal road from Paris to Versailles, passing through Billancourt and crossing the river at Sevres. This is at present abandoned to the light railroad and market carts, chauffeurs preferring the circuitous hilly road above Saint-Cloud to the jostling received in the valley. In addition to the radiating highways, there will be a granite-paved circular road varying from ten to twenty-five miles from the city limits, forming a belt around the town and intersecting every road. Thus a tourist arriving on some by-road between two of the paved highways will only have to travel along the circular road a few miles to meet a perfect track carrying him into town.

Credit for this interesting road making scheme lies about equally with the Touring Club of France and the Touring Commission of the Automobile Club of France, the heads of the two bodies working out the details of the scheme, making experiments in connection with road engineers and using all their influence with the Ministry. Since the scheme has been officially announced the A. C. F. has voted a subvention of $6,000 towards the work. In three years the scheme will have been fully completed and entrance to the Ville Lumière will be a pleasure instead of a purgatory. Experts will watch with interest the experiment of granite paving for a network of roads open to heavy traffic of all classes, as this is the first time that road construction of this kind has been planned for auto use.

SUIT INVOLVING DARRACQ DISSOLUTION.

PARIS, Aug. 1.—There are possibilities of a complete revolution in Franco-British relationships if a recent action brought against the Darracq firm meets with success. At the Tribunal of Commerce, this week, three of the most distinguished lawyers of France, acting for a group of persons whose names have not been made public, petitioned for the dissolution of the A. Darracq Company, Limited, on the grounds that the headquarters of the company were in London while the factory was in France. M. Poincaret, a former Minister of Finances, representing the Darracq Company, opposed the motion. Judgment was deferred.

Within the past few years a large number of prominent French automobile firms have been converted into British limited liability companies, on account of the better hold they would have on the British market and various administrative advantages.

Officers of the Darracq company, interviewed on the petition, declare emphatically that the whole affair is one of private jealousy, and maintain that there is nothing on the statute book preventing a French factory having its official headquarters in another country. The head of a rival firm, having large interests in England, is declared to be responsible for the proceedings.

FRENCH DRIVERS MUSTN'T RUN AWAY.

PARIS, Aug. 1.—To run away from the scene of an accident, or in any way to seek to evade the responsibility of an accident in which he may have been involved, will in future render the offender liable to from six days to two months in prison and a fine of 16 to 500 francs. The new law applies not merely to drivers of automobiles, but to those in charge of any kind of vehicle whatever, and is applicable to the whole of France. Its effect will be to make it impossible for any driver, whether he be in charge of a push cart or a racing automobile, to escape from an accident in which he has been involved and for which he may or may not be responsible. Rather than risk long and costly legal proceedings it has become too common for French automobile drivers, as well as drivers who do not sit behind a wheel, to pass on their way without stopping to inquire what damage they have caused. The new law, in no way changing the original statute on civil and penal responsibility, will naturally have the effect of checking irresponsible driving by rendering the practice of running away in order to escape the consequences of an accident of any nature, one not to be indulged in indiscriminately by chauffeurs.

CHICAGO NEXT WINTER WILL ONLY HAVE ONE AUTO SHOW

THERE will be only one automobile show in Chicago next winter. The show committees of the National Association of Automobile Manufacturers and the American Motor Car Manufacturers' Association Tuesday morning conferred in New York City and reached an understanding relative to the Chicago show situation. It will be remembered that the A. M. C. M. A. was not exactly satisfied with the previous manner of allotting spaces, and it was made known that unless its members received more consideration the association might conduct its own exhibition.

Tuesday morning the show committees of the two organizations held a session. The N. A. A. M. committee includes Thomas Henderson, Windsor T. White, George Pope, W. E. Metzger, C. C. Hildebrand and S. A. Miles, the general manager. The A. M. C. M. A. committee contains Benjamin Briscoe, H. O. Smith, R. M. Owen, S. H. Mora and Alfred Reeves, the general manager.

In accordance with the resolution adopted at the July meeting of the N. A. A. M. show committee a new method of space allotment was submitted, and this met with acceptance from the A. M. C. M. A. committee. Briefly stated, the spaces are divided into four classes, and the selection of positions is to be determined by lot. Providing there are more applicants for spaces than can be accommodated in any class, the executive committee of the N. A. A. M. will classify the applicants, and in so doing N. A. A. M. members will have first choice, and A. L. A. M. and A. M. C. M. A. members will be given second choice, though the committee will be guided further by the number of models produced by the applicants, the number of earlier shows at which the applicants have exhibited, and the size of the space occupied thereat. The arrangement practically means that N. A. A. M. members, whether licensed or unlicensed, will receive equal consideration in the allotting of exhibition spaces.

The regular monthly meeting of the N. A. A. M. executive committee, held in the afternoon, considered other matters, and granted sanctions for national shows, the A. M. C. M. A. exhibition at the Grand Central Palace being for the first week in January, and the A. L. A. M. show in Madison Square Garden being for the third week in January. A special committee appointed to consider and recommend a standard form of rim presented a detailed report, which was adopted, subject to satisfactory commercial details. The facilities of the transportation department of the N. A. A. M. will be extended to the A. M. C. M. A., in consideration of the agreement on the part of that body to cooperate in the work. Arrangements with the Motor and Accessory Manufacturers are still pending.

Present at the meeting were: S. T. Davis, Jr., W. T. White, Charles Clifton, Thomas Henderson, W. E. Metzger, Benjamin Briscoe, H. O. Smith, L. H. Kittridge, R. D. Chapin, W. Mitchell Lewis and S. A. Miles, and, as members of special committees, M. J. Budlong and G. W. Bennett.

POPE COMPANY TO REORGANIZE WITH $6,500,000 CAPITAL

HARTFORD, CONN., Aug. 3.—The long-predicted reorganization of the Pope interests that was formally announced for the first time late last week, is now under way. Briefly stated, the plan is to eliminate the common stock of the old corporation entirely, capitalize the company's indebtedness to a certain extent, and confine manufacturing to the Hartford and Westfield plants, the latter of which is devoted to bicycle making. Articles of incorporation may be asked for under the laws of New Jersey or in the company's home State, the projected capitalization being $6,500,000, of which $2,500,000 is to be preferred stock and the remainder common. A small coterie of New York capitalists was apparently responsible for bringing about the reorganization at this time, a committee appointed from their number consisting of Harry Brommer, of Hallgarten & Company; Frederick H. Ecker, treasurer of the Metropolitan Life, and August Heckscher.

Not including the amounts due to companies, the capital stock of which is owned by the Pope Company, the present indebtedness of the latter totals $1,640,000. There is now preferred stock of the face value of $2,391,000, and second preferred of the value of $8,625,100, outstanding, and the plan of reorganization is offered to the holders of such stock, based upon the deposit of their certificates with the Central Trust Company of New York. To actually begin business, notes to the amount of $800,000 will be issued in such amounts as the committee above named may deem necessary. These notes will be dated August 1, 1908, and will mature as follows: August 1, 1909, $267,000; August 1, 1910, $266,000, and a like amount one year later, the interest being at 6 per cent., payable semi-annually.

It is understood that the same personnel will be in control, namely, Albert L. Pope and Colonel George L. Pope, Wilbur C. Walker and Charles E. Walker.

PLANS FOR THE MAXWELL-BRISCOE AND BUICK COMBINE

NEGOTIATIONS for the consolidation of the Maxwell-Briscoe Company, of Tarrytown, N. Y., and the Buick Motor Company, of Jackson, Mich., which for some months have been more than merely whispered as being in progress, have reached now such an advanced stage that it is announced that the International Motor Company is in process of formation, with a capital of $25,000,000, made up of $11,000,000 common and $14,000,000 preferred stock.

Preferred stock to the amount of $900,000 is shortly to be put on the market at 97 1-2, with a share of common stock as a bonus, by the underwriters of the scheme, who are connected with J. P. Morgan & Co.

The attorneys engaged in the formation of the new company are Ward, Hayden & Satterlee. The junior partner is the son-in-law of J. P. Morgan. Another son-in-law of the noted financier, W. P. Hamilton, and W. P. Horn, a member of the staff of the banking house in question, are interested in the formation. So is Otto J. Merkle, of No. 40 Wall street, New York, who has back of him the Maxwell-Briscoe interests.

The holders of Maxwell-Briscoe preferred stock will receive two shares of preferred stock of the new company and one share of common stock for each share of the original preferred stock. At present $660,000 preferred stock out of $750,000 authorized is outstanding, and $660,000 common stock out of $750,00 authorized is also outstanding.

The prospectus issued estimates a possible production of 13,000 cars this year, including those already finished, and places the 1909 product conservatively at 15,000.

THE AUTOMOBILE

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CLASSIFYING THE AUTOMOBILE BUYER.

Unconsciously, but none the less surely, the automobile buying public in this country has gradually been classifying itself, until now it may be said that the process has reached a point where three sharply defined divisions are discernible. Starting at the upper end, the first of these will naturally be found in that class of buyers who have made the 60 to 80-horsepower touring car a commercial possibility. This is the type of buyer whose needs can only be compassed by the seven-passenger touring car, and who invariably employs a driver. The class is a substantial one, and doubtless will always play a prominent part in the American demand, for, though the number of such cars may be relatively small, their value forms a very considerable proportion of the year's total when figured in dollars and cents. Next in order comes that very much larger class, the needs of which are met by the five-passenger touring car or roadster of half the horsepower, and which may, or may not, have a professional driver to look after it, according to the means or inclination of its owner. At the present writing, this is doubtless the most important class of the three, all things considered, the next step below it consisting of that legion of auto owners who go in for light runabouts and are always content to act as grooms to their own machines.

Judging from the announcements of those manufacturers who have already made their plans for 1909 public, it is quite apparent that the business of building automobiles has been classifying itself at the same time, and that not a few makers have decided to appeal to that very large and constantly growing class which we have designated as the second, or that intermediate the two extremes. It appears quite probable that this class is destined to predominate, as it is not only constantly being added to by the influx of new entrants, but also receives a very substantial addition in the shape of recruits from the class below it, as the light runabout is frequently but a stepping-stone to something more ambitious.

The period of transition through which both automobiles and automobile buyers have been passing, brings forth as a result a machine, the coming of which has been predicted for several years past. Why it did not appear on the scene earlier in the day is but one of the many puzzling queries that have surrounded things automobile ever since the inception of the latter. Evidently the time was not ripe, for many automobile builders were perfectly aware of the requirements and not a few possessed adequate facilities to have made what is now considered one of the greatest developments of the day a possibility two or three years ago. Very early in the day, when the superiority of the foreign-made machine was self-evident, the question was universal "Why do American manufacturers not give us what we want?" and their reluctance to part with exclusive and self-made standards of design at that time, evidently found its successor in the hesitancy which heretofore has characterized efforts to bring out medium weight and powered machines of the types that are now appearing.

* * *

SIMPLIFYING THE COOLING SYSTEM.

Simplicity may be taken as a synonym for the smallest number of parts, and, bearing this in mind, the two-cycle motor with thermo-siphon cooling may be held up as an ideal where the water-cooled engine is concerned. But as yet, the two-cycle principle has not been accorded that favor which its possibilities deserve, so that simplifying the motor in this respect resolves itself into a question of pump or no pump? That the pump can well be dispensed with is amply demonstrated by the great number of successful cars on which the water is circulated on the thermo-siphon principle, and there appears to be no good reason why this should not be more generally adopted, if, indeed, it does not come into practically universal favor. It has been shown that the extra quantity of water necessary is a negligible factor when the advantages of the system are taken into consideration.

The present trend of design is leaning more and more strongly toward the adoption of the thermo-siphon principle and the consequent elimination of the auxiliary that it renders unnecessary, as the practice of casting three and four-cylinder units in one piece permits of making a jacket in which the water may circulate much more freely than in the single or even the twin-cylinder casting. Another great advantage of combining the cylinders in a single unit in the case of a four-cylinder motor, or two units in the case of a six, is to be noted in the greatly simplified arrangement of the small amount of piping that is necessary, this being a benefit that extends to the elimination of the exhaust and inlet manifolds as well.

SIX-CYLINDER CHADWICK ENTERED IN VANDERBILT CUP RACE.

THE Vanderbilt Cup Commission has received from L. S. Chadwick the entry of a six-cylinder Chadwick car for the Vanderbilt Cup Race. All the experts at the Chadwick Engineering Works, Pottstown, Pa., have been turned loose on the racer and Mr. Chadwick expects to have it out on the new cement racing highway during the first week of October. This will give the driver, Willie Haupt, ample opportunity to learn the course before the elimination race, October 10.

The Chadwick racer will be a stock model in many respects, similar to those which have been so successful this year in hill climbs and other contests. It carries the standard six-cylinder motor, with cylinders 5 inches in bore by 6 inches stroke; the change gear gives four speeds forward, controlled selectively, and drives through side chains enclosed in special chain cases. Wheelbase is 112 inches, and the tires are 34x4-inch front and 36x4 1-2-inch rear. Equipped with a special racing body it will weigh 2,550 pounds. In cylinder bore and weight this car conforms to the so-called international rules of the Grand Prix, and its makers are anxious to see how it will compare with the winning Mercedes, driven by Lautenschlager in the Grand Prix, and which Robert Graves has bought and entered in the Vanderbilt.

Those who follow the racing game will remember that the Mora Motor Car Company, Newark, N. Y., has already entered a six-cylinder racer, and still another car of this type is expected to carry the colors of the Acme Motor Car Company. The latter does not intend to make the usual mistake of companies new to this work of finishing its car too late for any preliminary road work. The engine has already been assembled and tested in the factory at Reading, Pa., and found satisfactory, and it is expected that the complete car will be out on the roads of Berks county by August 15. Specifications include a six-cylinder engine of a bore slightly less than 5 inches and 5 inches stroke; the wheelbase will be rather shorter than the six-cylinder cars of this make already seen on the track, and in spite of the larger engine the weight has been decreased. Attention is being paid to quickness in picking up speed, as the makers believe that this quality will have an important effect on the success of the car in the race.

THAT INEFFECTIVE FOREIGN BOYCOTT AGAINST VANDERBILT

PARIS, July 30.—Since announcing an official boycott of the Vanderbilt Cup contest, the attitude of the leading members of the French Racing Board appears to be one of complete indifference regarding the quarrel between the American Automobile Association and the A. C. A. Instead of that righteous indignation which in certain quarters we are given to believe exists in the French Club against the action of the Vanderbilt Cup commission in announcing its race under independent rules, the Frenchmen declare, in substance, that they have put their protest on record and have no desire to be troubled further in the matter. The French Racing Board has enough troubles of its own on hand to prevent it having any very strong feelings on a quarrel between two automobile bodies several thousand miles away.

It is freely recognized in Paris that the boycott is more theoretical than practical. To put it in the vernacular, "it is for to laugh." Every manufacturer, though he voted the protest, is aware that if he desires to enter the Vanderbilt Cup race there is nothing whatever to prevent him. The fear that the French cars would be disadvantaged, which was doubtless felt by certain constructors a few months ago, is no longer a bogey. Instead of being slower than last year, the cars have proved, in a brutal manner, that they are not only faster, but too fast, the French failures being due to speeds that tires could not maintain.

Speaking to one of the leading officials of the Commission Sportive, the representative of THE AUTOMOBILE asked what steps would be taken if French firms sold their cars to be raced by private owners, or handed them over to their American agents to enter. Without hesitation, the reply came: "We could do nothing whatever in such a case." It is well known that negotiations are pending, and may be completed before this arrives, for the sale of the Mercedes victorious in the Grand Prix and for the transfer of the services of the winning driver to an American sportsman, who would enter them in the Vanderbilt race. Although Germany was one of the protesting parties, her officials can find no grounds whatever for objecting to such a course. The same is also true of those French firms who feel they would like to again compete for the cup won three times in succession. William K. Vanderbilt, Jr., is still in Paris.

METROPOLITAN TRADESMEN FORM RACING ASSOCIATION

AT a meeting held in New York, Friday, July 31, a local racing organization of tradesmen was formed, to be known as the Metropolitan Motor Association. Its charter membership is made up of three importers, three manufacturers and two local dealers who have been prominent in racing in the metropolitan district. The officers are: President, C. F. Wyckoff; vice-president, E. R. Hollander: treasurer, Harry S. Houpt.

Those who were present at the meeting and make up the charter membership follow: C. F. Wyckoff, of Wyckoff, Church & Partridge, Eastern sales agents of the Stearns; E. R. Hollander, Auto Import Co.; H. A. Lozier, Lozier Motor Co., maker of the Lozier; C. A. Singer, Palmer & Singer Mfg. Co., maker of the "P. & S." and selling agent of the Simplex; Paul La Croix, American representative of Renault Frères; C. M. Hamilton, Isotta Import Co.; Harry S. Houpt, New York agent of the Thomas; F. E. Moscovics, Allen-Kingston Co.

The objects of the association are stated to be:

First—To support only such contests held in and within 75 miles of New York City which have for their first object the stimulation and growth of public interest in automobile events which shall benefit the sport and industry as a whole

Second—To eliminate inexperienced drivers and officials.

Third—To regulate the number, length, and condition of contests.

Fourth—To safeguard the interests and safety of all contestants and the public by rigid supervision of courses.

In its official announcement the association declares that "the statement recently made in some of the New York papers, that this organization was to be formed to oppose the A. A. A. or A. C. A., is entirely erroneous, and is denied by the president of the association. It is hoped that some amicable arrangements can be arrived at whereby all interests, including clubs, associations and contestants, can get together on a proper basis without friction."

The association plans to promote a race meet at the Brighton Beach track on or about Labor Day. A program of at least six sprint contests is proposed, winding up with a 24-hour race. Fred J. Wagner has been secured as manager. A broadening of the membership of the association is contemplated.

CLUBS GROWING STRONGER AND MORE NUMEROUS

NEW JERSEY CLUBS CALL A CONVENTION.

NEWARK, N. J., Aug. 5.—New Jersey is to have a good roads legislative convention of its own. It is planned to hold it at Atlantic City early in September, probably 17-18. The co-operation of the farmers, as represented by the New Jersey State Grange, is to be asked. In view of the alliance completed at the Buffalo convention between the A. A. A. and the National Grange, the prospects of similar cooperation between the automobilists and farmers in New Jersey are bright.

The present unreasonable state motor vehicle law, which this year is keeping so many automobilists out of the state, to the great loss of hotel keepers and general business, will also come up for discussion, with a view to amendment along sane and just lines, at the next session of the legislature.

The decision to call the convention was made by the Associated Automobile Clubs of New Jersey at their meeting at Atlantic City last Saturday. It was further resolved to make every effort to organize autoists in localities where no clubs now exist, to

W. C. Crosby.
President Associated Automobile Clubs of New Jersey.

H. A. Bonnell.
Secretary Associated Automobile Clubs of New Jersey.

the end that the state body may be strengthened and carry with it the weight of larger numbers and present a more general representation of the counties of the state at the convention and before the legislature next winter.

There were several changes made in the official slate at the meeting that will give the New Jersey Automobile and Motor Club not only the largest motoring organization in the state, but also one of the largest in the country, the leadership in the administration of the state body. W. C. Crosby, vice-president of the club in question, was chosen president in place of George W. Post, of the North Jersey Automobile Club, of Paterson, resigned, and H. A. Bonnell, former secretary of the same club, a man of national reputation as an organizer and executive officer, was persuaded to get into harness again and assume the office of secretary-treasurer.

The following committees were appointed:

Legislation—W. C. Crosby, J. H. Edwards, J. H. Wood, A. H. Darnell, J. E. Gill.
Membership—Dr. F. C. Ard, J. E. Gill, H. A. Bonnell.
Good Roads—J. H. Edwards, J. H. Wood, Warren Somers.
Press—W. E. Edge, W. F. Sadler, Jr., A. G. Batchelder.
Touring—C. A. Post, K. G. Roebling, H. B. Cook.

It is probable that John W. Griggs, former governor of New Jersey, and more recently United States Attorney-General, will have charge of the suit that is to be brought next November to test the constitutionality of the Frelinghuysen law.

ATLANTIC CITY CLUB HELPS PRESERVE LAW.

ATLANTIC CITY, N. J., Aug. 3.—The feeling of soreness anent the "copping of a good thing" by the Atlantic City Automobile Club's yellow-flag contingent still exists among the energetic country constables and coin-hungry magistrates of Atlantic county. And the yellow-flaggers have not been arrested, either, as the authorities threatened when they made their first appearance last week. The A. C. A. C. officials point out to the county officials that the flaggers are merely to prevent infractions of the law; not to prevent arrests.

All week long each trap on every road leading into this city has been "tipped off" to the incoming autoists, and a more sedate set of drivers of long, low, rakish craft never ambled into the city by the sea. True, the scheme is costing the automobile club a little money; but as the bonifaces are helping some and the expressions of satisfaction from motor visitors over the condition of things are numerous, the club's officials feel amply repaid. The latter came out with the statement this week that they were quite as anxious to stop illegal speeding as were the county officials, and were prepared to arrest and prosecute offenders as well. In the face of such an announcement the county officials haven't a leg to stand on, and the yellow-flaggers will continue to work unmolested till the end of the season.

LOUISVILLE CLUB TO INVITE HOTCHKISS.

LOUISVILLE, KY., Aug. 3.—The July quarterly club meeting of the Louisville Automobile Club was held at Bruen's Garden, and proved a most enjoyable affair. Owing to the absence of the president and vice-president from the city, ex-President George H. Wilson was made chairman. It was decided to invite President Hotchkiss, of the American Automobile Association, to be the club's guest during the holding of the proposed race meet this fall, at which time the club is to give a banquet. Among other items of business transacted, committees on tire protection, racing and highways were appointed. The first consists of R. O. Bruer, George H. Laib and Benjamin B. Watts, while J. M. Chatterson, Ira S. Barnett, Dr. F. S. Clark, Walter I. Kohn and Hubert Levy will look after racing, and Hubert Levy, Dr. Leavell and Prince Wells will constitute the highway committee, the first member named being the chairman of his respective committee.

MORE SIGNBOARDS FOR SYRACUSE ROADS.

SYRACUSE, N. Y., Aug. 3.—Forman Wilkinson, the secretary of the Automobile Club of Syracuse, has placed an order for another 75 route and danger signs, and the work of "labelling" this section is proceeding with steadiness and dispatch. The next routes which the club intends to post are those leading from here to Sherburne, Rexford Falls and Richfield Springs. This is a big undertaking for the club single-handed, but the routes are so popular with automobilists that the officers have decided to do it.

Mr. Wilkinson points out to prospective members the advantages of having an organization to fight anti-automobile legislation. During the last session at Albany not less than 21 measures were introduced discriminating against automobiles, and that none of these found passage was due to the efforts of the New York State Automobile Association.

MARYLANDERS DISCOURAGE SPEEDING.

BALTIMORE, Aug. 3.—That the members of the Automobile Club of Maryland are sincere in their determination to discourage speeding in this city and State was demonstrated by their prompt action at the last meeting, when they passed a resolution condemning the race between an automobile and an airship,

which was one of the attractions at an amusement park. The automobile which called forth the action of the club belonged to Isidor Wolf, and was of 60 horsepower. The race was from the park in question to the City Hall and return. The members of the club say that such contests are injurious to automobilists in general and that they will try to have them stopped.

ACTIVITIES OF THE MINNEAPOLIS CLUB.

MINNEAPOLIS, MINN., Aug. 1.—The annual outing for the orphans of Minneapolis last Tuesday was the most successful event of the kind ever held here. Over 50 automobiles were provided, and the 200 children and 50 nurses were given a complete tour of the cities and parks of Minneapolis and St. Paul. After dinner and games at the Country Club there was a long drive to Minnehaha Falls and Fort Snelling.

The Minneapolis Automobile Club will decide this week whether or not it will go ahead with its plans for a floral parade during the week of the Minnesota State fair. The club members and the business men of the city are in favor of the parade, but the State fair officials have protested against it because it would draw the evening crowds away from the fair grounds. The relations between the two boards are rather strained at present on account of a deficit at last year's race meet, which the fair managers refused to make good.

FLORIDA AUTOMOBILISTS FORM A CLUB.

TAMPA, FLA., July 30.—A large number of auto enthusiasts of this city met one evening last week at the Board of Trade rooms and formed a temporary organization. T. E. Bryan was elected chairman and J. J. French secretary. While the club is to be known as the Tampa Automobile Club, its membership will not be restricted to residents of the city, but every owner of an automobile in Hillsborough county will be urged to join. Plans for a permanent organization were discussed, and a date set for another meeting, when it is hoped every auto owner in the vicinity will be present. The club's slogan is "Good Roads."

ECONOMY CONTEST AT HARRISBURG, PA.

HARRISBURG, PA., Aug. 1.—Many entries are expected in the economy contest which will be held by the Motor Club of Harrisburg on Saturday, August 15. The contest committee has not definitely decided on the course, but a hill may be included, in order to catch any cars which adjust their carbureters too finely to permit them to do any climbing on the high gear. One of the features of the contest will be a class for electrics. Valuable prizes will be given to the winners in each of the eight classes.

A. C. OF HARTFORD GROWING RAPIDLY.

HARTFORD, CONN., Aug. 1.—The membership of the Automobile Club of Hartford has now reached the 300 mark and more are on the waiting list. The annual hill-climb is the next event scheduled and the club expects to make it an even greater success than that of last year. Everett J. Lake, a prominent member of the club, has received the Republican nomination for governor. The Lake Club has been formed to support him, composed largely of his fellow-members of the Automobile Club. His election appears to be practically assured.

THE DEATH OF A FAMOUS FRENCH MAKER

PARIS, July 30.—A link with the past has been broken by the death of Louis Réné Panhard, one of the founders of the Panhard-Levassor Company, which took place at La Bourboule, where the deceased was undergoing a course of treatment. M. Panhard, who was in his sixty-seventh year, had been in failing health for some time, and although retaining a seat on the board of directors of his company took very little active part in the management. The last two years of his life had largely been spent at the small town of Thiais, of which M. Panhard was mayor.

It was in 1883 that the old-established firm of Perin, Panhard & Cie. became Panhard & Levassor, M. Perin having died and Levassor, up to that time one of the most important engineers, being elected as partner. The firm was then established in the Avenue d'Ivry, Paris, on the site of the present Panhard-Levassor factory, and was engaged in the manufacture of band saws and woodworking machinery. In 1889, M. Sarrasin, the holder of the French patents for the Daimler engine, requested the Panhard-Levassor firm to build him a motor according to plans which he supplied. Panhard agreed, the actual work being placed in the hands of his partner, Levassor. The same year Sarrasin died, his widow secured the patents, but, knowing nothing of mechanics, engaged Levassor as her engineer and took him with her to Germany to arrange the formalities attendant upon the dissolution of the German syndicate. On their return Madame Sarrasin was engaged to be married to Levassor, and it was in this way that the Daimler patents entered the Panhard-Levassor factory.

A small portion of the workshop was set aside for the construction of horseless carriages, eight men being employed on a quadricycle of one and three-quarter horsepower. After nearly three years' labor the little high-wheeled, ugly-looking buggy was able, towards the end of 1892, to run from the factory to the Pont du Jour and back, a total distance of about six miles, without a stop. It was the first success, and also the occasion of the sale of the first automobile the world had known, the buyer being M. Verlinde, a manufacturer at Lille.

Panhard and Levassor kissed one another; the former proposed to build a special factory; the latter replied "You are mad." The factory was built, it produced the car which won the world's first automobile race from Paris to Rouen in July, 1894; and a year later was victorious in the Paris-Bordeaux and return race with a 4-horsepower motor driven by Levassor. In 1896 the firm took part in the Paris-Marseilles-Paris race, during which Levassor overturned his car and received injuries which caused his death the following March, at a time when all ill-effects appeared to have been overcome. The firm was then converted into the Société des Anciens Etablissements Panhard et Levassor, with a capital of $1,000,000, which was subscribed by several members of the firm and their friends.

While continuing the manufacture of woodworking machinery, which is even now a branch of the firm's activities, the Avenue d'Ivry factories were considerably extended, and an era of success was entered upon which is without parallel in the history of the automobile industry. In the course of a few years the whole of the Avenue d'Ivry factory, comprising the ground, buildings and machinery, has been paid off, and is put down on the balance sheet at a franc. It is declared that if the manufacture of cars were stopped there is still a reserve fund to pay the shareholders a perpetual five per cent. dividend.

It is interesting to note that what is known as the Panhard car owed very little to Louis Réné Panhard, most of the early experimental work being done by his partner Levassor. Although Panhard was always a moving spirit in the conduct of the firm, he was not, even after the death of his partner, responsible for various mechanical improvements which kept the firm in a leading position for a number of years, and which have tended to give it a world-famed position.

The funeral ceremony of the late M. Panhard took place at the Madeleine Church, Paris, and was attended by practically all the French constructors, leading members of the Automobile Club of France and by a strong delegation from the factory. M. Panhard was an officer of the Legion d'Honneur and a chevalier of the Merite Agricole.

Miss Alice Potter and Party, of Elgin, Ill., in Their Haynes Car.

A WOMAN'S LONG-DISTANCE TOUR.

Miss Alice Potter, of Elgin, Ill., arrived in New York July 29 with her three friends, Mrs. Ada Dangerfield, Misses Elizabeth Forrest and Elizabeth Hunt, having completed the first half of her Elgin-New York-Elgin tour in just nine days. Miss Potter, who drives a 30-horsepower Haynes, had put some 15,000 miles to her credit before starting, all with a perfect score. She has never yet taken a mechanic with her on her tours, and personally superintends any work that is done upon her car. The party tours in leisurely fashion, enjoying the pleasures and sights along the way and stopping whenever and wherever the fancy takes them; all thoughts of records and averages are banished. As it is still quite unusual for ladies to take such a long tour in an automobile unaccompanied by any of the sterner sex for use in case of emergency, the different clubs took great interest in it. At Tarrytown they were met by Manager Heddington of the Haynes New York branch and escorted into the city.

PRESIDENT ROOSEVELT NOW VISITS IN AUTO.

The nation's chief executive has now come to realize the convenience and dispatch afforded by the power-driven vehicle, and is no longer loath to make use of an automobile whenever the opportunity affords. The photograph shows him in one of the government White Steamers on his recent visit to the encampment of Squadron C of the State Militia, at Huntington, L. I.

STODDARD-DAYTON AGENTS CONGREGATE.

DAYTON, O., Aug. 1.—This city has always been recognized as the home of sales and manufacturing organizations, and that perfect organization is the watchword of the Dayton Motor Car Co. was exemplified at the second annual convention of Stoddard-Dayton agents, July 29, 30 and 31. This meeting was attended by about 80 agents, who came from the Atlantic to the Pacific, and from Canada to Texas.

Wednesday was devoted to the inspection of the '09 models. These were on exhibition on the seventh floor of the new building, and embraced twenty-three types of bodies on four chassis, together with a display of all parts of the various motors, transmissions, axles in various stages of manufacture, from the rough steel to the finished product. A sectionized motor was used to show the complete lubricating system. This motor, which was electrically driven, had a glass covering over the cam gears and the same over the two rear cylinder openings on top of the crankcase, an electric light in the crankcase showing the absence of splash and the uniformity of the oil reaching the wrist pin and thence to the cylinder walls, as well as the constant lubrication of the cam gears. The chassis shows improvements in many details, including the strengthening of some parts and an increase in the wheelbase. The gear lever is now placed outside the frame on a special dust-proof quadrant, and an accelerator has been added to the throttle system.

The inspection of the models was concluded Wednesday evening by a Dutch supper at the Hofbrau.

Thursday was devoted to a thorough discussion of trade and selling conditions and the accessories equipment of the '09 cars. On Thursday evening, at a banquet in the Dayton Club, C. G. Stoddard acted as toastmaster, and the following toasts were proposed and responded to: "The Future of the Industry," by R. Y. Houk; "Observations of the Public," by J. M. Cox; and "As You See Them and as They Are," by F. A. Barder.

On Friday morning repairs, advertising and miscellaneous matters were talked over. At a picnic held on Friday afternoon at Wise's Camp the contests were all entered into with enthusiasm by the entire force of agents. The challenge cup was won by Mr. Sears.

Excitement was aroused Friday morning by the arrival of the two Hower trophy cars, Nos. 107 and 112. These cars, which were withdrawn from the contest at Pittsburg, were driven to Dayton in time to be inspected by the several agents, who made favorable comments on the first-class condition of the much-driven cars, which might well have been expected to show some sign of what they had gone through in the tour.

President Roosevelt in a White Steamer on His Visit to the Encampment of Squadron C of the State Mili

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

The Standard Horn Mfg. Co., of New York City, has been incorporated with a capital stock of $1,800, and will manufacture automobile horns, etc.

An automobile stage line is being operated by H. F. Mitchener and Company between Selma and Smithfield, Johnston county, N. C. One large car is in commission and makes the trip in twenty minutes.

The Renault Frères Selling Branch, Inc., of New York, has just been organized as a corporation with a capital of $100,000. The incorporators are F. Renault and C. Richardière, France, and Paul Lacroix, of New York.

W. H. Van Dervoort, president of the Moline Automobile Company, feels that his company was extremely unfortunate in having all its eggs in one basket in the recent Glidden Tour, and says that there will be a team of three Molines entered next year.

Figures compiled by an Akron, O., rubber manufacturer show that the output of the rubber factories of that city last year equaled $33,000,000, and about one-third of that was in rubber tires. The capital invested amounts to $23,000,000, and the annual outlay for labor is $9,000,000.

W. Smalley Daniels, manufacturers' agent, representing several lines of motor requisites, has removed his office from the T. Alton Bemis Company, 358 Atlantic avenue, Boston, to larger quarters in the Motor Mart, Room 22, Park Square, that city.

A story comes from Logansport, Ind., to the effect that the Western Motor Works of that city, makers of the Rutenber engines, has received an order for $100,000 worth of engines, with the clause that in event of the election of Bryan the buyer has the privilege of cancelling the order. Although no decision has yet been made, the order will probahly be dcclined.

J. V. Thomas, manager of the Weed Garage, Toledo, O., has gathered a lot of useful touring information in a little route book which he is sending out. Routes are carefully described and mapped between Toledo and Chicago, Buffalo, New York, Columbus, Cincinnati, Indianapolis and Detroit. The booklet conveys the compliments of the Weed Garage and the Boody House.

Ground has been broken for the factory of the newly-organized Velie Motor Vehicle Company, of Moline, Ill. Thc company will manufacture high-wheeled automobiles, designed to mect the growing demand for such vehicles among farmers. hut the usual made-over buggy design will he avoided. The new huilding will be 80x 200 feet, three stories in height, and will be constructed of reinforced concrete.

It is generally admitted that a manufacturer's demonstrating car receives pretty hard usage, and when, in addition to this, it is used as the general errand car from the factory, it gives the machine as sevcre a try-out as is conceivable. The Hess-Bright Mannfacturing Company, Philadelphia, Pa., have just received a set of their ball-bearings taken from a Knox car so used for over 50,000 miles. Only two hearings needed refilling with slightly larger balls, the others being as good as the day they were put in.

For the coming year, the Maxwell-Briscoe Motor Company, Tarrytown, N. Y., has placed a contract for the complete lighting equipment of the 5,000 Maxwell cars of all types that will constitute its product for 1909 with one concern. This is the Rushmore Dynamo Works of Plainfield, N. J. The order will total close to $100,000 and is said to be the largest of its kind ever placed. In fact, it is not so long ago that thc average accessory manufacturer would have considered this a good figure for his entire year's business.

White Route Book, No. 7, just issued, makes a most important addition to the series of route books published by the White Company for distribution to tourists. As previous issues of the White Route Books contain road directions between New York and Buffalo, there are now available, for the first time, complete and accurate road directions between New York and Chicago. The new book also gives Harrisburg to Cleveland via Pittsburg, and is attractively illustrated.

The Rushmore Dynamo Works, Plainfield, N. J., announce that the appeal taken by the Manhattan Screw & Stamping Works from the decision rendered against them in the United States Circuit Court for the Southern District of New York, in which an injunction was granted the makers of the Rushmore lamps, has now been decided in their favor. This decision sustains the original order enjoining the defendants from making colorable imitations of the plaintiff's flare front design and appears definitely to settle the rights of the Rushmore company to this design.

This year's A. A. A. Reliability Tour was a harder test of automobile endurance than any that have preceded it, and the fact that 50 per cent. of the cars selected by the manufacturers for this grueling work were equipped with cork insert clutches and brakes, and that over fifty manufacturers are using cork inserts in their 1908 productions, are great testimonials of their value in automobile construction. Their use appears to bear out the claim of the makers, the National Brake and Clutch Company, 16 State street, Boston, that they are an element of insurance against clutch and brake troubles in new cars.

NEW AGENCIES ESTABLISHED.

The Brush agency in Washington, D. C., has been given to the Brush-Nichols Company, which has opened a garage and salesroom in the rear of the city post-office.

L. A. Perkins and C. C. Fletcher, of Rutland, Vt., have formed a partnership under the name of Perkins & Fletcher to handlc the Chalmers-Detroit in that city.

The Atlantic Motor Car Company, of 1776 Broadway, New York City, agents for the Stoddard-Dayton, will open a hranch in Newark next month. They are now erecting a large building at 2228-2230 Halsey street for that purpose.

W. L. Githens Brothers, of 1328 Michigan avenue, Chicago, have just been appointed agents in that city for the new E-M-F car, which is the product of the Everitt-Metzger-Flanders Company, of Detroit, and the preliminary description of which appeared in these columns recently.

Sidney A. Bean, general sales agent of the Autocoil Company, Jersey City, N. J., announces that a hranch office will be established in Detroit at 730 Woodward avenue. The new branch will be in charge of W. S. Austin, who has been connected with the engineering departments of the company for several years past.

PERSONAL TRADE MENTION.

J. B. Bartholomew, president of the Bartholomew Company, left Peoria, Ill., July 29, on a business trip through the East. Hc will stop in Detroit, Boston, New York, Philadelphia and Washington.

Stewart McDonald, vice-president of the Moon Motor Car Company, of St. Louis, is enjoying a six weeks' tour in his Moon car through New York State and Massachusetts.

Winton Sixes will now be handled in Buffalo by Ralph E. Brown, formerly of the Cleveland branch, who has succeeded O. L. Gooden. Mr. Brown is located on Main street, in the heart of auto row.

O. Y. Bartholomew, treasurer of the Bartholomew Company, Peoria, Ill., builders of the Glide cars, is to take charge of the firm's Eastern interests and will shortly establish his headquarters in Philadelphia.

The Perfection Spring Company, of Cleveland, O., announces that it has secured the services of E. F. Bunker, for many years connected with the automobile spring business, as manager for the territory east of Buffalo.

E. J. Moon, of the Moon Motor Car Company, of St. Louis, has returned from a two weeks' vacation tour through the resorts of Wisconsin and Minnesota, and reports the roads to be in very poor condition, generallv up to the hubs in mud. This was not as annoying as it might have been, however, as most of his time was spent in pursuit of the finny tribe.

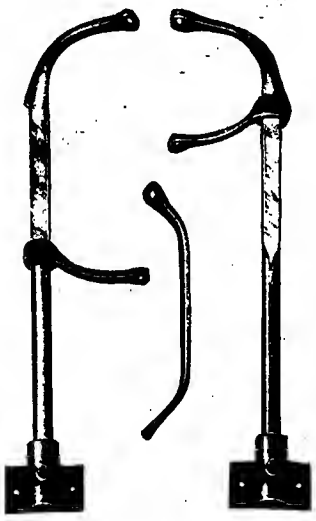
Harry Fosdick, of the Hol-Tan Company, 244 West Forty-ninth street, New York, has just returned from a three weeks' vacation and will immediately undertake the work of handling the new Lancia car imported by C. H. Tangeman. One of these cars is on view at the company's salesrooms in Forty-ninth street and examination shows it to have a numher of features which recommend it to discriminating buyers.

C. R. Hough has resigned as general manager of the Pope Automobile Company, of Washington, D. C., to accept a similar position with the Motor Car Company, agents in that city for the Peerless, Thomas, Stevens-Duryea, and Chalmers-Detroit. He succeeds W. C. Hood, who has been selected as sales manager of the Zell Motor Car Company of Baltimore. Elliott P. Hough succeeds his brother as manager of the Pope Automobile Company.

Joseph Grossman, for several years past treasurer and manager of the National Sales Corporation, has resigned from that position, and will embark in the special advertising field, with headquarters in Cleveland. Before assuming management of the National Sales Corporation Mr. Grossman was connected with the Continental Caoutchouc Company, and before that was a member of the firm of Emil Grossman & Bro., publishers of the *Motor Review*, which was purchased by the present owners of THE AUTOMOBILE.

INFORMATION FOR AUTO USERS

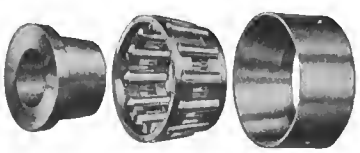
Adjustable Tire Bracket.—A new design of adjustable tire bracket has just been placed on the market by the Bi-Motor Equipment Company, 177 Portland street, Boston, which embodies several features



BI-MOTOR ADJUSTABLE TIRE BRACKETS.

that are entirely original. The attaching bracket takes up less room than is ordinarily the case with this class of fitting, and the brackets themselves are shorter and less bulky, thus making the attachment as a whole an ornament to the car, instead of giving it an awkward appearance. Being adjustable, these brackets can be used to hold one, two or three tires, and the construction is high quality, the straps being made of high-grade leather.

Grant Roller Bearing.—This was the first conical roller bearing to be placed on the market, being the prototype from which many others since introduced have been produced. It has been improved in a number of respects since it was first brought out, and is now being marketed by the Standard Roller Bearing Company, Philadelphia, Pa. The new bearing has solid rollers, with races and cones made of special steel, with the temper drawn, so that they are very tough and will not chip or break under the most severe service. The cone has an especially wide shoulder, against which the ends of the rollers have a bearing, practically to the center of the roll, the shoulder having the same degree of bevel as the ends of the rolls, the entire thrust being taken in this manner, thus giving great strength and durability. The cage, or retainer, holding the rolls, is made of the same general type as that used so successfully by this company for many years on its standard journal roller bearing. It consists of individual sockets or races, in which the ends of the rolls rest, and is made of solid steel with the two ends securely riveted together by means of a special electric riveter. The hot riveting makes the cage substantially one piece, and forms the strongest type of retainer that can be devised. It is impossible for it to twist out of shape, and as there are no small journals or pins on the rollers, the bearing is extremely strong and durable.



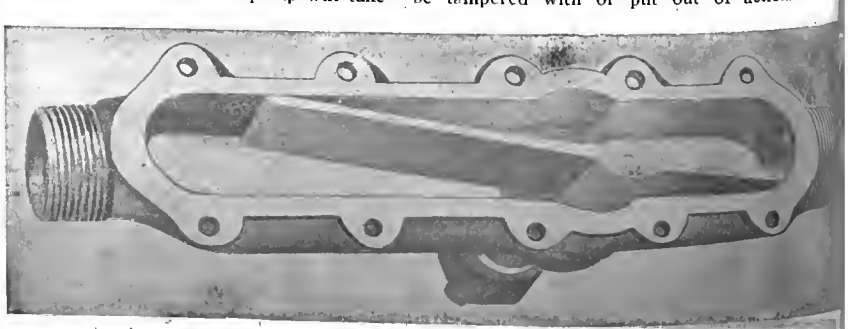
STANOARD GRANT ROLLER BEARING.

Albany Grease.—The name "Albany" on a lubricant means that the grease has the backing of many years' experience in its manufacture as the business of making Albany Grease was first undertaken in Albany, N. Y., forty years ago. The little establishment of the pioneer founder of the name, Adam Cook, was outgrown many years ago, and for the past seventeen years the products put out under this brand and which have achieved an enviable reputation the world round have been manufactured in the two large buildings located at 313 West street and 520 Washington street, New York City. The business is carried on by the sons of the originator of Albany grease, the firm being known as Adam Cook's Sons. Albany grease was the first lubricant of its kind to be used in the gear boxes of automobiles in this country, and it has since come into large demand for this purpose, while its use on the car has been extended to every location requiring a solid and reliable lubricant.

Circulation Pump.—New ideas in mechanics are not so frequently in evidence that we can afford to overlook them. In fact, an invention involving a new principle is very much of a novelty in the *au fait* mechanical world. The most recent device of that character to come under our notice is a surprisingly simple little circulation pump, a hasty glance at which would lead one to suppose it was a toy the purpose of which was not apparent by its design, but a critical examination by an expert will soon open his eyes to the fact that there is "something new under the sun." This circulation pump is certainly a wonder in the results it accomplishes; it is composed of an enclosed loose blade pivoted off its center, the pivot being set at the edge of a circular revolving disc. The model on demonstration at the show room of the manufacturer is fitted to standard 1-inch pipe, raises the water about 18 inches from the tap in the tank and discharges a full 1-inch stream when operated slowly by hand. When a 1-2 horsepower motor is attached the stream has such force as to give assurance that the rise would be much higher, if necessary, and the range of action very wide. The result is astonishing, and it is safe to predict that this circulation pump will take first place in the field, as it has high efficiency, is very simple, admits of the free passage of particles of wood, dirt, etc, cannot shut off the natural flow of water when not in operation; does not create a pressure of more than three pounds, therefore could not cause bursting or leaking of radiators or connections; and its cost is not its least attractive feature. The Circulating Pump Company, 1693 Broadway, New York, is marketing this article.

Lepaute Taximeter.—This taximeter is the one most generally used in all the principal cities of France and England, as well as the colonies. It is being introduced into this country by Ch. Dien, 45 West Thirty-fourth street, New York City, who is the general agent for the United States for this as well as a number of other imported specialties. A number are already in use on taxicabs in the metropolis and other American cities. It is manufactured by Henri Lepaute, Paris, an instrument making house established in 1740. The illustration shows the face of the taximeter with the instrument working on tariff one. When the flag is first turned down, an initial fare of 30 or 50 cents is at once registered, according to the rates of the company using the taximeter. During halts, the driver pushes the flag further down, and by so doing releases a clock movement, which registers a charge of 10 cents for every four minutes of waiting. In case of extras for trunks, additional passengers, crossing ferries and the like, the driver registers these himself by turning a knob on the back of the instrument. All the charges are totaled automatically by the instrument and appear through openings in the rear, so that a check may be kept on the driver, and it is impossible for the instrument to be tampered with or put out of action.

LEPAUTE TAXIMETER HANOLEO BY CH. DIEN.



SHOWING THE CIRCULATION PUMP COMPLETE, BUT WITH COVER REMOVED.

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THE AUTOMOBILE

Autoing in South America

By Sigmund Krausz.

THIS is written in Rio de Janeiro in the latter part of June of the present year. I left New York, May 1, on the steamship *Gunther*, with a view of introducing an American automobile in South America. I also made up my mind to study the automobile question from all points of view, but herein I shall confine myself to report only such observations as may be of interest to the readers of THE AUTOMOBILE and autoists in general.

In Bridgetown, on the island of Barbados, where a short stopover was not sufficient to go deeper into the matter, I had a chance to notice that the automobile has made its appearance even in the smaller islands of the Antilles. I even read in the Barbados *Advocate* of an automobile accident which had happened a few days before my arrival, and, in the same paper, I saw an advertisement of the single-cylinder Brush, claimed to be the best on the island.

Monroe Palace in Rio Janeiro

Autoing in Pernambuco

Street in Pernambuco

Avenue of Royal Palms, Pernambuco

Since it appears, from my information, that it has no competitors on the ground, there is no reason to doubt this assertion.

But in vain did I look about for auto tracks or gasoline and exhaust smells in Cabedello and Parahyba do Norte, the first ports of Brazil where I had a chance to spend some time ashore. Well, the first place is only a small village, but Parahyba has a population of 30,000. In spite of this fact, no jolly autoist has ever sounded his horn in Parahyba, and dogs and chickens are still living peacefully there and crossing the frightfully paved streets without danger to life and limb. Verily I believe that the appearance of an auto there would cause as much of a sensation as if the archangel Gabriel were to descend from heaven and blow the horn of resurrection. I doubt if very many Parahybanos are aware there is such a thing.

Avenida Central in Rio Janeiro

It was different in Pernambuco, my second landing place on the coast of Brazil. There are said to be 289,000 people living in this city, ten or twelve of which must surely have had more money than sense (I hope in the interest of the motor trade that none of these will ever read this copy of THE AUTOMOBILE), for I was told there were that many automobile owners in Pernambuco. How in the world any man, outside of a lunatic asylum, could get the idea to buy a car for use in this city is more than I can comprehend. I had a chance, through the courtesy of one of these gentlemen (again I hope he won't read this) to take a two hours' drive in a Clement-Bayard in the streets and environs of Pernambuco, and, if I live to-day to tell the tale, it is because my stomach and intestines refused to be shaken out of me. It was lucky that I had the idea of taking a snapshot of the car mentioned as it left the courtyard of my host, for after we started I was no longer in condition to think of anything but how best to resist the jolts and shocks I received during the course of that two hours' purgatory.

Similar conditions meet the autoist in Bahia, a city of 300,000 inhabitants, some 300 miles south of Pernambuco. There I met a man who knew a man who claimed to have seen an auto in town, but whether this is really so or whether the assertion is imaginary, I was unable to escertain. At any rate, the fact that I did not see a car in Bahia is proof positive to me that the people of this city are more endowed with gray matter or common sense than those of Pernambuco, for the pavements are certainly such as I have seen only in some of the worst streets of Constantinople. And what a delight it would otherwise be to motor in the winter months in and around Bahia amidst a luxuriant nature such as is rarely met with.

I had been told much and read much in magazine articles, consular reports, and other amusing literature about the great progress of South American republics, and especially that of the cities of Buenos Aires and Rio de Janeiro. Neither was I disappointed in the latter city, to which I proceeded from Bahia—by sea, as you may well imagone. There is not a mile of road in the country, outside the capital and Sao Paulo, that could be safely negotiated by an automobile, unless it be on a force tour to advertise a car, as was done lately by a French count, who made the trip between Rio de Janeiro and Sao Paulo, but with the resulting ruin of his car and an expenditure of several weeks' time. The distance, by the way, is less than 300 miles.

There are magnificent drives in Rio de Janeiro, of which I will speak a little later. For the moment, I want to dwell on my experiences in getting my Stoddard-Dayton out of the custom house and the necessary license for my demonstration to drive the car in Rio. I had met on the steamer the Austrian consul in this city, who gave me the cheerful information that it usually takes from two to three weeks, or even more, to clear a car from the "Alfandega," which is Portuguese for custom house, and it was not exactly with an easy heart that I looked forward to the red tape and annoying formalities of this procedure. But I have had business dealings with Latin-Americans before, and had, only lately, learned a lesson in Havana, the moral of which now proved useful to me.

I succeeded in clearing my car within 48 hours, but the hours of running, waiting, swearing, and talking in English, French, German, and with the help of an interpreter and native custom broker, in Portuguese, were agonizing. I wanted the car treated as a tourist's, or a sample car; *i.e.*, I only wished to deposit the amount of duty in the nature of a guarantee as a safeguard for me against the possibility of re-exportation, and although samples of other goods had previously been admitted on these conditions, mine was the first case of an automobile and had, therefore, no precedent. There were long consultations with various officials, and I was sent from Pontius to Pilate, but in the end I gained my object. Not, however, without using my influential letters of introduction to the Brazilian Secretary of State, Baron de Rio Branco, and the Secretary of the Navy, Admiral de Alencar. At that, I had to put in a written and stamped petition to the custom house authorities.

But it was only now that my real troubles started. I had the Stoddard-Dayton out of the "Alfandega," but was not allowed to run it on the streets. To make the thing short, I only state that for five days I wore the stone steps of the prefecture smooth in a chase from one official to the other, all of whom were politeness personified, but always showed me some clause in an ordinance or law which forbade just the thing I wanted them to do.

At last I got my precious document and four or five documents which entitled me now to chase through the streets of the Brazilian capital with my auto. For one does not drive rationally here, one chases at a go-as-you-please speed, even in the busiest districts. The cost of these documents figure up as follows:

65 milreis ($21.66) for an automobile license.
65 " (21.66) for examination of automobile.
23 " (11.00) for examination of chauffeur.
20 " (6.66) for chauffeur's license.

The examination of the car consisted of an official looking down from a second story window on the automobile, which stood in the street; that of the chauffeur in making a tour around the square in front of the municipal building. Then I got my number, 872. In regard to numbers in Rio de Janeiro the stranger is easily deceived if he judges the quantity of automobiles by them. The numbers run considerably over 1,000, although there are in all only about 300 cars in the city. This is explained by the fact that the city is divided into districts, numbered from one upwards, and the first, or first and second figure of the number carried on the car denotes simply the district in which the machine is registered. Thus my number 872 meant that the owner lived in the eighth district and possessed the seventy-second car registered therein.

My newspaper connections in the United States and a letter of introduction which I carried from the Press Club of Chicago got me next to the newspapers and eight of them gave me and my car most flattering notices of welcome in Brazil, and several of them used the opportunity to write at length on the abuses I had been put to at the prefecture. They also started a campaign for the abolition of the antiquated red tape and the introduction of a system, formed after the French pattern, in regard to tourist cars and samples imported for transitory use. Much amusement was caused in the city by the clever way in which an illustrated comic weekly, in a whole colored page, brought the matter to public attention, under the title of "Adventures of a Distinguished American Guest." The automobile club, too, took a hand in the affair, and thus I am quite proud of having given the initiative to a much-needed reform.

The cars owned at present in Rio by private owners and livery garages are principally of French origin, with a sprinkling of English, German, Italian, and American cars. The styles of cars vary, but the limousine and large touring body prevail, and some fine specimens may be seen during the semi-weekly *coros* along the bay, when gaily dressed women and children fill the vehicles which are driven up and down the Avenida Beira Mar between 5 and 6 P. M., Wednesdays and Saturdays.

Of livery cars, there used to be quite a large number on the streets, but lately they have diminished considerably, on account of a police ordinance which restricted their charge, and, at present only old and somewhat dilapidated vehicles stand for hire on the street. The price per hour was formerly 15 milreis (3 milreis equal $1) for the first and 10 milreis for subsequent hours for two persons; additional passengers, 1 milreis per person and hour. The charges now are 8 and 4 milreis, respectively, and the livery car owners claim not to be able to make a profit at these prices with decent cars in service. They rent now from their garages at the old prices and wait for a change in the police government and a return to the old rates. With that a renewed boom in the auto business is also expected. Among the livery cars on the streets I cannot omit to specially mention a curious and ridiculous looking little German runabout, called Piccolo; air-cooled, with two diagonally placed little 6-horsepower cylinders, all exposed, and room for only one person aside from the driver. About a dozen of these are in use, but not much in favor.

Motoring is practically confined to the city limits, and only the newly constructed avenues and streets afford pleasure. But these are really fine, and the splendid asphalt pavement of the Avenida Central, Uruguyana, Rua Florian Peixotto, and other thoroughfares, as well as the fine macadam of the Avenida Beira Mar, are unsurpassed motor roads of which any European city might be proud. And as to scenery along the latter road, I have, during my travels in many foreign lands, not seen anything to approach it. This magnicent avenue has been constructed within the last three or four years, as have been most modern improvements in Rio de Janeiro, and is, as yet, not quite finished, but the work is rapidly progressing, and within a short time the city will have, perhaps, the finest motor driveway in the world.

Altogether, motoring in Rio, in a climate where the winter corresponds to our June in the Middle States, might be an unalloyed pleasure were it not for the unaccountable habit of

the natives to prefer the middle of the road to walking on the broad sidewalks, and to walk at that, like some automobilists, neither looking to the right nor left and without paying attention to horn signals. Only the rattling clamor of the exhaust will cause them to pay attention and jump aside immediately in front of the car with a curse at the driver. That persons are not killed and mutilated every day in the streets of Rio, is really a wonder and speaks well either for the skill or the carefulness of the chauffeurs, who must be constantly on the lookout.

Another thing which mars the pleasure of the autoing tourist, and of native autoists, too, for that matter, is the fact that the price of gasoline is almost prohibitive. A case containing two cans of less than 5 gallons each costs from 16 to 22 milreis, according to where and in what quantity you buy it. This is a severe drawback to the pleasure, and has, together with the corresponding costliness of repairs, spare parts, accessories, and other supplies, tended to retard the development of motoring and to cause many devotees to again drop the sport after having followed it for a time. The present financial crisis here is also a reason why, for the present, there is a perfect stagnation in trade and sport, and it looks as if there would be no improvement until times get better.

If I have said before that the Avenido Beira Mar offers scenically unsurpassed beauties, I want to modify this statement. I had, for the moment, forgotten, that Rio de Janeiro has in its immediate environs, in the mountains which surround the city on all sides, a driveway the like of which no other capital can boast. Within 10 minutes from the center of the city a narrow but good road winds up Tynca Mountain in hairpin curves and spirals, leading along steep precipices, past cascades and magnificent lookouts, and always at a grade which often reaches 16 to 18 per cent. This road runs for several miles up the Tynca, thence to the Gavia mountain and down again to the other end of the city, through virgin forest dotted only here and there with a little hut or house on the lower altitudes. Its quiet and coolness make it a favorite excursion for autoists, in spite of its dangers, to which a one-track electric tramway, taking half the width of the driveway, adds considerably. My Stoddard-Dayton performed, however, on the Tynca, a trick which very few cars here have so far accomplished. It went up as far as White's Hotel on high speed with four passengers in it.

To reach Petropolis, the summer residence of many Rio citizens and the steady abode of the diplomatic corps accredited to Brazil, is, at present, impossible, although that city is within easy motoring distance. Only one man has so far driven there under incredible difficulties, and that, like the tour to Sao Paulo, to advertise a certain French car.

I venture to say that should an auto road to Petropolis be built, as the government is said to plan, the number of automobilists in Rio de Janeiro would be doubled in no time. I have been told by the amiable president of the Club Automobil Brasileiro, Count de Almeida, an enthusiastic autoist, that the project stands a good chance of realization.

In conclusion I must say a few words of this automobile club which is the only one in Brazil. It has about 200 members, belonging to the best class, and is a well-appointed place for social purposes. Its building contains no garage, however, and serves more as a rendezvous of the motorists who come there for refreshments and a game of tennis. There is plenty of European automobile literature to be found, but of American trade papers I have seen only THE AUTOMOBILE represented.

WHAT THE R. A. C. DUST TRIALS DEMONSTRATED

LONDON, Aug. 7.—The Royal Automobile Club has concluded its dust trials, and their results and the lessons that are to be learned from them are being anxiously awaited. The trials consisted of careful experiments with numerous devices for the investigation of the dust nuisance, and occupied two days at Brooklands racing track, the first day being devoted to the adjudication of the least dust-raising manufacturers' stock cars, for which event there were 25 entries. The second day experimental contrivances were dealt with.

Steam cars, owing to the remarkable lack of dust-raising properties demonstrated by the White and Stanley cars in last year's trials, were barred from the competition proper, and ran *hors concours*. Nearly all the ocular results went to show that, with or without special devices, the dust raised at 30 miles per hour is practically double that raised at 20 miles per hour. Of the various devices, the following are interesting, as showing the various ways in which inventors have set about the dust problem. That of H. Treadwell consists of a patent exhaust suction device. Pipes fitted with four rubber bell-mouthed pieces were fitted to an injector valved off the engine exhaust. Each of these bell-mouthed pieces were carried close to the ground directly behind each wheel. By the action of the injector the dust is sucked through the pipes into a central box, from which it is deposited from time to time in small heaps on the ground Another design was a complete undershield fitted to a Brooke car and invented by Conrad Ingleby. The shield was solid from the front axle up to halfway under the engine, after which point it was perforated for the rest of its length. At the back of the car and just over the shield were two fans, driven from the propeller shaft, and designed to fill the partial vacuum which the passage of the car always seems to create.

Better than this, or certainly its equal, was the performance of the standard 10-horsepower Cadillac, with patent folding seat. This had no other special devices upon it whatever, and its performance was a remarkable one in every way. A 20-horsepower Decauville fitted with Drury-Medhurst tires raised only a small amount of dust. These tires have an additional rim fitted in such a way that the tires only expand longitudinally, not laterally at all, and thus have a constant and narrow tread. A 40-horsepower Napier was fitted with various tires and ran with them time after time over the course. Only the photographs will be able to show the difference in their performances. To the naked eye they were all alike.

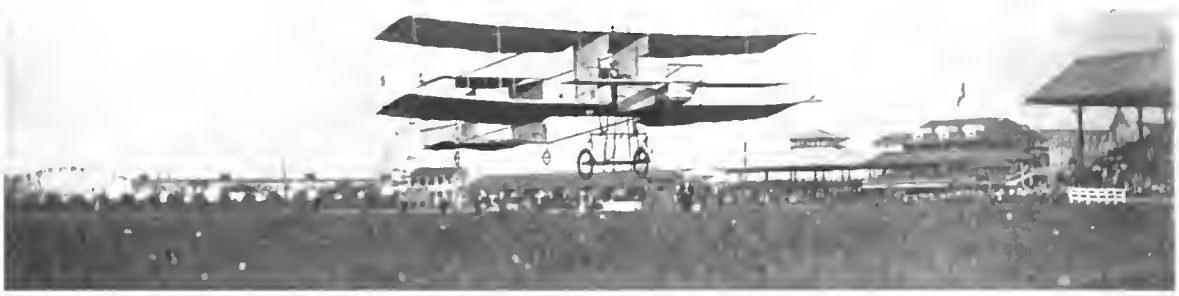
Whatever other lessons have been learned from the trials, the fact that steam cars are better than petrol ones, as far as dust is concerned, has been amply demonstrated. Throughout these trials a couple of steamers ran at frequent intervals and their performances were certainly worthy of notice. Taken on the whole, however, that of the standard Cadillac car is the most noteworthy of the whole trials, and signifies that in one respect at any rate America is ahead of England in automobile design.

SOUTHERNERS MAKE LONG TOURS.

LYNCHBURG, VA., Aug. 9.—Dr. George M. Preston, with his nieces, Misses Charlotte Clark and Jennie Strother, left recently in his 20-horsepower White steamer for a six weeks' trip in the North. They will go through Maryland and Pennsylvania to Bedford Springs, then to Albany and Niagara Falls, possibly crossing into Canada.

ANOTHER 5,000-MILE TOUR IN THE NORTH.

HUNTSVILLE, ALA., Aug. 9.—After making the record of disposing of 747 cases during the sixteen months that he has sat on the bench as Federal judge, Oscar R. Hundley left last week for the East on a well earned vacation. Judge and Mrs. Hundley will be the guests of Hon. Henry D. Eastbrook, of New York, on a 5,000-mile tour through the Northern States.



Henry Farman Making One of His Successful Flights in His Aeroplane at Brighton Beach, New York City.

FARMAN'S BACKERS HAVE BACKED OUT.

Farman and his aeroplane made their last flight in the vicinity of New York last Sunday. On two days of the preceding week the weather was unfavorable, and although the machine performed well on all the other days, business at the Brighton Beach track was far from prosperous. These developments were made public Monday, when it was discovered that the chief promoter of the exhibitions had made a sudden flight in the homeward direction of St. Louis.

T. R. MacMechen, the only member of the original syndicate remaining in New York, said that of the $24,600 which Farman was to receive for a ninety-days' engagement in this country only about $7,500 had been paid him. At the end of last week there was due him a week's salary of $1,680, $800 bonuses for flights and $800 for expenses. Mr. Farman handed in a bill for this sum, and when the syndicate failed to produce the cash, said he considered that it had broken its contract with him. He has not yet made any announcement with regard to his plans for the future.

The trouble seems to have been that the public was not sufficiently educated in aeronautics. So many "sky pilots" have been going about the country with gas bags fitted with bicycle engines that Farman's low, swift flights, although more significant of the future, seemed comparatively tame.

Farman Has Many Offers, But—

Any number of press agents may be found around Mr. Farman's quarters at the Hotel Astor, with their routes all booked and long lists of dates made out, but when it comes to putting up the cash one and all grow suddenly bashful. Monday Mr. and Mrs. Farman went out to the Oranges and visited Edison, who, it is said, made impromptu plans for an aeroplane of his own. Another report is that Farman has offered to sell his aeroplane to the government.

FRENCH AERONAUTS MUST RISE EARLY.

PARIS, Aug. 7.—French aeronauts and their followers must rise early if they wish to indulge in their favorite sport at Issy-les-Moulineaux, the police authorities having decided that the ground shall only be open to them from daybreak to 6 A.M. Although such an early hour has been chosen the sky pilots must have the presence of seven policemen and one subbrigadier, at a cost of $4 per day.

These precautionary measures are the outcome of the closing of the ground by order of the chief of police. Naturally the aeronauts protested at being deprived of the only convenient training ground in the neighborhood of Paris, and protested with such effect that Chief of Police Delpine withdrew his interdiction on the conditions mentioned. Issy being practically a portion of the City of Paris crowds in the past have been too numerous, in the opinion of the police, to render the acronautical experiments altogether safe for the public.

WRIGHT MAKES FLIGHTS IN FRANCE.

LE MANS, Aug. 10.—The French press unites in enthusiastic praise of Wilbur Wright, the Dayton, O., aviator, and his aeroplane. The *Figaro* declares that "this decisive victory creates a revolution in the scientific world." Saturday Mr. Wright flew successfully before a number of experts and pressmen, and Monday did even better. After two false starts, he got away in good shape and covered about two kilometers in one minute and forty-three seconds, causing the machine to describe a figure eight. It is reported that a French syndicate has offered $100,000 for the manufacturing rights for France and her colonies, provided within a reasonable time Mr. Wright makes two flights of fifty kilometers, carrying two persons. Mr. Wright is not likely to attempt to fulfil these conditions for some weeks.

Gastembide and Mengin's Monoplane, "Antoinette II," Flying at Issy-les-Moulineaux, near Paris.

CHICAGO, Aug. 6.—America's first demountable rim contest, conducted to-day by the technical committee of the Chicago Motor Club over the Chicago-Elgin-Aurora-Chicago century course, was won by the Diamond demountable, with a total of 5 min. 36 2-5 sec. for the changing and readjusting of the four rims that were changed by two workmen during the run. Second honors went to the Continental rim, mounted on a Packard roadster, 5 min. 48 sec. being required for the task. Third and fourth places were awarded to Fisk demountables, one set fitted on a Knox four-passenger roadster requiring 5 min. 49 4-5 sec. for original changes and adjustments at the end of the run; and the other set, on a Thomas-Detroit roadster, requiring 7 min. and 10 1-5 sec. for original change and final adjustment. Fifth honors were carried off by the Nadall demountable, 7 min. 35 4-5 sec. being required for the changes and tightening of three attaching shoes which had not been sufficiently tightened when the change was made. The Nadall demountables were on a Pierce six-cylinder touring car.

The object of the test was twofold, to determine first the speed of changing the different rims, four on each car; and, second, to determine the reliability of these rims as could be judged from 100 miles of traveling over dusty, gravel and stone roads at an average pace of 20 miles per hour. The technical committee of the club found it impossible, because of the absolute lack of previous contests of this nature, to take into consideration any other than these two phases of the rim contest, and its awards were based solely on these two.

The plan of the test necessitated the changing of all the rims before Elgin, 42 miles from Chicago, was reached, and the remainder of the trip was to determine if the rims, as placed on, held securely, which was decided upon by a close examination of the rims at the completion of the run, when loose nuts and creeping rims were looked for. Wherever any of these were discovered, the contestants were required to tighten the nuts, and in case of creeping rims to loosen the rim and place it in its original position, which was determined by stamping, with the center punch, the rim and felloe. The time spent in this adjustment, or tightening, at the end of the run was charged double and added to that required for changing the four rims, the total thus obtained being the figures given above.

The quickest change on the road between Chicago and Elgin was made by the Knox-Fisk combination, changing the four rims in 3 min. 56 sec., which is an average of 59 seconds per rim—a good performance, and one which brought out well the quick detachability of the tire as well as the team work of F. J. Moffatt and W. H. Crewdson. This car would have been the winner at the completion of the run had not two of the rims, the left rear and right rear, creeped during the contest, necessitating the jacking up of these wheels, loosening the nuts holding the rims and slipping the rims to their original positions. In this readjustment 31 3-5 seconds were needed for the left rear and 25 seconds for the right rear, adding in all 36 3-5 seconds to the original performance. This time, however, was doubled according to the rules, so that 1 min. 53 sec. in all was added.

The Diamond demountables, which won the contest, were attached to a heavy Isotta-Fraschini car which on the run from Chicago to Elgin got off the route and met the other contestants at Elgin. This departure from the route was sufficient to have disqualified the car, but the other contestants were willing that the Diamond crew should have a chance to do the work and agreed to allow them to make the changes at Elgin. Three of these changes were made in Elgin, and the fourth after leaving Elgin. In the original change the quickest work of the Diamond crew, consisting of William Kesner and George Brewer, was 59 2-5 seconds, made on the right front wheel. The changes of these rims averaged 78 seconds per rim. In the final examination it was discovered that four of the nuts holding these rims had loosened, one on the left rear and three on the right front. In all 12 1-5 seconds were needed to tighten these, which added 24 2-5 seconds to the time.

The Continental rims, fitted to the Packard roadster, made the first change in 1 min. 2 sec., which was the fastest of the four, the workmen, F. W. Sanford and J. Hessler, showing particularly good team work, the results of previous practice. In making the second change, one of them got ahead of the other, with the result that some of the nuts had to be loosened before the rim fitted properly, making the change 1 min. 58 1-2

seconds. The Continental averaged 79 seconds per rim for the four rims in the original change. At the completion of the run, five loose nuts were detected.

The best time made by the Southmayd-Wilcox combination, with the Fisk-Thomas-Detroit, was 54 seconds flat, 4-5 of a second above the record made on the Fisk-Knox. The average time per rim on this car was 60 4-5 seconds per rim. At the final examination, three of the rims had creeped, and in readjusting these the following time was required: 29 3-5 seconds for the left front, 35 seconds for the left rear, and 28 3-5 seconds for the right rear. This added 1 min. 33 1-5 sec. to the original time which, when doubled, made 3 min. 6 2-5 sec.

The quickest change made by Paul Hoffmann and J. Vilas on the Nadall demountable was 1 min. 17 2-5 sec. The average time per rim was 93 3-4 seconds. Changes on these rims were greatly hampered by the use of a ratchet wrench which was worked back and forward, necessitating three movements of the wrench for each complete rotation of the nut. All of the other contestants used the breast wrench which operates the same as a brace-and-bit for boring holes. A further handicap was that this rim carried threaded valve covers, which had to be removed in changing each rim with the exception of one; whereas, the only other contestant to have a valve piercing the felloe was the Continental, and on these valve covers were not used. The two Fisk and Diamond used blind valves, by which is meant the valve in the case of the Fisk came out horizontally through the side of the demountable rim, and in the Diamond the valve stem was cut off flush with the rim, so that in these demountables no trouble whatever was caused by the valves. When the Nadall demountable was given its final examination it was discovered that three rims were in perfect condition and no change had been made in the fourth from the time of its attachment, but the inspection showed that three of the nuts on three expanding shoes had not been screwed up as tight as the others when the change was made, and the technical committee required these to be tightened, there beinf 17 seconds so consumed. When making the original changes but one tool was permitted, but the assistant used a tool tightening four of the expanders. This was in violation of the rules and the committee required them to be loosened during final examination, and time required to tighten them taken.

While the contest took into consideration only the time required to change and the reliability as indicated by 100 miles of road service, the contest brought out many interesting facts relative to the demountable rim, which is very much of an unknown quantity in America. The quick detachability and attachability comprise one factor, and the ability to withstand road work another factor. In detaching the rims the Fisk crews demonstrated with phenomenal alacrity, the No. 1 crew removing a rim in 18 seconds and the No. 5 brigade repeating this performance twice. The Diamond rims were taken off in 22, 39, 46, and 21 2-5 seconds, respectively. The Nadall rim was removed in 35, 37 2-5 and 39 seconds, respectively, the time not being taken for the removal of the first rim. The Continentals were removed in 25 3-5, 26 2-5, and 28 1-5 seconds, respectively, the time not being taken for the removal of the first rim. Time on the No. 1 Fisk-Thomas Detroit for removal were 18, 18, and 21 seconds, and on the No. 5 Fisk-Knox 24, 18 and 18 seconds, respectively.

The rules covering the test called for the following arrangement in the change of each rim, all of the contestants changing the left front rims on the same spot on the side of the road at Addison, the right rear rims on the roadside at Ontariovill:, the right front in the long grass at Bloomingdale, and the right rear in the middle of the road on a street in Elgin. In making the change the car was stopped and the two workmen allowed to place a jack on the ground opposite the middle of the car, to place the rim tool on the running board and lean the rim to be attached against the car opposite the front seat. The two men stood close to the jack. Two timers with stop watches recorded the time, which was taken from the word "Go" until the rim was changed and the old rim, the jack, and the tool back in the position at the side of the car. An observer rode on each car to see that no work was done on any of the cars during the entire run, except at the changing depot.

In looking over the four makes of demountables competing it was noted that on four of them are loose nuts which are taken off and must fall on the ground or be held in the hand while the rims are being changed, whereas on the fifth, the Nadall rim, there is not a loose part that comes off except the valve cover. The Fisk rims are secured by a split expanding rim or ring of "V" cross section which is forced into an opening at one side between the wheel felloe and the demountable rim. The tightening of a set of nuts on bolts passing horizontally through the wheel felloe and the "V" ring, tighten the rim in position. In brief, it is a wedge action, the wedge forced between the inclined permanent and demountable rims by the tightening of the nuts. The Continental principle is the same, except that they use six separate wedges, which are forced between the permanent and demountable rims at one side, there being one wedge for each bolt. In removing these rims all the nuts and the majority of the wedges are taken off, although it is possible by removing half of them to slip the rim over the other half without removing them.

In the Diamond rims are a series of lugs on one side of the demountable which slip over transverse bolts through the permanent wheel felloe and a set of nuts holds the rim in position. In the Nadall rims are six shoes an inch wide and 3 inches long mounted on stems 3 inches in length, which are fitted radially at regular intervals in the wheel felloe. The periphery of these shoes is curved with a slightly shorter radius than that of the inner surface of the demountable rim and in the rim are cut arc-shaped sockets to receive the shoes. The stems of the shoes thread into a sleeve in the wheel felloe so that by tightening a nut on the end of the stem, which protrudes through the felloe between the wheel spokes, the shoe is forced into the socket in the demountable rim thereby anchoring it.

Herewith is the complete summary of the contest:

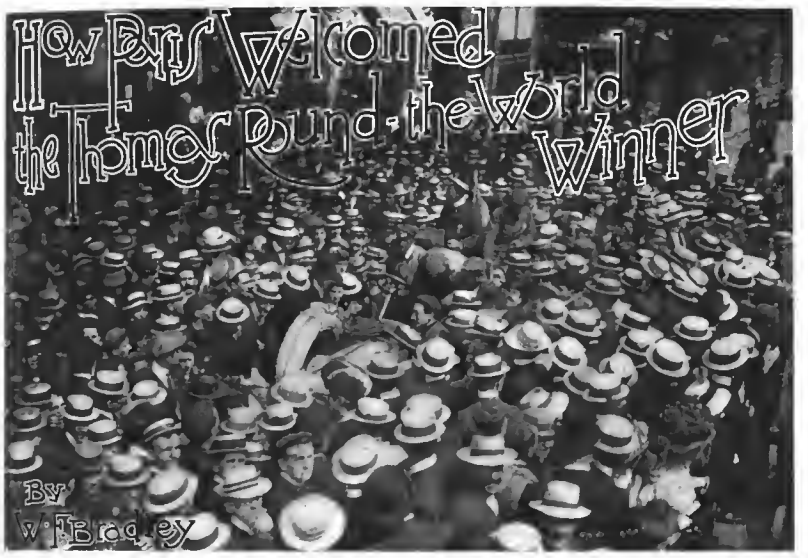
No.	Rim	Car	Weight	Left Front	Left Rear	Right Front	Right Rear	Total	Addttonat (Doubled)	Final Average
4	Diamond	Isotta	4,335	1:02 2-5	1:26 1-5	:59 2-5	1:45	5:12	:24 2-5	84 2-20
3	Continental	Packard	3,230	1:02	1:58 1-5	1:05 2-5	1:10 2-5	5:16	:32	87
5	Fisk	Knox	2,810	1:07 1-5	:57 2-5	:53 1-5	:58 4-5	3:56	1:53	87 9-20
1	Fisk	Thos -Det.	3,040	1:11 3-5	:57	1:01 1-5	:54	4:03 4-5	3:06 2-5	107 11-20
2	Nadall	Pierce	3,955	2:02 2-5	1:17 2-5	1:25 2-5	1:29 4-5	6:15	1:20 4-5	113 19-20

VISITORS SHOULD RESPECT CONNECTICUT LAW.

HARTFORD, CONN., Aug. 10.—Because of the numerous complaints that have been made by members of the Connecticut Automobile Association regarding the recklessness of visiting autoists from outside the State, Secretary G. K. Dustin has written to the various clubs situated in other States near the Connecticut border, requesting that they urge upon their members the necessity for respecting the Connecticut statute, as only in this manner will it be possible to retain the present liberal measure.

PHILADELPHIA AUTOISTS JUBILANT.

PHILADELPHIA, PA., Aug. 10.—Automobilists of this city are rejoicing over the approaching completion of a through road to Atlantic City, on which there can be no objection to reasonable speeding. It is expected that the opening celebration will be held on Labor Day. When finished the road will be one of the finest in the State; there are few sharp curves, and most of the distance is thinly settled. The route lies through Westville, Glassboro, Clayton, Malaga, Downstown, May's Landing and Pleasantville.



PARIS, Aug. 5.—Paris was dozing; it was too early for the theaters, and, although dinner was over, there was no necessity to hurry away from the coffee. The policeman at the corner of the street pricked up his ears, looked down the dimly-lit Faubourg Poissonnière, pulled out his white baton and prepared for action; he had heard the definite note of an open exhaust. But before the baton could get into action the noisy exhaust was joined by a shrill call on a mouth trumpet, a travel-stained automobile swung into the boulevard, and pulled up sharply at the door of the *Matin*. New York-Paris was finished; the Thomas Flyer, America's champion, was victorious. The *Matin* furniture had been wrapped in dust sheets for the night. But the city lived up to its reputation by assembling a crowd at a moment's notice, and the newspaper had the champagne ready to be uncorked when Schuster, Muller, Hanson, and McAdam, the bronzed occupants of the over-freighted looking car, walked upstairs to report their arrival.

When the simple ceremony was over, for the *Matin* had apparently lost enthusiasm and made no pretenee at drum beating, twilight had changed to night, and the order was given to run for Fournier's garage, the last resting place on the long journey. As the car sped down the boulevards, exhaust and trumpet vying with each other for supremacy, a policeman rushed into the roadway and yelled "Les lanternes!" Schuster sped on. One hundred yards further another arm of the law attempted to stop the car. Schuster drove straight ahead. A third and a fourth followed suit, then one bolder than the rest stepped into the roadway, displayed his baton and refused to budge.

St. Chaffray attempted to explain, but the Paris police forec had no more enthusiasm for the New York-Paris victor than official French motordom. The ultimatum was lighted lanterns or the police station. McAdam was for the latter; Schuster had had enough roughing. During the hesitation the pilot, who was running ahead on a bicycle, returned, pushed a way through the crowd, mounted the running board and displayed a light.

"Allez!" and down the boulevard the car shot, to a rousing cheer from the crowd.

Having left New York at noon on Tuesday, February 12, the triumphant Thomas had occupied 169 days 2 hours in its trip of 20,000 miles across America, into Alaska, over the Pacific, across Japan, and through Asia and Europe to the French capital. It is the longest continuous run ever made by automobile, and certainly the most difficult ever undertaken.

Prince Borghese, winner of the Pekin-to-Paris race, occupied 62 days in linking the East with the West. Schuster and the Thomas did the longer trip from Vladivostok to Paris, with a car that had already undergone the rough usage of a trip across the "States" in winter and a journey over mountainous Japan, in 69 days. For the Italian car there was a perfect gasoline supply, fairly good weather, pilots through France and into Paris, and only three men to be carried. For the American car, gasoline had often to be sought in drug stores and elsewhere, rainy weather accompanied the car, much time was lost at the customs and finding the highway from Belgium to France a detour took the car over rough paving stones, instead of the macadam highway which runs into Paris, and, in addition to driver and mechanic, two passengers were carried for the entire distance.

When the official reception took place at the *Matin* at noon on the day following the arrival, there was enough enthusiasm in the streets to keep the policemen busy all the time, but not a sign of any kind that the official automobile world had read of the arrival of the American car. The crowds cheered, struggled for souvenirs, and elbowed one another in their endeavors to find a vacant place on the bonnet for another signature. Those who make, sell, and deal in cars shrugged their shoulders and remained sullenly at home. Nevertheless, if E. R. Thomas, Harry S. Houpt, and John E. Bowles had been in Paris they would have enjoyed thoroughly the "welcome" given by automobile France. Its scantiness told a story that would have been relished by those responsible for the American entrant in the endurance race round the globe.

George Schuster had not changed into a dress suit as he took his first meal in Paris in the fashionable Grand Hotel, for the simple reason that he did not possess one. The four men had four suits among them, and each wore one, the only extras being a few articles of lined stuffed into a small grip. But it was an interesting story of hardship and adventure overcome by pluck and determination that was told in one corner of the dining hall on the night of arrival, interrupted now and again by some visitor who introduced himself as an American, and offered his congratulations as such.

Naturally the American driver was disappointed that the German car should have forged ahead on the last portion of the journey, and was as desirous of giving his explanation as the listeners were of hearing.

Schuster Tells the Story of the Race

"When we reached San Franciseo," said Schuster, "the Protos was being shipped by rail from Ogden, Utah, to Seattle, the rough journey across the States having completely disabled it. We had a lead on the De Dion and the Zust, and on that account, after reaching Seattle went ahead to Valdez, in order to see for ourselves what conditions were in Alaska. It was decided to abandon the Arctic portion of the journey, orders coming that the route should be across Japan, to Vladivostok, then through Asia and Europe to Paris.

"The day I returned to Seattle I met Lieut. Koeppen at the steamship office, where I learned that he had just arrived, and was expecting his car by rail the following day. The Zust, Protos, and Thomas sailed together for Kobe, Japan, crossed the Island of Tsuruga steamed to Vladivostok, and there found the Protos rebuilding under the care of men sent out from the factory. The German spent seventeen days in Vladivostok fitting out; the American spent four; the two cars leaving on May 22, the Protos at 8 A.M., the Thomas at 11 o'clock.

"From this point there was a continual struggle for victory between the Thomas Flyer and the German Protos, the latter finally being successful, thanks to the rebuilding at Vladivostok

and also the excellent manner in which it was handled on the journey through Siberia, as it also met with many misfortunes.

"Japan was a picnic, with a few scares thrown in when the narrow, flimsy bamboo bridges had to be crossed, and some strenuous calls for the low gear on the mountain passages. Nevertheless, the kindly hospitality of the natives caused forgetfulness of all the difficulties, leaving only the memory of the good time spent in crossing the land of the little brown man.

"The trouble began when Vladivostok was left behind. The roads were not any worse than in America, but when at home we could always count on food and a clean hotel at the end of a journey. In Manchuria and Siberia there was neither, the hotels being bug-ridden hovels that made one glad to sleep on the veranda, in stables, in wagons, on the ground; anywhere, in fact, but under the roof of a house. Food was as bad, the staple article of diet apparently being a coarse black bread, the crust of which could be eaten, but the inside of which was absolutely indigestible. Eggs could be obtained sometimes, tea always, coffee never.

"Rain accompanied us when we left Vladivostok and remained with us for eighteen days in succession. At that time we had not taken to the railroad track, but were endeavoring to push along over the soft, boggy country. On the first day we covered twelve miles, the second about the same distance, and the third a little less. Before we were many miles out of town we overtook the Protos, stuck in the mud, pulled them out by means of a tow line, and left them.

"After three days' traveling we reached Nikolsk, went on the railroad track—although permission had not then been accorded—but when 100 versts further on stripped our bevel gear and had to lie up for repairs. The Protos, coming along slower, received our permit for traveling on the track, and in this way saved itself a long grind through the mud. There were places where traveling on the railroad was good; there were other spots where it was so shaky that I thought my teeth would drop out of my head. The ties were not sunk, but each one raised a considerable distance out of the ground and just wide enough apart for the wheels to drop in between them with a thud and be pulled out again with a jerk. Our first accident happened on a curve where the ties were just sufficiently close together to allow both front and back wheels to drop in together and remain locked. In the fearful wrench which the car received the bevel gear stripped.

"There were some narrow escapes with trains, and at one time the withdrawal of permission to use the track, owing to the Protos having held up the express for four hours. After passing Kharbin, in Manchuria, where we left all the clothes excepting those we stood in, with orders that they should be shipped to Paris, we had some rough traveling, during which we stripped the second speed gear. A spare was telegraphed for, and I went back to Kharbin to get it. It failed to arrive, and I returned to the car to find that in the meantime Muller had put in a couple of stumps to replace the missing teeth. With this makeshift repair we continued, after ordering the spare part to be shipped ahead to Omsk.

"Later our repair broke down, and in order to get the spare part I had to travel 658 versts by relays of teams, a journey that was done in four days by changing teams every 90 versts. There was a reason for the hurry, the Protos then being in our rear, but rapidly drawing up. I wished to get back and make the repair before they caught us, but was not able to do it, the car passing me when I was within but a few miles of the end of the return journey. I reached the car at 1 o'clock in the afternoon; at 4 o'clock we were away again.

"At Moscow we were held up for one day by repairs to the clutch shaft, and again after leaving Berlin lost some hours doing the same repair work."

"And how did the motor stand it?" inquired one of the listeners.

A smile spread over the face of the driver as he replied, with justifiable pride: "Perfectly; we dismounted it at Chicago, in order to verify the main bearings, put in a new set of spark plugs that somebody gave us, and have not touched anything since. Even the spark plugs are there, as good as on the day they left Chicago, and that is saying a great deal."

"How were supplies of gasoline and oil arranged for you?"

"There was supposed to be a complete train of gasoline stations across Siberia," replied Schuster, "the arrangements being in the hands of the person who supplied the Pekin-Paris contestants last year. Unfortunately they were not perfect this time, the gasoline sometimes being there and sometimes being entirely absent. When the supply failed, it was our business to search round town until we could find any; not being certain of the next stage, we frequently filled the tank of the car and carried a reserve supply with us in large bottles, each man holding a bottle on his lap, there being no room for it on the floor.

"Right from Vladivostok to Moscow the order was to push ahead as fast as possible. We had no need for lanterns, for a gray light lasted until 11 o'clock at night, and it was daybreak again at 3 o'clock. When Nijni-Novgorod was reached our difficulties practically ended, for we struck roads that in comparison were so good that we imagined we were on feather beds. We had to pay duty entering Germany, and on leaving the country had to visit three different towns before the amount was returned to us. Ten minutes after we got it we had to hand it out to the Belgian authorities, from whom we were reimbursed on the first request. Finally, entering France on our last day's run from Liege, 1,113 francs had again to be deposited as duty on the car. Getting near Paris we missed the road, and, instead of the macadam highway, had to travel for a considerable distance over rough granite *pavé*, that cut down our speed considerably. Though there were so many roads to Paris, nobody on the route appeared to know which was the good one."

"How were you treated along the way?"

"Well, there was no hostility anywhere, if one can regard the attacks of insects as non-hostile. We have all a lively remembrance of the thousands of creepers that attacked us in some of the Siberian hotels, where cleanliness was an unknown quantity. In one German town the landlord of the hotel looked us over when we asked for a dinner, then led us away to the servants' quarters. We forthwith removed over to the rival establishment on the other side of the street and were royally received."

"What about Alaska?" queried somebody.

"Time to think about that when airships are perfected," exclaimed Captain Hanson.

"There was as much hardship on this trip as any of us desired," exclaimed Schuster. "At times I doubted whether any car would get through. Now that we have finished, we are glad that we have got first place for America. We have been running on three hours' sleep per night for so long and have had so little acquaintance with real beds for the last four months that I doubt if we shall be able to sleep to-night. I suppose there is a bath upstairs and we will try what hot water and clean sheets can do, anyway."

"Good-night!"

This Picture Was Taken After Arrival in

CONCERNING THE ELEVENTH YEAR AUTOMOBILES

By THOS. J. FAY, President Society of Automobile Engineers.

IT has been freely predicted all along that as the result of improved methods of construction, much cheaper materials and well-developed factory organizations working on a large scale, it would be possible to produce a good automobile to sell at a fraction of the prices which obtained a few years ago and also be able to turn out a vehicle that would be superior in every respect to the cars of that time. In 1905, not to go any further back, that day seemed to lie in the indefinite future, but now, in view of the announcement of a number of makers who have already laid their plans bare for the coming year, it appears to be close at hand, if indeed, it is not already here.

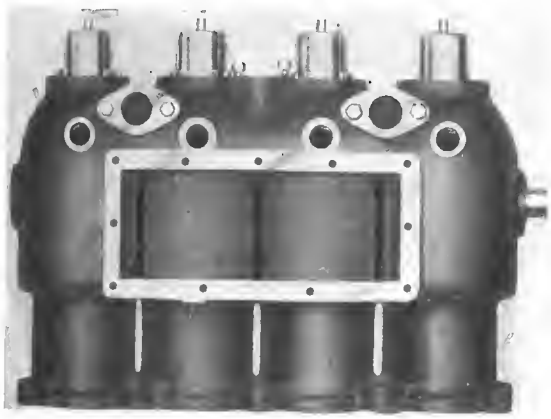


Fig. 1—Block Casting of the Chalmers-New-Detroit Motor.

To truly appreciate the situation as it will obtain for 1909, it will be necessary to go back a pace and review the history of the industry. In the early days inventors were struggling with the problem, just as inventors invariably do, in secret and in dread, fearing on the one hand the invention would not work, while on the other hand their secretiveness was enough to keep honest capital "in the next county." These were the days of original ideas, freakish designs, doings in a small way, and a conglomeration of the good and the bad. Times change, and, with time, things change. The next step in the chain of events was most conspicuous for the selection of the good points from the 57 varieties.

If it is true that the cars of the eleventh year will be generally superior to the cars of the past, it is also true that the reasons should be no secret. A secret is an embryo idea, as a rule, while the cars of the eleventh year are cars; in fact, they can be seen on the road, and there are thousands of them being constructed at the present time.

That the purchase price of these cars will be low, quite as low as the author has had the temerity to intimate, it can be adequately substantiated by merely citing a few instances in crystalline form of some of the 1909 models:

E-M-F	30-horsepower	$1,200
Cadillac	30-horsepower	1,400
Kisselkar	30-horsepower	1,500
Chalmers-Detroit	30-horsepower	1,500
Overland	30-horsepower	1,500
Rambler		1,900
Jackson	30-horsepower	2,000
Mitchell	35-horsepower	2,000
Selden	35-horsepower	2,000
	30-horsepower	

This list is not intended to convey the impression that there are no other cars in the class. As the author is able to pay attention to the other cars, he will take them up, with a view to displaying their merits. Nor is it intended to overlook the existence of the larger and more expensive cars, or that great improvements have been made in them. It is well known that they represent far greater value for the price than ever before. The gist of the present discussion takes into account the cars at the lower prices only.

In What Are the New Cars Conspicuous?

First and foremost, the new cars are conspicuous for the entire absence of elaborate body work. We can no longer expect to see a $1,200 body on a car costing no more. But the new body work is neat and strong, and its comfort is by way of a fact rather than as a theory. In body work the idea of aluminum in fancy shapes and in fantastic configuration, backed up by a thick lining of plaster-of-Paris, that the whole may be stronger, will no longer obtain. Plain, straight work affords strength, with grace and lightness besides. It is not that aluminum may not find a place in the simplified bodies of the cars in question, for aluminum there will be when this product will best serve the ends to be sought. Body work in the simple form it has assumed, in this same age of the automobile, is free from the contortions to which aluminum so adequately lent itself. The idea that the aluminum bodies were lighter than those made otherwise has long since been exploded. The cost of the body and the cost of keeping it in presentable form will be but a small part of what it has been. In the past the body was the important part, important because it was the only part, perhaps, that many of the patrons could pass judgment upon, and it is no stretch of the imagination to observe that the "seventeen rubs of varnish" had a lot to do with the acceptability of the whole. Time tells the tale, and time, in this case, tells the user that what he needs is good machinery, plain body work, and, above all, a power plant that will survive strenuous service. What has experience taught?

Once designers are convinced of the genuineness of the conclusion that self-contained power plants constitute all to be desired, it does not take them long to put their conclusions into practice. Users of cars can choose for themselves as to the details more nearly according with their ideals, but the same users will probably decide that the

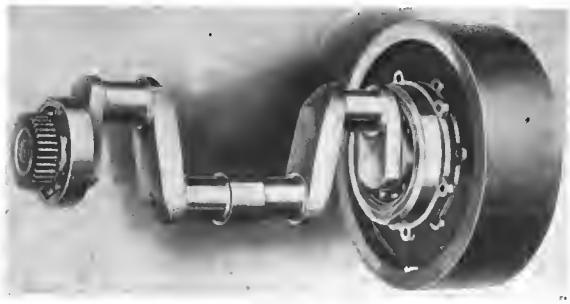


Fig. 2—Chalmers Two-Bearing Crankshaft Complete.

chassis frame of an automobile is too unstable as a platform on which to erect the machinery in subdivided units, if there must be any interrelation. There are two plans in advancing the idea of doing away with the chassis frame as the connecting member between related parts of a unit, or as between units that must work in unison. If alignment is essential to the good of the whole, that alignment cannot be fairly expected if the chassis frame is to be responsible for it.

In the earlier work it was the chassis frame that was depended upon to insure alignment between the motor and the transmission. When it was found that reliance could not be placed upon the frame, designers sought other means, such

as the self-contained power plant and the transmission axle. Both of these methods give assurance of the fact that the chassis frame will not render the machinery *hors de combat* should a sag follow a little hard usage. A sag in the chassis frame is a natural sequence of the use of the car in almost every instance, because until the sag does take place the metal is not in a state of tension. If this condition of tension were not to be anticipated, there would be no need of a frame; at all events, so much frame as is our wont to provide for an automobile under prevailing conditions of design.

No matter how great the section of a beam or a member of any sort, if it is loaded, however small the load, the result is a deflection. In the modern self-contained scheme of construction, there are no related parts that can suffer as a result of deflections because there are no

Fig. 3—Simplicity of the Chalmers-Detroit Control.

members intervening that (*a*) are of any notable length; (*b*) that would have to be used of such light section as a chassis frame; (*c*) that are subjected to the strains incident to road conditions.

As before stated, no matter what the section or the material, or no matter how small the load, a deflection will obtain. If this is so, how necessary it is then to be sure of a definite limit to the causes of the deflection and that the length of the member be, say, 10 inches, instead of 100 inches?

Obviously the self-contained construction is the form that renders it possible to avoid the greater of the two deflections. If it is possible to get on at all with the greater tendency—and it seems to be—what a gap lies between trouble and the man who puts his money in a self-contained plant from this point of view. There are so many ways of courting trouble that it is not necessary to find it by way of considerable deflections in a long beam. The repair man cannot fix a chassis frame that sags. He may charge for attempting to accomplish the task, but it is the same frame in the same car with the same fundamental difficulty ever present, awaiting the moment when it will assert itself.

Modern Construction Less Expensive.

Fortunately, the modern construction is less expensive to evolve than the way we were taught by the "foreign contingent," whom we must hold responsible for the "distributed components of cars." Even in the matter of repair parts, the policy is one sure to advance the industry as a whole by leaps and by bounds. Ford, for instance, will sell all the parts that go to make a car at the price of the complete car. Who can find in this any sign of the old adage that "In repair work we have legitimate prey." That the Ford is not an isolated case is evident from the following:

Fig. 1 shows the four cylinders *en bloc*, as put out by the Chalmers Detroit Company. The set argument against this method of cylinder construction is that the four cylinders *en bloc* are very costly, and if something happens to one of them four must be purchased to make the replacement. But in this case the four cylinders will be replaced for the sum of $35—less than half the cost of a single cylinder in a well known foreign car. Who would refuse to have all the cylinders of his motor replaced at less than half the cost of replacing one?

Of the details of construction of the cars of the eleventh years space will not admit of the mention of more than a few. It is understood that no mention will be made of old and well-known methods, except in the light of new applications.

Fig. 2 illustrates a crankshaft with only two bearings, the motor being of the four-cylinder type. Usually such motors have at least three bearings and many of them have five. At the first jump out of the box many will say: "It is wrong." Obviously, we could not get on with one bearing, but fortunately it is not necessary to try, nor could we do with two, unless the length of the crankshaft be short enough to bring its deflections within the limit experience shows will be safe. As said before, the deflection (considering the crankshaft as an abstract beam) is in proportion to the cube of the length. Let us see what this means in a comparison of two motors, the one of to-day and the other of but a short while ago.

In the modern motor with two bearings the distance between them will be, say, 23 inches. Let us assume also that the strain will be proportional to the square of the diameter of the cylinders, and that in the modern motor the bore of the cylinders (for the same power) will be 64 per cent. of the bore of the cylinders of two or three years ago.

Let us say that in the earlier motors the distances between bearings was 20 inches. Now, let us make a rough comparison, thus:

In the three-bearing motors:
The strain $s = 100^2 = 10{,}000$.
In the two-bearing motors:
The strain $s = 10{,}000 \times .64 = 6{,}400$.
In the three-bearing motors:
The cube of the length = 8,000.
In the two-bearing motors:
The cube of the length = 12,167.
In the three-bearing motors:
Factor of deflection = 80,000,000.
In the two-bearing motors:
Factor of deflection = 77,828,800.

In other words, the two-bearing crankshafts of to-day are not required to work as hard as were the three-bearing motor crankshafts of yesterday. But that is not the whole story; the three-bearing crankshafts did work, notwithstanding the inferior nature of the steel then in common use. The steel of to-day is very much superior to that of a short time ago; that is, the steel that an automobile engineer will contemplate using in a product of any consequence at all. Thus the steel is better and the strain is less. The method of approximating the results is simplified in order that the non-technical will be more likely to understand the nature of the problem and the accuracy of the conclusions. The idea is not to convey the impression that only two bearings should be used in every case, or that it is a crime to use three. What we wish to show is that hasty conclusions are out of place in a matter of this sort and that time renders matters clear. It is proper to add, however, that it is a decided advantage to have a short motor, because then something besides the motor can find space in a car of a length capable of maneuvering on an ordinary roadway.

The main point to be made is this: Are the cars at the

low prices to be inferior to the cars of the past costing double or even treble the price of the new product? How shall this question be answered. Refer to Fig. 3 and observe if the space is cramped, if the scheme is not clean cut, and compare this with other products of the past to determine if there has been any retrogression.

Fig. 4 shows the details of the steering gear and its related parts; note the depth of the front end of the side frame; see the wealth of bearing surface provided for the steering members; observe that the means for oiling are adequate.

Fig. 5 shows a car upside down. What product in the past exhibited a cleaner bottom? Wherein lies the retrogression? The author fails to note even a tendency; indeed, may we not say this tendency is in the direction of improvement?

It may be said the new cars are smaller, but with the present short motors and a wheelbase of, say, 110 inches, it is a question if the new product will not afford more available space. It was not by curtailing then that the new product was rendered low priced. Suspicion is prone to run rampant, and it follows that all courses of cost reduction must be explored ere the situation can be accepted without a struggle. Did they reduce the sizes of the wheels? In many instances the sizes were actually increased over the practice of the past, and in no cases are the tires below the sizes recommended by the tiremakers.

The man who has to pay for the tires, however, never would have arrived at the right conclusion, since the man who sees through a dollar is as blind as a bat. It is the man who gets his line of vision on another man's dollar that can tell how big the tires ought to be, and even he may fall short of nerve equal to the occasion. At all events, the low cost of the product to be placed before the 1909 public was not rendered low by stinting the tires, which is more than can be said for some of the cars of the past.

If the cars are big and roomy, if the work bears all the earmarks of a high standard, if there has been no retrogression in the matter of style and finish, since the price is so low, there are those who will say: "The materials must be very bad, indeed."

How About the Quality of the Materials?

Actually the materials will be better, far better than they ever were before, no matter what the price of the automobile, and for the same reason that the price of the automobile can be lowered. The most inferior materials of to-day, entering into automobile work, are superior to the best to be had but a few short years ago. What we have to-day are not high-priced special products to be used sparingly in a few spots to give the press agent a chance at his stock phrases. We have to-day a good average product, the worst of which is not so high-priced as to require a nerve tonic with every pound purchased. In the earlier days, engineers relied upon the vendors of the steel, and sometimes they were safe in doing so, but the occasions when they failed to get the right material were frequent enough to keep them in hot water almost constantly. Then the purchasing agents of the automobile companies were not skilled in the matter of the quality of steel, and to them price was the whole story. Bessemer steel was very low in price, and Bessemer was what they "landed" every time.

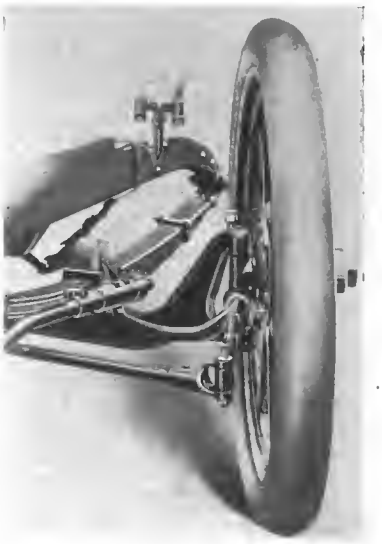


Fig. 4—Suspension, Front Axle and Steering Knuckle Assembly.

The Present Plan of Building.

To-day the situation is quite different in that the makers of cars pay quite as much attention to the quality of the material as the occasion requires, but they pay more attention to the question of where to put the several grades of available product. The proper way to put it, then, is to say "appropriate materials" are the order of the day.

Referring to materials, it is not at present the idea to start with highly resistant materials (normally highly resistant), for such products are over costly; moreover, they resist

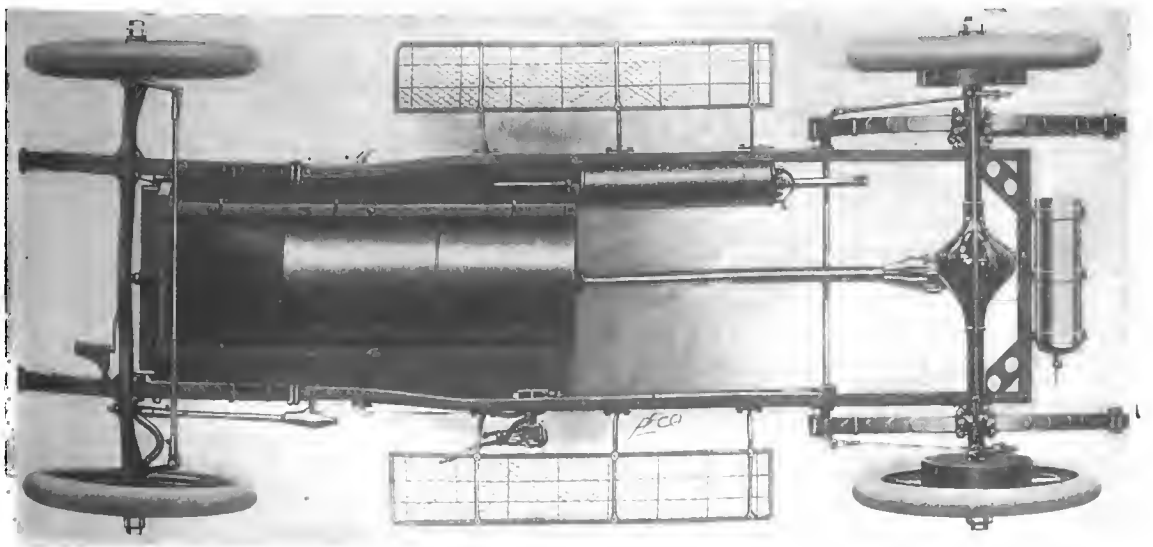


Fig. 5—Clean Lines of the Underbody of the Modern Low-priced Unit Construction Type of Automobile.

machining with a tenacity that is scarcely equalled by their after performance. The current idea, which is the idea that will survive for 1909, takes into account the fact that certain materials are capable of being rendered hard or soft, dynamic or ductile, or both, and initially the same materials are soft enough to machine. These materials when fashioned into the desired shape, leaving a few thousandths to permit grinding, are then ready for the heat treating process through which they are rendered fit. In the normal state, the steel may not show such good qualities as one would want, while in the finished state the parts will exhibit just the characteristics most desirable in view of the duties of the parts.

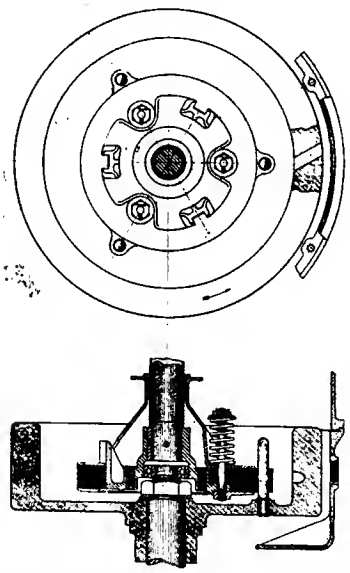


Fig. 6—Plan and Section, Chalmers-Detroit Multiple-Disc Clutch.

Take crankshafts, for illustration; they are costly when they are "slabbed," and it is true the slabbing process cuts the lay of the fiber, leaving less than would be desirable in the finished product. To get away from the cost and the defect, the shafts are die-forged of relatively soft material, by a process such as will not bruise the steel or otherwise leave it in such shape that the after heat-treatment will be futile. The die-forgings thus made are easy to fashion into shape ready for the grinder, which device takes off the final thousandths. Before grinding, the shafts are heat-treated, to render them rigid and dynamic, qualities needed in crankshafts.

Now, there is no known material of a greater modulus of elasticity than the material used in this work. It follows that there is no material that will permit of the use of less, since the torsional angle will be the minimum in the shafts as made. If the torsional angle is thus a minimum, it is fair to infer that the deflections on the whole will be as low as possible. If this is so, the mean of dynamic ability will be in the shafts as made, yet it is the purpose of the heat treating process to accentuate this one property to the greatest possible extent. Crankshafts thus made cost probably one-third of the cost of the crankshafts of the more resistant alloy steel, and so it may be said the cost of the replacement will be very low in comparison. Even so, it does not of necessity follow that the breakages will be more for the initially soft material, because, as before stated, the modulus of elasticity is the maximum possible of attainment in the materials used. It is desirable to be able to replace a crankshaft at small cost, and it cannot be said that the present plan is merely cheap at the expense of merit. What is true of crankshafts is equally true of the other parts.

It is desirable to note the absence of castings in the parts that can well be of die-forgings, showing that the cost of dies is a matter of no moment, now that cars are turned out in large quantities. When cars were built in small numbers, the die problem was uppermost, and resort was had to castings to sidestep the cost. Most of the cars are provided with transmissions with three speeds and reverse, using the sliding gear principle, which, in spite of its mechanical incongruity, seems to be the best all around method. The gears are of ample proportions, and the materials are usually alloy steel.

In the cars in question, it is agreeable to note that the wheels are better than they ever were before, with better proportions of the spokes, and hubs that are more dependable. The question of bearings is one that has settled down to well and favorably known types of ball and roller-bearings, with never a thought of going back to the earlier types of plain bearings. Of the ball-bearings, the annular has the call, whereas the roller-bearings are largely of the Timken and Hyatt types now so largely specified in automobile work.

In the cars for 1909, the magneto is looked upon as finality as the device for the ignition. There are, of course, several makes of magnetos, each of which have their adherents. Magnetos are not provided in every case, except as an extra. Purchasers can best settle for themselves, if they will buy the cars with magneto at the regular price, or if they will select the other cars and pay extra for the magneto. The author thinks they should adopt the magneto even as an extra.

The clutch question in the new cars is more secure than it ever was before, and while all are not multiple disc types, all are far more reliable than they were. Fig. 6 illustrates clutch simplicity, and there are few of us who will fail to remember the complex schemes of the past. It is a source of much delight to observe that the new crop of clutches are primarily strong, yet withal simple in extreme. The clutch illustrated is of the multiple disc genus, of bronze and steel alternately, with the discs of considerable number, and enough of them to do the work without showing wear. In this case, instead of the clutch being housed in, the whole flywheel with the clutch are in an oil-tight housing and the oil is distributed to the clutch by the flywheel.

Brakes, fortunately, are well thought out in all the cars of the future, but special mention is due to those of the builders who avoid the use of facings that will not stand the heat and wear. The "Thermoid" idea is taking hold of such builders as will pay the price, and, in view of the heat-resisting ability of such materials in view of their high coefficient of friction, the brakes should cease to be a source of annoyance, as they were so prone to be in the past, a point which indicates that the new cars are not of low quality as a result of low price.

In conclusion, it may be said that the whole undercurrent of this article is to convey the impression that the cars of the eleventh year generally are the best cars that the builders ever turned out, and are turning out in large quantities, in order that the price will be very much lower than it ever was before. Later on the idea will be to discuss in detail the parts of the several cars, with the idea of showing in what manner they are entitled to the confidence of present and prospective purchasers of the eleventh-year automobiles.

LARGER PNEUMATICS MEAN MORE MILEAGE.

Experienced motorists know that a tire a size larger than that required, according to the "recommended weight" which a tire should support, will carry him from three to five times as far as the tire with which his car would ordinarily be equipped, says the *Rambler Magazine*. There are several reasons for this: The "recommended weight" of the manufacturer is the weight which that tire can carry without overloading it or subjecting it to destructive strain. Any increase over that "recommended weight" means trouble a short ways ahead. It means the same as a steam boiler made to withstand 200 pounds pressure to the square inch being run continuously at a pressure of 250 pounds or more. The result in either case is quick destruction—trouble—expense.

Take for example a 30 by 4 tire. The "recommended weight" is 550 pounds per wheel or 2,200 pounds per car, which is figured to include the normal load which that car should carry. Thus, a 2,200-pound car containing five people weighing 150 pounds each (the normal load) would put every pound of weight on a 30 by 4 tire which it can carry without overstrain. It is then carrying every ounce it should up to the limits of safety. It is a boiler tested to 200 pounds with 200 pounds of steam up.

ADVANCE IN AERONAUTICAL MOTOR BUILDING

By W. F. BRADLEY.

PARIS, Aug. 5.—While it is the automobile that has made aerial navigation possible, the flying machine is seeking to repay its debt by providing us with lightweight motors. Steam as a motive power for flying machines has too many disadvantages to have ever been proposed; electricity has been used, but owing to the excessive weight of storage batteries and dynamo, has never been found really practical, and now that the internal combustion engine has reached such a degree of perfection is no longer a serious rival.

The defect of the automobile engine, the lightest of all power plants available, is its weight. Built for the road or

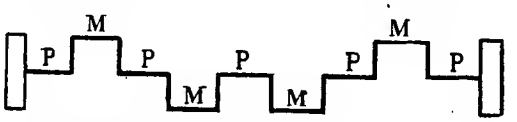


Fig. 1—Arrangement of Four-Throw Crankshaft for Antoinette Eight-Cylinder Engine.

for marine work, a few pounds additional weight were of very little importance; it was only when flying machines began to force their attention upon us that the necessity and possibility of reducing weight were realized.

In France, where more experimental work in connection with aeronautics is being carried on than in any other country in the world, automobile manufacturers have realized the necessity of lightweight engines for flying machines and gliding boats, and in the belief that aerial navigation is destined to become a serious factor, have produced special gasoline engines to meet this demand. It is certain that experimental work in this direction will have its effect on the automobile of the future, and that the engine in general use a few years hence will be considerably lighter for a given horsepower than is generally thought possible to-day.

To reduce weight in an internal combustion engine the best method is to increase the number of cylinders. It may seem paradoxical at first sight, but it is nevertheless true, as is proved by the fact that of the seven or eight types of engine in use for aeronautical work all but one have more than four cylinders. Levavasseur, the designer and builder of the now well-known Antoinette engine, did most of the early experimental work with multiple-cylinder engines, and now stands forth as the most prominent of the small group of engineers building specially for aeronautical work. It was some five or six years ago that Levavasseur, then occupied with aeronautical experiments, sought a lightweight engine on the French market and found none. He designed and built an engine according to his own ideas, attempted to interest the public and the government, was ridiculed by both, and in order to attract attention to his product turned for a time to motor boat racing, where his lightweight engine gained world's records. Now he is back to the air.

The smallest Antoinette engine is made with eight cylinders; the largest with 24, this latter being practically a group of three eights. By adopting eight cylinders as the minimum for aeronautical work, Levavasseur was able to discard the cumbersome and weighty flywheel hitherto considered indispensable on a gasoline engine, and by reason of the more even torque to make a reduction in weight that had not previously been attempted. The abolition of the carbureter, a distinctive feature on the Antoinette, can hardly be considered as an anti-weight device, the pump and direct injection arrangement doubtless being but little less weighty than a specially designed carbureter. In design, therefore, the Antoinette only differs from the engines already used for automobile work by the number of cylinders and the absence of a flywheel. In constructive methods, however, there is a decided difference, every part showing signs of the desire to save weight wherever this could possibly be accomplished.

The eight steel cylinders, with copper water jackets and aluminum heads, are mounted in V on an aluminum crankcase having the form of a triangular prism. Exhaust valves, on the inside of the V, are mechanically operated, while the automatic inlet valves are in the head. It is worthy of note that of all the aeronautical engines of any importance the Antoinette is the only one that is water cooled. Though the air-cooled variety is first in point of numbers, the Antoinette water-cooled type has the position of honor in success achieved, being used by both Henry Farman and Léon Delagrange in all their record-breaking flights. Between the Antoinette and the water-jacketed cylinder familiar to automobilists there is an enormous difference, the former being but a thin steel cylinder bearing a still thinner copper jacket, having all its parts machined to a thousandth part of a millimeter wherever the metal is not necessary for strength. Connecting rods and crankshaft, like the pistons, are of steel, and are bored out to reduce weight. The crankshaft has four throws arranged at an angle of 180 degrees, the two end ones and the two center ones being in the same plane; there are thus two connecting rods to each throw. The shaft has the further advantage of possessing a bearing between each throw. In the matter of lubrication the distinctive feature is the use of a gear-driven pump drawing the oil from the base of the crank chamber and driving it through a copper tube within the upper portion of the crankcase and pierced with numerous holes through which the lubricant is squirted with considerable force onto the moving parts below. To provide for a supply of oil in whatever position the engine may be placed—a state of affairs which must be considered in aeronautics—the crankcase is divided transversely into four compartments. Thus splash and force feed are constantly provided.

The distinctive feature, however, of the Antoinette, apart from the remarkably fine machining which its construction entails, is the absence of a carbureter. Gasoline is drawn from the tank and by means of a gear-driven pump is injected direct into each cylinder. The pump, driven off the camshaft gear, is so constructed that the stroke can be varied at will, thus regulating the amount of fuel sent through to the

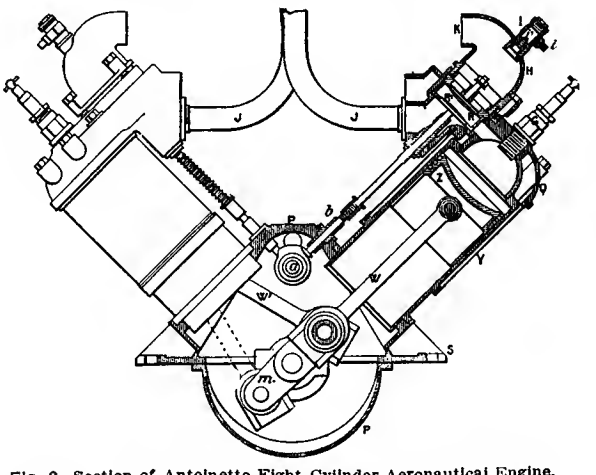


Fig. 2—Section of Antoinette Eight-Cylinder Aeronautical Engine. Z Piston; R Automatic Inlet Valve; R¹ Mechanical Exhaust Valve; K Air Inlet; J Exhaust Manifold; A Camshaft; Y Copper Water Jacket.

Fig. 3—Fifty-Horsepower Eight-Cylinder Antoinette Engine Mounted on Aeroplane to Drive Two-Bladed Propeller as Shown.

cylinders. Each cylinder carries its own distributer regulating the amount of gasoline necessary for each explosion and storing it during the three strokes other than that of aspiration. Levavasseur is of opinion that direct injection is the only possible method of obtaining an even distribution of the charge on a multiple cylinder engine. Ignition presents no distinctive features, storage batteries and single trembler coil generally being employed, but high-tension magneto being fitted where desired.

The eight-cylinder 50-horsepower engine, with a bore and stroke of four inches, weighs complete 154 pounds, the 80-horsepower engine weighs 350 pounds, and the 120-horsepower model scales 440 pounds. The 80 and 120-horsepower models are 16-cylinder engines. Generally for aeroplane work no radiator is used, a small tank being carried on the top of the apparatus and connected with the engine by means of suitable piping. Now, however, that the sky pilots have made progress and can stay aloft for more than a quarter of an hour, a radiator has been designed and fitted to both Farman's and Delagrange's machines. For the eight-cylinder engine the radiator weighs but 20 pounds.

Big Auto Constructors Studying Aero Engines.

Renault is the first of the large European firms of automobile constructors to produce a lightweight aeronautical engine. Excepting that the cylinders are air-cooled, the general arrangement of the engine is similar to that of the Antoinette just described, and consequently has nothing in common with the well-known Renault car engine. All valves are mechanically operated by a single camshaft, the exhaust velves being overhead and operated by rocker arms, and the inlets below. The spark plugs are fitted just over the inlet valves and project into the angle formed by the two rows of cylinders. The carbureter and all ignition wiring is also brought up into this angle, the motor thus having a remarkably clean-cut appearance. Naturally the flywheel has been abolished, and as in the Antoinette there are two connecting rods to each throw of the crankshaft. Only one model of engine has yet been produced, which with a bore of 3.5 inches and a stroke of 4.7 is rated at 45 horsepower at 1,500 revolutions per minute.

Distinctive in the Renault cooling arrangement is the use of two large ventilators, the one at the forward end of the engine drawing in cool air and the one at the rear driving it out after it has passed around all the cylinders. As the engine is covered by a sheet-metal hood, and the fans themselves revolve in a light cage, the current of air is considerable and is declared to be sufficient to keep the engine cool under the most disadvantageous conditions. In principle the ignition and carburation have not been radically changed from those used on the touring cars. Naturally, lighter material is employed wherever possible, but the design is the same. The Bosch magneto is mounted in a reverse position under the forward extension of the crankshaft, the carbureter is carried centrally between the two rows of cylinders and lubrication is assured by a force feed pump similar to that on the cars. Fully complete with carbureter and all ignition apparatus the Renault engine is declared to weigh 310 pounds. No public tests of the Renault engine have yet been made, though one is fitted to a new aeroplane being built by the Voisin Brothers.

New Principles in Aero Engine Design.

Despite the absence of a flywheel and carbureter and the increase in the number of cylinders, the engines described do not materially differ in principle from those employed generally for automobiles. There are a small number of constructors, however, who have sought to decrease weight not by the suppression of a flywheel and the paring of the metal at every possible point, but by entirely new design. Foremost in this school is Robert Esnault-Pelterie, who has produced a seven-cylinder air-cooled engine without flywheel, with but a two-throw crankshaft for the whole seven cylinders and a single cam for all the valves.

Without entering minutely into the genesis of the engine, it is interesting to note that Robert Esnault-Pelterie set out to design a multiple cylinder engine, the cylinders of which, of an even number, would be placed at equal distance around a circular crankcase, the pistons operating a one-throw crankshaft. Theoretically it was impossible with this arrangement to obtain the firing of the cylinders at equal intervals, and practically it was impossible to efficiently lubricate those cylinders having their heads downward. The result was the

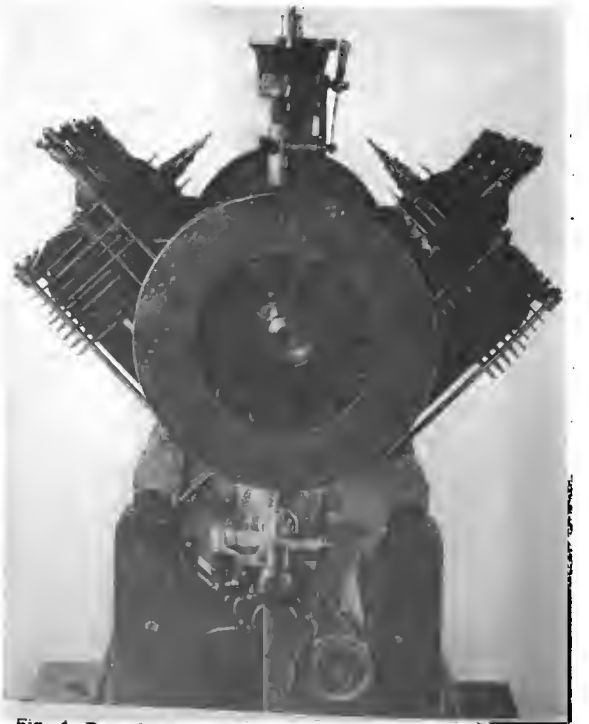


Fig. 4—Renault Eight-Cylinder Air-Cooled Aeronautic

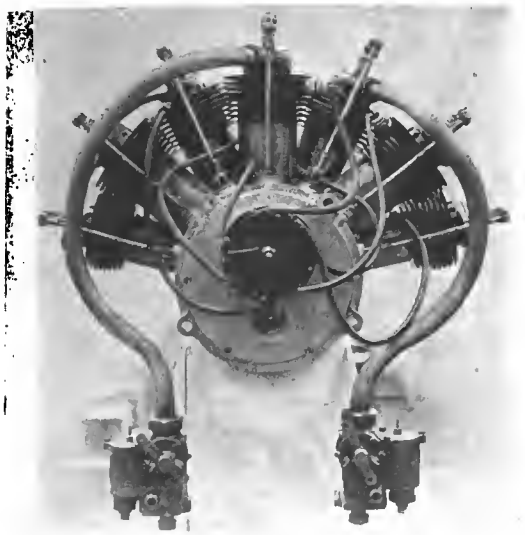


Fig. 5—Esnault-Pelterie Seven-Cylinder Air-Cooled Aeronautical Engine, as Employed by This Inventor on His Aeroplane.

production of a five or seven-cylinder engine the cylinders of which were staggered round the upper half of a circular crankcase, and all connected up to a two-throw crankshaft. By means of this radical departure from standard lines of gasoline engine design, Esnault-Pelterie has been able to obtain an engine developing 35 horsepower on the brake at a speed of 1,500 revolutions per minute, for the extraordinarily low weight of 115 pounds. This weight includes carbureter and all ignition accessories, the motor in fact being in running order. That it is more than a piece of clockwork is proved by the fact that Esnault-Pelterie has used the engine continuously on his own aeroplane and executed several flights in his new machine by means of its aid.

Having an odd number of cylinders and a two-throw crankshaft, it was of course necessary to have more pistons connected up to one of the throws than to the other. On the seven-cylinder engine the two arms of the crankshaft, which by the way only weighs seven pounds, are laid at an angle of 180 degrees, three connecting rods being attached to one and four to the other. The shaft is balanced to counteract the uneven division. The cylinders are really staggered in two series on the crankcase, the four forward ones in a line with pistons connecting up to the forward throw of the shaft, and the three others slightly in the rear connecting up to the other arm.

The cylinders of the Esnault-Pelterie engine, cast separately with cooling flanges on the upper portion, have a bore of 3.3 inches and a stroke of 3.5 inches. They are attached to the one-piece aluminum crankcase with three bolts each having two different threads, so that the slackening of the nut would tend to the tightening of the lock nut. Instead of the wrist pins being attached to the interior walls of the piston, as is the usual practice, the bearing is here screwed into the head of the piston, the steel walls being far too thin to allow of any attachment.

Something New in the Matter of Valves.

Valve design is just as radical a departure from fixed standards as any other portion of the engine, each valve, placed in the head and operated by an overhead rocker arm, fulfilling the functions of both inlet and exhaust. Above the flat face of the valve—the valve is of course reversed, the head being downward—is a cylindrical cage provided with a series of holes and encircled by a steel collar. On the full opening of the valve aspiration takes place in the usual way, the exhaust openings from the cage to the outside being closed by the collar. On compression and firing strokes the valve operates also in the usual manner, but on the exhaust stroke the collar closes all connection with the intake pipes, the valves slightly leaves its seat and the spent gases are evacuated through the opening in the cage left free by the position of the collar, showing that the inventor has departed entirely from the usual method of valve operation. There are thus three positions for the

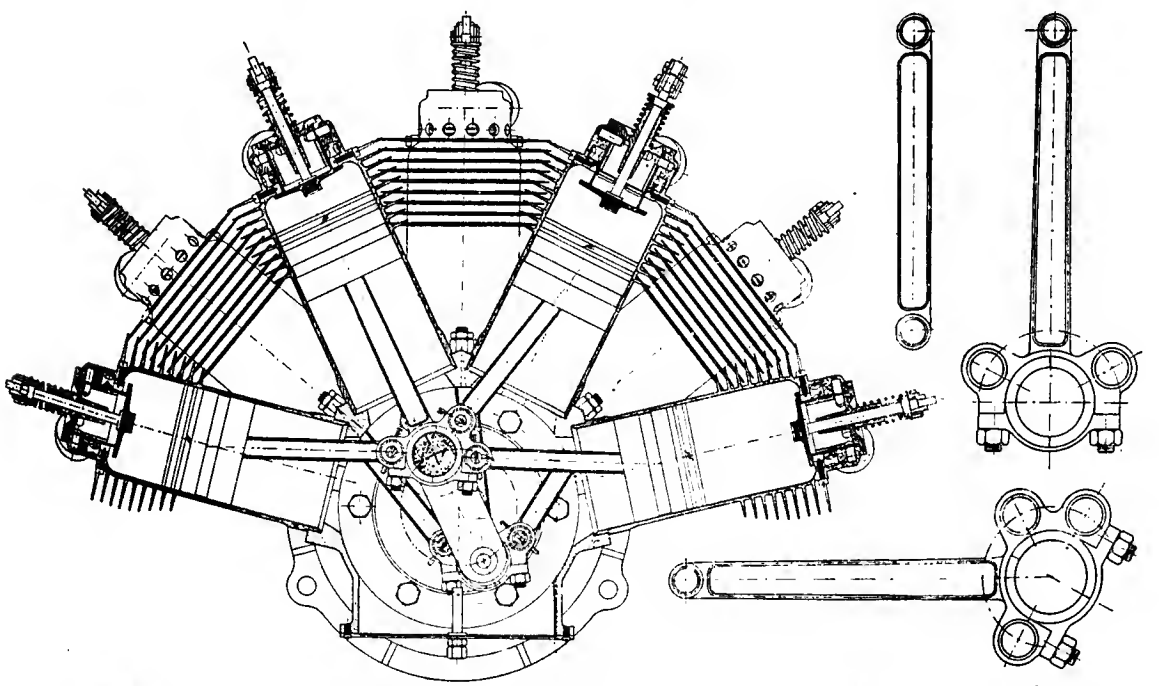


Fig. 6—Cross Section of Seven-Cylinder Esnault-Pelterie Aeronautical Engine, also Showing the Connecting Rods.

Fig. 7—Combined Inlet and Exhaust Valve as Used on Esnault-Pelterie Seven-Cylinder Aeronautical Engine.

valve; closed, fully open for the intake, and partially open for the exhaust. Though at first sight complicated, the valve mechanism is in reality exceedingly simple, for it practically abolishes one valve with all its attendant mechanism and solves the hitherto difficult problem of cooling the exhaust valve on an air-cooled engine by reason of the passage of the cold current of explosive mixture around the valve at a speed which, translated into miles, often exceeds 180 an hour.

In reality one double cam operates all seven valves. Had it been possible to place the cylinders in one line a single cam would have been sufficient; owing, however, to the second set of cylinders being slightly to the rear of the first group, the cam, driven off the crankshaft and turning in the contrary direction to the engine, has to be double faced, each face having three large bosses for the inlet and three smaller ones for the exhaust.

Two carbureters are provided for each engine, one feeding two front and two rear cylinders and the other supplying gas to the remaining three. There is little that is distinctive about the ignition, current being supplied by a storage battery and distribution taking place through a commutator placed outside and to the rear of the engine—the side opposite to the propeller—in order to keep it free from oil.

Lubrication is entirely by splash with the difference that in order to prevent an uneven suction of oil into the more oblique cylinders on the lower part of the circular crankcase, the base of each cylinder is covered with a mask provided with an opening for the passage of the connecting rod. This opening increases in size in proportion as the cylinders approach the vertical. Naturally the splash is greater on the inclined cylinders, but as the opening here is smaller the amount of oil allowed to enter is not any greater than that drawn into the central vertical cylinder.

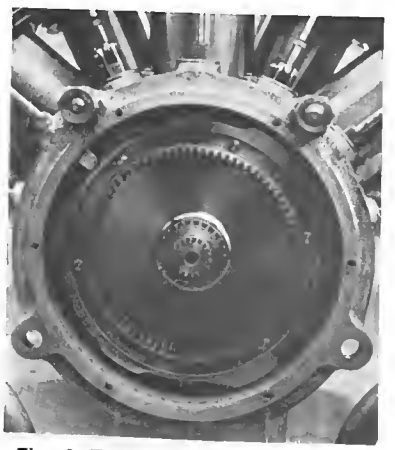


Fig. 8—Esnault-Pelterie Seven-Cylinder Aero Engine. Forward End of Crankcase Is Removed, Showing the Single, Double-Faced Cam Operating all Valves.

Several attempts have been made to produce an engine with an even number of cylinders placed at equal distances around a circular crankcase, but none appear to have progressed beyond the testing room. Burlat, following up the four-cylinder revolving motor exhibited a year ago at the shows, has produced an eight-cylinder engine of a similar type, and Farcot has among his many inventions an engine with eight air-cooled cylinders fixed at equal distances around a circular crankcase. Doubtless it would be possible to unearth scores of other attempts to solve the problem of high power with light weight. For the present, however, it is sufficient to leave the inventors to their task; when they have succeeded in producing an engine that will meet the exacting requirements of the knights of the air, who, it is hardly necessary to mention, are much more exacting than the most critical automobilists, it will be time enough to call attention to their products.

"RÉPUBLIQUE" ACCEPTED BY FRANCE.

Paris, Aug. 8.—After being tested in every possible manner, *République*, the dirigible airship built by the Lebaudy brothers, has been handed over to the military authorities of France and is henceforth the chief aerial fighting force of the nation. The official flight took place at Moisson, 30 miles from Paris, under the control of Engineer Julliot, designer of the *République*. The slight defects that had been revealed in the preliminary trials had all been remedied, with the result that ballast was perfect and the slight roll of a fortnight ago had disappeared. When the military crew has been sufficiently trained by short journeys around Moisson the airship will be brought to the Chalais-Meudon station in the suburbs of Paris, to leave later for its permanent station on the Eastern frontier.

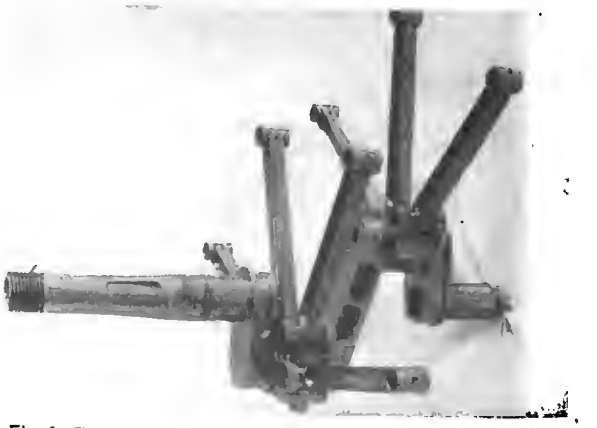


Fig. 9—Two-throw Crankshaft of Esnault-Pelterie Seven-Cylinder Aeronautical Engine.

Louis Bleriot's success with the monoplane type of flying machine has not been of long duration. After proving conclusively that the single plane type was superior to the biplane, as used by Farman, the champion of the former system recently made a number of successful flights of moderate length on the Issy-les-Moulineaux ground, only to fall a victim to contrary currents. While attempting to make a turn the machine was caught in one of the swirls which are so much feared by Farman, suddenly dived down from a height of 100 feet, swung over to the left until the tip of the wing touched the ground, pivoted and flopped to the ground. Though all the forward end of the apparatus was broken and the left wing suffered seriously, Bleriot escaped without a scratch and was sitting upright in his seat when the assistants rushed to his rescue.

Leon Delagrange, who returned from his Italian tour the day Farman sailed for New York, declares that he will now commence experiments with the monoplane type of flying machine, the biplane having proved itself excellent in calm weather, but very unreliable in a wind and dangerous in whirling currents.

At a dinner given to M. Farman, before his departure for America, to celebrate his winning the Armengaud prize for a quarter of an hour flight, a new prize was offered by M. Deutsch. The sum is 25,000 francs, and the conditions are that the successful competitor must carry Commandant Renard, of road-train fame, across the English Channel.

LETTERS INTERESTING AND INSTRUCTIVE

WHY MORE SPEED WITH LESS ENGINE?

Editor THE AUTOMOBILE:

[1,499.]—I have been greatly interested in following the various transitions through which French racing rules have gone in the past few years, and would like to have a query concerning them answered through the column of "Letters Interesting and Instructive." I understand that the unlimited bore plan of last year—in other words, the fuel consumption restriction, was done away with, principally because it placed no restriction whatever upon the speed of the car. But from the accounts of this year's Grand Prix race which appeared in "The Automobile" at the time, I learn that the speeds averaged by the different competitors, under this year's limited bore rule, were greatly in excess of those attained last year, while some of the single lap records were so very much faster as to make it apparent that some new restriction must be adopted next year—if there is to be a next where the Grand Prix is concerned—in order to keep speeds within a limit that tires may reasonably be expected to endure on such road courses as are now employed for the big international events. What I would like to learn is, How did the designers succeed in getting so much more speed out of their cars where they had to conform to a limited bore restriction, as compared with the cars of the year previous in which there was no limit to the size of the motor. I know that a great many things are possible with the automobile motor, but have not been able to explain this satisfactorily.

Allentown, Pa. EFFICIENCY.

It is a matter of common knowledge that a horsepower may be produced by the use of less than 10 pounds of metal in a motor, and, on the other hand, that it is quite possible to use 200 pounds, 300 pounds, or any quantity of iron, to achieve the same result. For instance, the average stationary motor of small size weighs anywhere from 100 to 250 pounds per horsepower, a 5 or 6-horsepower engine weighing more than half as much as a complete 30-horsepower automobile in running order. It is principally a matter of piston speeds and compression, and this accounts in large measure for the difference in the speed of the racing cars of the two years. Again, it is one thing to design a motor that will show the maximum economy, and quite another to produce one that will show the greatest output for its dimensions and weight, regardless of any consideration of fuel consumption for the power delivered. Every motor has what may most aptly be termed its "critical speed." In other words, its rate of delivering work at which it is most economical in fuel per horsepower, and in order to achieve the latter end, it must be run at that speed. Hence, it cannot be said that this year's cars were faster than those of the year previous, because the latter were not run so much for speed as they were for economy. It would not have availed one of the competing drivers much to have beaten all his competitors by even half an hour's time, if he were stranded so much as a hundred yards away from the finish on the final round through lack of fuel, as his victory would have counted for nothing. The rules made the winner the first car to finish the distance on its fuel allowance, and the fact that many of them were unable to do so was probably due to their reckless use of fuel, as it is well known that a motor is very extravagant at extremely high speeds, owing to the amount that is wasted. Practice runs before the 1907 Grand Prix were mainly to find out just how far a car could run on the allowance granted by the committee, and just what speed it had to be run at in order to cover the distance. Many of the drivers learned both well in advance, so it is quite reasonable to suppose that in few cases were the cars let out to their possible speed at any time in the race, as that would have meant defeat in the last lap through lack of gasoline. Some combination of restrictions, such as the size of the motor and the amount of fuel, would appear to be the only logical method of bringing the possible speed down, and it is quite probable that future racing regulations abroad may take some such form as this within the next year or two, if not for next year's Grand Prix, should it be held in 1909.

BUY ONLY FROM A RESPONSIBLE MAKER.

Editor THE AUTOMOBILE:

[1,500.]—I do not recall having seen in your paper any warning to would-be purchasers of machines relative to their selecting a machine the manufacturer of which not only furnishes duplicate parts at reasonable prices, but who exercises the same care in filling orders promptly and well as they do in soliciting purchasers of the machine. About three weeks ago I sent to one of the best known manufacturers in this country the price of a float valve and stem for a carbureter. A week later I received the valve. I addressed another letter to them and at the end of another week received the float. I am writing them to-day in regard to the stem.

Further, I have observed that many young men, especially in small towns, are enticed into buying a machine by the big discount offered to agents. Aside from the fact that some of the concerns offering these large discounts frequently go out of business, any purchaser of a type of machine, the construction of which is new to his community, is more or less handicapped, and should the manufacturer go out of business, he is up against it for duplicate parts. It is well known that automobile repair establishments in small towns usually represent certain machines, and in many instances they do not take the interest in repairing other makes that they should. Would it not be well then that every one desiring to buy a machine should inquire of his friends their experience in getting supplies from the manufacturer of the machine which he has in view? R. F. HARGRAVES.

Port Norfolk, Va.

The point that you call attention to in your letter has been constantly harped upon for the past two or three years in these columns whenever the question of buying a car has been at issue, and the experience of those who have invested in any of the numerous makes that have sprung up and disappeared within the last three or four years have had this brought home to them very forcibly. This, however, has no direct bearing on the unfortunate experience that you detail in your letter with regard to obtaining a small replacement part, in view of what you say in regard to the standing of the firm in question, and it is to be hoped that such experiences are not common. There has been a great deal of progress made in the past two years in the matter, not only of supplying replacement parts, but of doing so at reasonable prices, and there seems to be no doubt that as time goes on this will finally be brought down to a basis where it is on the same plane with that of any other business.

SOME QUERIES ON A NUMBER OF SUBJECTS.

Editor THE AUTOMOBILE:

[1,501.]—I would like to ask a few questions:

1. The advantages and disadvantages of a three-cylinder, four-cycle gas engine.

2. If in a two-cycle engine there is just as much compression in pounds in the crankcase as in the cylinder at the joint time of compression.

3. Take a racing machine, about how many r.p.m. does the engine go when the car is traveling at 60 miles per hour?

4. The duties of a mechanician on a racing machine.

Warren, Mass. LOWELL S. ELLIS.

1. The three-cylinder motor of the four-cycle type is much more difficult to balance so far as its power impulses are concerned, than the four-cylinder motor of the same type, which accounts for its rare use on the automobile. That is, whether the crankpins are placed 120 degrees apart round the circle, or two of them are in the same plane with the third at 180 degrees, the order of firing is irregular, and though well-balanced mechanically, in the case of the 120-degree arrangement, its impulse balance is poor in either case. Although largely employed for stationary work, as well as to some extent in marine practice, we could never see that the three-cylinder motor had any particular advantages on the automobile. However, there are authorities who are of the contrary opinion, and if they wish to do so, they may come

forward in these columns in support of their side of the question, as it may be of interest to readers generally.

2. This question is rather ambiguous, but we presume you mean by "at the joint time of compression," the moment that the charge is transferred from the crankcase to the combustion chamber, because when the piston is compressing, a fresh charge is being drawn into the crankcase. If this be correct, it is evident that the answer to your question must be "No." With the same degree of compression on either side of the transfer port, i. e., in the combustion chamber and in the crankcase, there could be no movement of the charge. As it is, the fresh charge is under a compression of anywhere from 3 to 8 pounds, according to the design of the motor, while in the combustion chamber it is very slightly above atmospheric, thus permitting the inflow of the supply of fuel from the crankcase. The amount of pressure in the latter, the size of the ports and the like, are all calculated to permit of as quick a transfer as possible, as the port is only open for a very small fraction of a second.

3. This naturally depends upon whether it is equipped with a high or a low-speed motor and what its gear ratio happens to be, so that it would be impossible to even approximately answer the question for this particular speed without knowing something more about the car. In general, however, it might be placed at anywhere from 1,200 to 1,500 r.p.m., but as many of the cars in important road races average speeds as high or better than this for the whole distance, and go as fas as 90 to 95 miles on straight stretches, it is evident that their motors are capable of running much faster.

4. While running, the chief duties of the mechanic are to watch the oil, and a special hand pump by means of which extra oil can be injected directly into the crankcase is usually provided. He also watches any other adjustments that can be made while under way, and when stopped for repairs or tires, assists the driver in making these, the rules under which most recent contests have been run providing that only the driver and his mechanic can attend to such things and that outside assistance will be sufficient to disqualify the car.

MORE ABOUT THE COAL-BURNING STEAMER.

Editor THE AUTOMOBILE:

[1,502.]—A good many people interested in automobiles know of my efforts to bring out a steel-tired steam auto with no differential and burning coal. I took the auto out lsst wsek and ran it about town. All went fine sxcept the fire. I had 90 pounds of nut coal in ths fire-box and it was impossibls to consume all the steam. Our villags is vsry hilly, and going down hill with steam shut off ths gauge would gain 110 pounds in one minute. I went up a 15 per cent. grade with nine men in the car and the brakes on slightly. It turned corners perfectly, proving that a differential is not necessary with steel tires. I am now putting in a kerosens burner and a steam pump, so I can get water in the boiler with the auto standing still. I would like to know whether a mixture of gasoline and kerosene would be better than pure kerosene, and, if so, in what proportions. By the way, I got up 15 pounds pressure in 9 1-2 minutes with kindling wood, befors I put on coal.

Oneonta, N. Y. M. W. HAZELTON.

We cannot advise you about the gasoline-kerosene mixture from personal experience, but if you get a burner specially made for kerosene it would probably be best to stick to that fuel. In any case, the proper proportions of a mixture could only be determined by experiment in each individual car. But what is the matter with coal? As you have succeeded with it so far, it would seem that a little ingenuity would enable you to fix up some sort of a fire-controller to prevent such wasteful generation of steam.

BOOKS ON MOTOR CONSTRUCTION AND DESIGN.

Editor THE AUTOMOBILE:

[1,503.]—Will you pleass let me know if there is anything published that covers the subject of ths construction of gasolins motors, mors particularly ths setting or adjusting of the valves.

Somerville, Mass. G. P. BIAGIOTTI.

There seems to be a lack of works of a technical nature on the subject of the design and construction of the automobile motor so that it is impossible to refer you to any single work from which you can obtain the information you are in search of. "Elements of Gas Engine Design," by Sanford A. Moss, M.S. Ph.D., and Roberts "Gas Engine Handbook," may give you what you want, although the latter is not only old, but is devoted to stationary practice. "The Automobile Pocketbook," by E. W. Roberts, M.E., may come closer to the requirements, though but a small part of it is devoted to the motor. Other works are "The Gas Engine," by F. R. Hutton, M.E. Ph.D., and "Gas, Gasoline and Oil Engines," Gardner D. Hiscox, M.E., but neither of these falls within the requirements as set forth by your inquiry.

WANTED: A DEFINITION OF "INERTIA."

Editor THE AUTOMOBILE:

[1,504.]—Please give me in your "Letters Interesting and Instructive" a good dsfinition of the word inertia. A number of auto cranks, myself included, lately got into an argument relative to the proper meaning of this word. I gavs a definition as follows: Inertia is ths resistance that a body offers against s change in its position. Anything from your columns will be greatly appreciated. R. G. McCREIGHT.

Camden, S. C.

Inertia is that property of a body by which it tends to continue in the state of rest or motion in which it may be placed, until acted upon by some force. As used by the non-technical, it is almost universally employed in the former sense, i. e., that of the resistance which a body offers against a change in its position, an inert body usually being intended, so that your definition is perfectly correct so far as it goes. The popular impression is that only inert bodies have inertia, it being likewise generally thought that a moving body is possessed of momentum alone, whereas an object at rest is possessed of inertia, and the same object in movement has both momentum and inertia.

INFORMATION WANTED ON COMPLETE GEARS.

Editor THE AUTOMOBILE:

[1,505.]—Could you direct ms to any one company that furnishes running gears, complets, minus tires? That is, everything necessary for the chassis of an automobile, but not in their sssembled state, ths parts to bs put together by the buyer.

Louisville, Ky. H. E. HARRYMAN.

You will find several advertisers of such materials in our columns, to whom we can recommend you. Vast quantities of motors and parts are now being turned out by independent manufacturers, and the components of a complete car may now be purchased from a jobbing house or from a number of different makers, each one supplying his own specialty.

A RECOMMENDATION FOR DECARBONIZER

Editor THE AUTOMOBILE:

[1,506.]—With pleasure I write that I have been using the Radium Decarbonizer on a Frayer-Miller 24-horsepower car (air-cooled) for the last ten months as per direction, which is very simple, with perfect satisfaction. It has been now fifteen months since I had the cylinders scraped of carbon and I used the car for thirteen months before I had tbe valves ground. I have been running this car now for four years, winter and summer, in my professional work, besides taking extended tours with my family during my yearly vacations, and I must say that ths car is running perfectly fine with the above treatment. I have no trouble of overheating or pre-ignition.

Erie, Pa. P. T. JOHNSON, M.D.

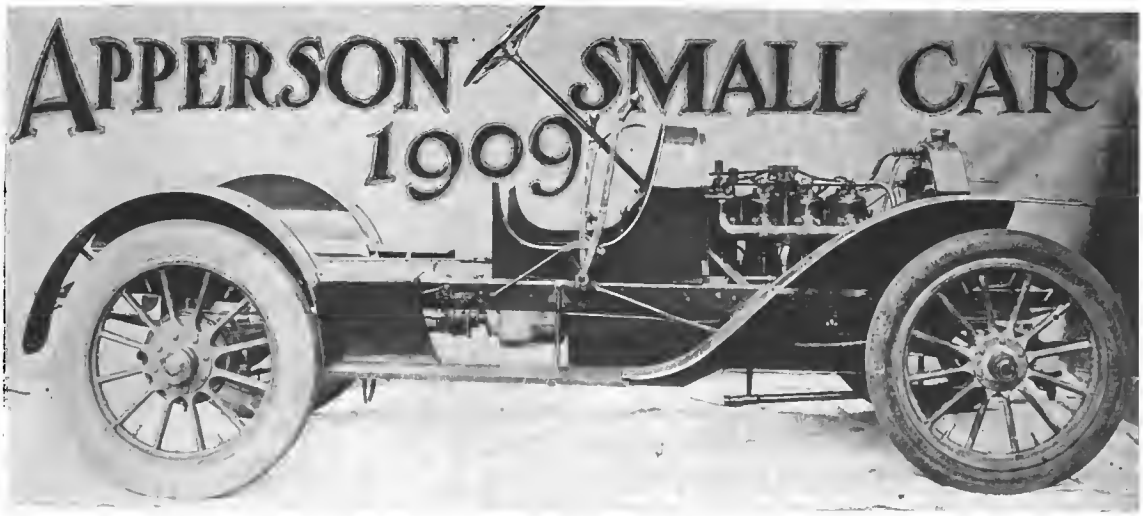
AN EXPERIENCE WITH DECARBONIZER.

Editor THE AUTOMOBILE:

[1,507.]—In answer to Mr. Stark's question (1,497) regarding Decarbonizer. I have used it and several of my friends havs used it this year and so far results have bsen all claimed for it by the manufacturers. Several of my friends and myself used a certain brand of oil and in a few weeks all had carbon galore. Whether it was the fault of the oil, or ourselves, I do not know, but I do know I nevcr had troubls with any other oil carbonizing. The Decarbonizer worked fine and so far there is no indication of injury to the cylinders or pistons.

Duluth, Minn. F. C. LEE, D.D.

APPERSON SMALL CAR 1909

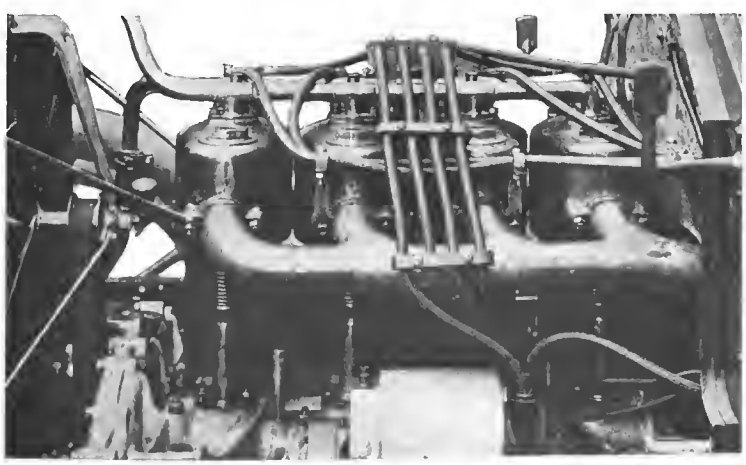


THERE are not many firms in this country, nor for that matter abroad, who can look back upon 16 consecutive years of automobile manufacturing, and for that reason the sixteenth annual announcement of the Apperson Brothers Automobile Company is of more than the usual interest. Its purpose is to present an entirely new car of the medium-powered type to sell at a low price, and is coupled with the statement that the company has largely increased its manufacturing facilities and is planning to turn out 2,000 cars during the coming year. While "Model O," which is the official designation of the newcomer, is a new production and in a field that the Apperson Brothers Company has not entered hitherto, it takes but a glance at the specifications and the photographs of the car to reveal the fact that it is almost an absolute replica of the standard Apperson cars of higher power, on a slightly smaller scale.

Characterized Throughout by Apperson Features.

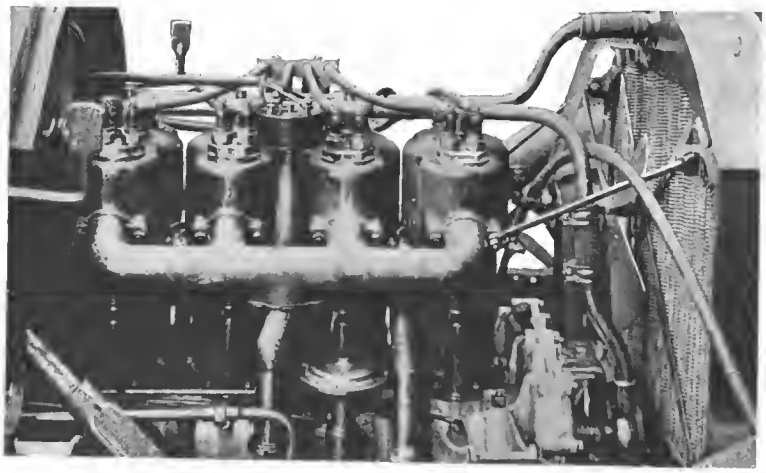
This is at once evident upon making an inspection of the motor, which is constructed with the independent cylinder castings and oppositely disposed valves in outboard ports that have always distinguished the Apperson motor. The valve lifters and cages are of a specially designed type made with a view to reducing the noise, and for their enduring qualities. The half-time shafts operating the valves are enclosed in the crankcase, and either can be withdrawn at the end of the motor without interfering with the adjustment of any of the other working parts. In order to be able to compensate for wear, the valve lifters are provided with a device which permits of adjusting their length to suit that of the valve stem.

While the motor appears to be an absolute copy of the larger Apperson engines, it is not merely a reproduction of the latter, but has been specially designed for the purpose, the valve ports, compression, exhaust clearance, timing and other matters pertaining to the production of an efficient high-speed motor having been carefully worked out in the design. The motor normally develops 28 to 32 horsepower, but has shown as high as 38 horsepower on the brake. Its rating under the A.L.A.M. formula is 30.4 horsepower. Every part has been carefully jigged in the factory, making them all interchangeable for replacements or repairs. The carbureter is of the type made in the home factory and employed on the Apperson product, while a mechanically operated, force-feed type of lubricator is fitted to take care of this essential, oil being delivered directly to the bearings. For ignition, the standard equipment will consist of a set of accumulators and a four-unit coil, a dual ignition system with independent plugs served by a high-tension magneto being catalogued as an extra. A fin tubular radiator of the vertical pattern, such as has characterized Apperson cars for some time past, is employed, its head-on outline having been altered somewhat by the adoption of an extension to meet the forward end of the dust pan extending under the engine and which serves to keep the working parts of the motor and transmission free from road dirt and grit. A fan flywheel of the latest type has been adopted on the motor and tests, as well as service try-outs, have shown that this aids materially in the cooling of the motor. In this and many ways, the painstaking attention that has been paid to every detail of the design of the new Apperson small car are apparent.



Showing the Situation of the Magneto and Wiring on the Apperson 1909 Small Car.

The contracting band type of clutch which has always been an Apperson feature, has been perpetuated in this new small car of the same make, consisting of a cast steel brake band contracting on a circular bronze drum. In fact, this Apperson clutch has been in use ever since 1895 without any change whatever, and certainly this length of time in service is sufficient to substantiate the makers' claim



Two Spark Plugs Are Carried Over Each Intake Valve.

that it is one of the most reliable types of clutch ever put on an automobile. The gear-set is what is familiarly known as the selective type, giving three forward speeds and reverse and controlled by the usual single side lever. Particular attention is called to the fact that the gear-set housing is all one piece, consisting of a single aluminum casting, and what is far more important, that the change speed gears and shafting can be lifted out intact without any further preliminaries than the removal of the cover of the case, it not being necessary to touch a bolt or nut aside from this. In fact, there is not a nut or bolt in the interior of the housing, so there is nothing whatever to work loose and cause trouble.

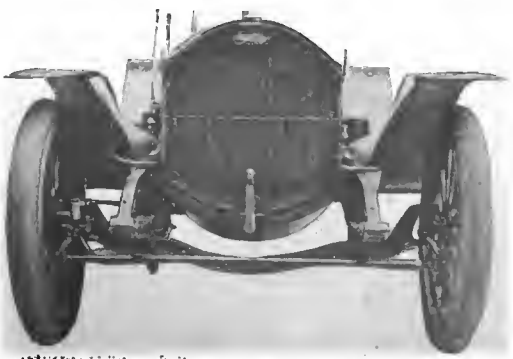
The design of this gear-set has been thoroughly worked out from years of actual experience, and the makers are of the opinion that it more closely approaches the distinction of being "fool-proof" than any other on the market. The gears are made from the best grade of Krupp chrome-nickel steel, which is generally conceded to be the best possible for the purpose, while the shafts are supported on the latest pattern of New Departure ball-bearings. The latter are specially designed to take both thrust and radial loads and are fitted with two rows of balls, instead of one, as is usual.

So far as the description goes, it will be noted that the car has the hall-mark of the Apperson factory stamped all over it, in that, with few exceptions in the shape of detailed refinements here and there, which are to be looked for in every new production, it exactly follows those lines that have always distinguished Apperson motor design and construction. It is in the final drive by propeller shaft that the most radical and probably the only divergence of importance from what have come to be Apperson standards has been made, this firm having always been strong and persistent advocates of the double chain drive. So far as their regular models of higher power are concerned, this is still adhered to, the adoption of the shaft drive on the smaller merely being a recognition of the fact that it is better adapted to the car of medium power and speed. The universal joints employed on this shaft drive are of the very latest type and are protected by oil and dust-proof housings. When carrying its normal load, the motor, gear-set and rear axle are practically in the same horizontal plane. The standard gear ratio employed is 3 to 1.

Some of the Chassis Specifications.

Following standard practice, the frame is of the usual pressed steel, channel section construction amply reinforced, and is carried on semi-elliptic springs front and rear, the former measuring 40 inches in length and the latter 50 inches. The springs are attached with a view to preventing breakage under the most strenuous conditions of service. The steering gear is of the usual worm and segment type that is entirely proof against movement from road shocks, while the brakes are of the internal expanding and external contracting types placed in hubs on the rear wheels. The former constitute the emergency brake, operated by hand lever, while the latter are employed as the service brakes. The forward axle is a one-piece drop-forging of Vanadium steel and of I-beam section. The spring saddles are forged integral with it, while the steering heads are carried on ball-bearings. For the rear axle equipment, what is commonly known as a floating type has been adopted, but it has been specially designed so that the driving wheels stand on "plumb spokes," a feature to be found in but very few cars. This prevents spreading of the wheels and makes a much easier running and faster car. Thirty-four by 4-inch wheels are used, the wheelbase being 110 inches. With a three or four-passenger body, the new Apperson Model O, lists at $2,250, and $2,400 with a five-passenger touring body. Deliveries are already being made of this newcomer to the Apperson fold.

The "Jack-Rabbit," Model K, 50-55 horsepower, seven-passenger touring car and three-passenger runabout; the Model I, 40-45-horsepower, seven-passenger touring car; the Model M, 35-40-horsepower car, with three, four or five-passenger bodies, and the Apperson 50-55-horsepower, six-cylinder, seven-passenger touring car, will all be continued, so that in designing this latest addition to the Apperson line, it has been the chief object of the manufacturers to extend their price range in order to be able to participate in the large and increasing demand that is daily making itself felt for the well-built car of medium price and power.



Front View, Showing Ball Bearing Vanadium Steel Axle.

Rear View, Showing Ball Bearing Floating Axle.

MAKING A 4,000 FOOT CLIMB.

What appears to be a record demonstration run was made June 27 by Edwin G. Woolley, Jr., in a 1908 Rambler roadster, who covered 36 miles from Salt Lake City to the top of Parley's Canyon Divide, over a 4,000-foot grade. Three passengers were carried and the route was through occasional stretches of sand and three miles of rutty clay road. For the first twelve miles the car ran on high gear, and the remaining distance was covered on the intermediate, the low gear not being used at all. Gasoline consumption for the entire trip was reported not to exceed three gallons. The roadster which made this climb has now covered 1,054 miles without having made a miss.

Edwin G. Woolley, Jr., Making Record 4,000 Climb in Rambler Roadster.

The mountain ranges to the east of Salt Lake City present grades that are extremely difficult to surmount. The altitude of Salt Lake City itself is over 5,000 feet above the level of the sea and the mountains of Utah tower above the city from 4,000 to 6,000 feet more. The divide mentioned above is one of the altitudes that separates the waterflow, the streams on the west side flowing into the Great Salt Lake and those on the east finding their outlet in the Colorado river. The Wasatch range which constitutes the divide, runs north and south through central Utah. The Uintah range from east to west connects at Strawberry valley.

Arthur C. Hull in Cadillac Runabout on Twin Peaks.

UP SAN FRANCISCO'S HILLS.

Twin Peaks, the highest altitude on the peninsula on which San Francisco is built, form a background to one of the leading thoroughfares of the City of the Golden Gate, and are 900 feet high. Some idea of the grade percentage may be obtained from the photograph in which Arthur C. Hull, of that city, is depicted climbing one of the peaks in a Cadillac runabout. Pacific Heights next approach in altitude the Twin Peaks, but are somewhat lower, while Nob Hill, which contains the palatial residences of the California money kings, is about 300 feet high and well adapted for habitation.

The streets north and west of Market street strike boldly at the hills and have gradients of 50 per cent., and this feature is what gives San Francisco its imposing sky line when viewed from the bay, as the houses have the appearance of being piled on top of one another. The points of vantage on the hills present scenes of great beauty, embracing the broad Pacific on the west, San Francisco bay and its islands on the east, and the active commerce and densely populated districts of the city with distant mountains as a background.

IN THE WONDERFUL PARKS OF LOS ANGELES.

In no spot in the world is the benefit of irrigation more apparent than at Los Angeles, Cal. The city, its surrounding parks and contiguous territory, is a veritable paradise of vegetation, semi-tropical in its nature, while vast stretches of country immediately encompassing, that are as yet un irrigated, have the appearance of a desert.

Los Angeles was settled by the Spaniards as Pueblo de Nuestra Señora La Reina de los Angeles (City of Our Lady the Queen of the Angels) in 1781, and until 1847 alternated with Monterey as the seat of the Mexican Government in California. It was captured from the Mexicans after some resistance in 1846 by General Stockton. The city is the possessor of 3,700 acres of magnificent parks and botanical gardens known as Elysian, Westlake, Eastlake, Hollenbeck, Griffiths, Central and Plaza parks.

W. M. Hill's Winton (Which Has Traveled 38,000 Miles) in Elysian Park, Los Angeles.

ILLUSTRATING THE AUTOMOBILE'S GROWTH.

Indianapolis, Ind.—The last of the picturesque stages that have traveled over Indiana roads since pioneer days are disappearing, and within a few months it is likely not one will be left. The automobile has supplanted them gradually during the last two years. Although Indiana prides itself on its rapid development, there are two counties untouched by railroads, while a third county has only one railroad touching one corner.

Within the last two months a number of new companies have been organized for the purpose of operating automobile lines, and all are meeting with success. Last week the Greensburg, Napoleon, and Osgood Rapid Transit Company was organized, with $5,000 capital, and will operate an automobile line between those points, with headquarters at Napoleon. A twelve-passenger Rapid 'bus has been purchased.

George Straub, of Corydon, who has owned the horse-drawn stage between Corydon and New Albany for years, has decided that an automobile would be more profitable. He is organizing a company, and an automobile 'bus will be purchased soon.

The Connersville Motor Transit Company has made a success of an effort to use automobiles in place of street cars in that city. Two twelve-passenger cars make regular trips to different parts of the city and to the suburbs, with a five-cent fare.

Recently the Richmond Transportation Company was organized at Richmond, and has been operating a twelve-passenger car between that city and Reid Memorial Hospital, touching a large residence section not reached by city street cars. So far as known, this experiment has been the only unsuccessful one in Indiana, and the company is not ready to quit, believing the plan is practicable. It was found that the car in service did not have sufficient power to climb the hills, and a new one is to be purchased.

Temple, Tex.—Another addition to the rapidly increasing list of automobile stage lines was made last week when two 22-horsepower cars were put in operation between this city and Marlin. Although the two places are but 35 miles apart, the round trip by railroad requires a day and a half. Some agitation for an interurban electric line which had been made attracted the attention of J. F. Robinson, of San Antonio, and as the result of his investigations he decided to establish the stage. The route will include the villages of Oenaville, Blevins, Belfalls, Chilton and Mooreville.

Dallas, Tex.—A regular automobile stage service was instituted July 22 by the Dallas Motor Car and Transit Company between Sanger's Corner and East Dallas. Two large cars of the sight-seeing type are in use, and it is expected to make the trip in 20 minutes when Ross avenue is finished. At present the cars have to take to the side streets in places, and the schedule cannot be maintained. Cars leave at each end every twenty minutes from 6 A.M till 12 midnight. J. A. Bergfeld is president of the company, which has its shops at Monarch and Garrett avenues.

Washington, D. C.—The Post Office Department has received the five electric mail wagons for which it contracted recently and will put them into commission immediately, supplanting the present horse and wagon collection system. They will be supplemented August 15 by two more cars provided and run by letter carriers, an allowance for this purpose having been made. When all are in operation eight men and twelve horses will be saved in the city mail collection service.

New York Times:—In this "horseless age" the sprinkling of streets with water is going out of fashion. Thirty-three miles of Boston's thoroughfares are now either under oil, calcium chloride, or "tarve," a mixture much used on suburban highways. In New York top dressings of oil have been tried successfully in the parks. To the automobile's propensity of stripping the highway of its surface covering we shall owe the abolition of street dust altogether, and this will certainly be one of the greatest boons it can confer.

Salvationists Adopt Auto.—The founder and leader of the Salvation Army, General Booth, began his summer campaign in Dundee, Scotland. From that city he journeyed southward, preaching in Perth, Newburgh and Tayport. This year he is making use of an automobile, painted white, with "Salvation Army" on each side in gilt letters. Whenever the General desires to preach—whether it be on the country highway, or on the common of a town—the car stops and an adjutant unfurls a huge green umbrella. Drums and fifes then proclaim that the Army will hold a meeting.

Minneapolis, Minn.—The latest addition to the equipment of the Minneapolis Fire Department is a Wolfe touring car, which has been purchased for the use of Chief J. R. Canterbury. The car is made in Minneapolis, and is now in daily service as the chief's wagon. It is stationed at the city hall, and has been first on the ground at so many fires recently that the members of downtown companies are asking for motor engines and carts.

Baltimore, Md.—The Baltimore Taxicab Company was recently incorporated under the laws of Delaware with a capital stock of $150,000. The incorporators are George W. Knapp, Charles E. Ford, W. S. Belding, N. B. Loeb, Wilson J. Carroll, all of this city, and Charles Berg, of Philadelphia. The company will operate ten cars of 20 horsepower beginning next month. E. H. Clarke will manage the business.

Ogden, Utah.—In a few days several large sightseeing automobiles will be put in service from the mouth of the Ogden canyon up as far as the Oaks for the benefit of canyon visitors. The company which will operate the line has been incorporated as the Ogden Canyon Automobile Company; J. S. Corlow is president; Albert Scowcroft, vice-president, and Joe Decker, secretary and treasurer.

Bunceton, Mo.—An automobile stage service may soon be established between this town and Boonville and Tipton. Mayor O. H. Cramer and one or two others have been working quietly to this end, and have received much encouragement. A single 16-passenger car will be purchased to start with, and if the demand is sufficient another may be added.

Council Bluffs, Ia.—Plans are under consideration for the establishment of an auto bus line between this city and the Iowa School for the Deaf. A car will be run from the corner of Pearl street and Broadway every hour. Other lines may be started later. Among those interested in the project are H. F. Knudson, J. R. McPherson and Henry Sperling.

Louisville, Ky.—The police department of this city has just acquired two automobile wagons, and a 45-horsepower car has been purchased for Millmore Tyson, chief of the fire department. The chief's auto has a large box on behind to carry his fire togs and is equipped with a powerful searchlight.

Clarkston, Wash.—Clarkston now boasts a passenger automobile which runs between here and Lewiston. J. W. Horton and Scott Cowan are the owners and expect to have the machine make regular trips every half hour. If well patronized they will add another in the fall.

Kansas City, Mo.—This city may see its first taxicabs in service before the first of next year. Several local men of prominence are said to have organized a company to introduce them here; twenty-five will probably be ordered to start with, similar to those now in use in New York and other Eastern cities.

Washington, D. C.—The District of Columbia Water Department has added to its already very complete equipment a 3,000-pound Franklin truck, to be used as an emergency car. This latest acquisition has a speed of approximately 20 miles an hour and was constructed especially to meet the requirements of the work.

Jacksonville, Fla.—An automobile line has been established between Bartow and Mulberry and is a money-making proposition, as it is hauling a great many passengers.

Evansville, Ind.—Charles Sibley, of New Harmony, has plans under way for the establishment of an automobile line from that town to Mount Vernon.

DETROIT TO NEW YORK IN AN ELECTRIC

AFTER being eleven days on the road, during which they covered 916 miles, G. M. Bacon, chief engineer of the Anderson Carriage Company, Detroit, Mich., and G. D. Fairgrieve, one of the company's sales representatives, rolled into New York City in a Detroit electric, conclusively demonstrating that the electric vehicle has other fields than that of city work alone. In other words, there is no reason why it cannot be considered as an ideal car for a leisurely tour anywhere in the Eastern States where charging stations are numerous and never very far apart. The entire trip was made at an average speed of 11 1-2 miles an hour, and 63 miles was the average distance covered on each charge of the battery, despite the great amount of mud and road under construc-

Starting from the Pontchartrain at Detroit.

tion that the electric tourists were compeled to plough through *en route*. With the exception of a single puncture, received just this side of Buffalo, and the necessity for tightening the chains at Geneva, not an adjustment was made on the car in the entire trip, the other three tires not even being pumped, although the car weighs 2,000 pounds and carried 150 pounds of supplies, equivalent to a third passenger.

During the course of their leisurely trip, which was not undertaken with a view to making a record of any kind, but merely to show what the Detroit electric was capable of, the tourists had many amusing experiences. They were badly handicapped by not knowing the country through which they were passing, and, in consequence, could not outline any schedule that would insure their reaching a charging station at the end of each day's trip, but despite this they were not delayed on that account at any time. One of their most interesting experiences grew out of this lack of knowledge of the country and it shows that with a little resourcefulness an electric may be run anywhere through a populated country. According to one of their informants, current was obtainable at Ashtabula, O., but upon arrival there they found they had been misinformed. They were then 30 to 40 miles from Erie, Pa., the next large place on their route, and it was naturally out of the question to travel that distance. They pushed on, however, and a stop was made at Coneaut, O., where connection was made by throwing a wire over the trolley line, and a half barrel of water used as a horse trough was utilized as a resistance through which to cut down the 550-volt current to the required strength for charging the batteries. Upon arriving at Little Falls, N. Y., a place that had been counted on as a recharging station, it was found that the electric light and power plant had shut down for the night before they got there. The obliging attendant, however, ran one of the exciters to accommodate them and the batteries received their full charge before morning, no difficulty being experienced anywhere along the route to get a full charge over night. An experience practically identical with what they encountered at Little Falls awaited them at Hudson, N. Y., but the sight of an electric car on a long jaunt aroused so much interest that aid was always forthcoming and no charge was made for the accommodation in any instance, though if the current had been paid for at the usual prevailing rates the cost of the trip, so far as "juice" was concerned, would have been about $8 to $9, as the car was only on charge 84 hours during the trip.

The only time that the car was unable to run was between Pittsford and Menden, just this side of Rochester. There the electric tourists found themselves on a high-crowned, yellow clay road with the rain coming down hard and no chains on the driving wheels. To have gone any further would have meant the ditch, as it was impossible to run without having the car skid all over the road, which shows that it is a good thing to have chains along.

The average mileage of 64 miles on a charge does not represent anything near the maximum covered without a stop for "juice," despite the extremely adverse weather and road conditions, all of which tend to cause an electric to consume power at an excessive rate for the distance covered. From Buffalo to Rochester, a distance of 77.9 miles, the rain came down heavily for all except 14 miles of the way, making the roads very heavy, in spite of which the distance was covered on a single charge. From Albany to New York there was rain for practically the entire distance, as was the case in Ohio and further west in New York; many of the State roads were ploughed up in the course of rebuilding. The chains were kept on all the way from Albany in, but the distance

Ascending One of the Many Grades Near Erie, Pa.

from Poughkeepsie to New York City was easily made on a single charge in spite of the adverse road conditions.

Bad going did not prevent an excellent showing where distance was concerned, the car averaging about 84 miles a day, the high odometer reading being accounted for by the fact that in numerous cases it was necessary to make detours of several miles to avoid roads that were closed on account of construction, and owing to the numerous demonstrations of the little Detroit electric that were given in every town where the tourists made a stop. Messrs. Bacon and Fairgrieve were determined to go as far as they could without meeting any extreme conditions, or until the task of getting along began to exceed the pleasure and profit to be gotten out of the trip. On being compelled to push or tow, they were going to ship the car home, but they never even came within hailing distance of that misfortune. The Detroit electric in which they made the run from Detroit to the metropolis is equipped with a 48-volt Elwell-Parker motor, driving to the rear wheels by chain, and a 24-cell, 11 MV Exide battery.

THE AUTOMOBILE

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LIMIT BOTH BORE AND STROKE IN RACING.

The results of the recent Grand Prix race certainly seem not to warrant the continuation of the 155 mm. maximum bore rule for another year. The French designers who proposed and supported this rule have been the first to admit its defects; and, although they have been accused of self-interest and of wishing to establish such rules as will practically assure a French victory, their position is, nevertheless, quite justifiable. It is undeniable that tires under present high speed racing conditions introduce an extremely undesirable element of luck into the contest.

In the list of proposed amendments, one which has found considerable backing is to limit the stroke as well as the bore. S. F. Edge, the well-known English racing man, is quoted as saying that it is a mistake not to take the stroke into consideration, as it will result in engines of abnormal length of stroke, which are very severe on the mechanism and tires, and at the same time cause a considerable amount of vibration throughout the chassis. "I feel sure that the tremendous failure of tires throughout the Grand Prix race was due, to a large extent, to the length of stroke employed in many of the engines," Mr. Edge comments.

A glance at the specifications shows that the average stroke of the engines has increased from 6.08 inches in 1907 to 6.63 inches in 1908, in spite of the fact that the limited fuel consumption rules in 1907 seemed to favor long-stroke engines. It is hard to believe, however, that this increase alone was responsible for the terrible slaughter of tires. All designers have a pretty close realization of the maximum permissible piston speed, and when they increase the stroke they may be depended upon to decrease the maximum number of revolutions per minute in proportion. Besides, any increase in the stroke means an increase in the height of the engine, and consequent raising of the center of gravity—something never to be risked on a racing car. The true explanation of the unprecedented amount of tire troubles will very probably be found in the increased weight of the cars, which averaged 300 to 400 pounds heavier than those of last year. This extra weight was, in most cases, placed directly over the rear axle, with the idea of securing better adhesion. With the size and strength of the tires remaining the same, and speed increased, the result was to be expected.

Another proposition, which seems to strike much more closely at the root of the difficulty, is to still further decrease the maximum bore. Mr. Edge proposes 127 mm., which translates to a few thousandths over five inches. Such a rule would certainly eliminate tire troubles, both by lightening the cars and by reducing their speed. The question then arises as to whether the reduction of the speed would not take away so many of the spectacular features of the race as to preclude any possibility of its being a financial success. Many of the constructors assert, however, that they can build cars of this size with a speed of 90 miles an hour, which ought to furnish enough excitement, and, owing to the greater regularity to be expected when the disturbing element of tires is removed, the finishes should be closer and more exciting. The danger to drivers and to spectators would be decreased, and as the engines would be held at their maximum power for a larger part of the time, the test for them would be even more severe. The list of entries would be more representative, as most makers could enter cars that would be practically stock models, and would thus avoid an expense at present often prohibitive. On the whole, the 127 mm. bore amendment seems well worth trying, and it should go far toward solving the problem of how to make automobile racing a sane and profitable sport.

While this year's Vanderbilt participants are limited neither in bore nor stroke, but must have a minimum and must not exceed a maximum weight, it is generally believed that the fourth race for the famous cup will be the concluding one wherein speed alone is unconfined, except by what strains and stresses the tires will withstand, which factor, of necessity, must contain something in the way of luck. As soon as a limit is placed on speed, it may be that the spectacular features in automobile racing which attract the public will be extracted sufficiently to cause a diminution in interest. Furthermore, many makers, both here and abroad, are now convinced that racing has lost much of its value to the industry, though those who dissent are still industriously active, and will continue to support those big events which take place near large cities and attract thousands of spectators, among whom are many possible buyers in possible plenty. It is safe to predict that over a million people will see the Vanderbilt race and the Long Island Motor Parkway, October 24 next.

PLANS FOR THE NEXT GARDEN SHOW.

The show committee of the A. L. A. M. has awarded to S. R. Ball for the fifth year the contract for the decorative work of the Madison Square Garden show. The general architectural scheme, prepared by W. W. Knowles, will be something entirely different from any previous show, and it is predicted that it will he effectively pleasing.

TIRE MAKERS WILL STOP PRICE CUTTING.

CLEVELAND, O., Aug. 11.—In a continuation of the effort to put a stop to price cutting, another meeting of the tire manufacturers was held in this city to-day. Nothing very definite was decided upon, and it is thought that another meeting will be held some time before Septemher. At the meeting to-day, which was fairly well attended, the impression prevailed that the best methods of stopping the price cutting would be to cut the dealers' percentage of profit, thus giving him practically no opportunity to cut to the consumer. It is also possible that the list price will be shaded somewhat this year.

The "International Motor League" of Buffalo was also considered at the meeting this morning.

Any changes in the list prices of tires will go into effect September 1, and any changes in dealers' discounts will also be announced at that time.

A. C. A. PLANS A LIGHT CAR RACE.

The governors of the Automobile Club of America have approved of a scheme to run a 200-mile race for light cars in connection with the scheduled race at Savannah, Ga., on Thanksgiving Day under European rules, and have handed the project over to the club's contest committee.

Under the proposed limitations each car must have a minimum weight of 850 pounds and the equivalent of a maximum of 3 3-4 inches cylinder diameter for a four-cylinder motor, or an equivalent in effective surface for motors of a different number of cylinders. This would give a range of 7.50 inches to 2.65 inches for four-cycle motors from one to eight cylinders, and 6.35 to 2.24 inches for two-cycle motors from one to eight cylinders. The cluh announces that the course will be completed by October 1.

DISTANCE ENDURANCE TOURS ARE EDUCATION.

One big manufacturing concern unquestionably believes in long-distance endurance tours, and this is what Col. Charles Clifton, of the George N. Pierce Company, has to say:

"We mix in these national tours for a purpose. It is education and we have come firmly to the opinion that the proper thing to do is to send men from the factory working force to travel on the cars as observers. In making such a trip our men gain a knowledge which cannot be secured in the ordinary testing trip. They ride on cars driven as cars would not be driven in regular tests. In fact, were our men to go out to test cars and abuse them as they have to be abused on these great tours I can firmly say that we would drop them from our list, for the wear and tear placed on a car in one of these two-thousand mile trips is much more severe than any wear and tear which even the most foolish owner would put his car to in a trip. We want to make a car to stand up under anyone who may happen to become a purchaser. From the outset of the big tours we have competed for this reason and the experiences of each year have been carefully noted and incorporated in the cars of the next year. Our experiences have enabled us to produce a car which would do as those of this year did, go through two thousand miles without necessitating the use of even one stock equipment part in the long journey.

"The entire American automobile industry has been benefited by the victory of the Thomas car in the New York to Paris race. The Thomas has beaten European cars in a race around the world and the entire world has had cause to know that America builds cars capable of performing such a feat."

PLANS FOR THE INDEPENDENTS' SHOW.

The show committee of the American Motor Car Manufacturers' Association held a meeting August 5 to perfect arrangements for the Grand Central Palace show, which is to open New Year's Eve. Four schemes of decoration were considered, but none will be chosen until the next meeting, to be held within two weeks. In addition plans were made for the allotment of space among the different classes to be represented. All the main floor and part of the first gallery will be occupied by American and foreign pleasure vehicles. On the first balcony will he the taxicab division, the commercial vehicles and motorcycles. The motor and accessory manufacturers will be on the first and second balconies. A more liberal trade ticket plan will be followed, but the plan for demonstrators will be retained.

Those present at the meeting were: H. O. Smith, chairman; R. M. Owen, D. J. Post. Benjamin Briscoe and Alfred Reeves. E. Rand Hollander, representing the importers, is at present in Europe arranging for the foreign exhibits.

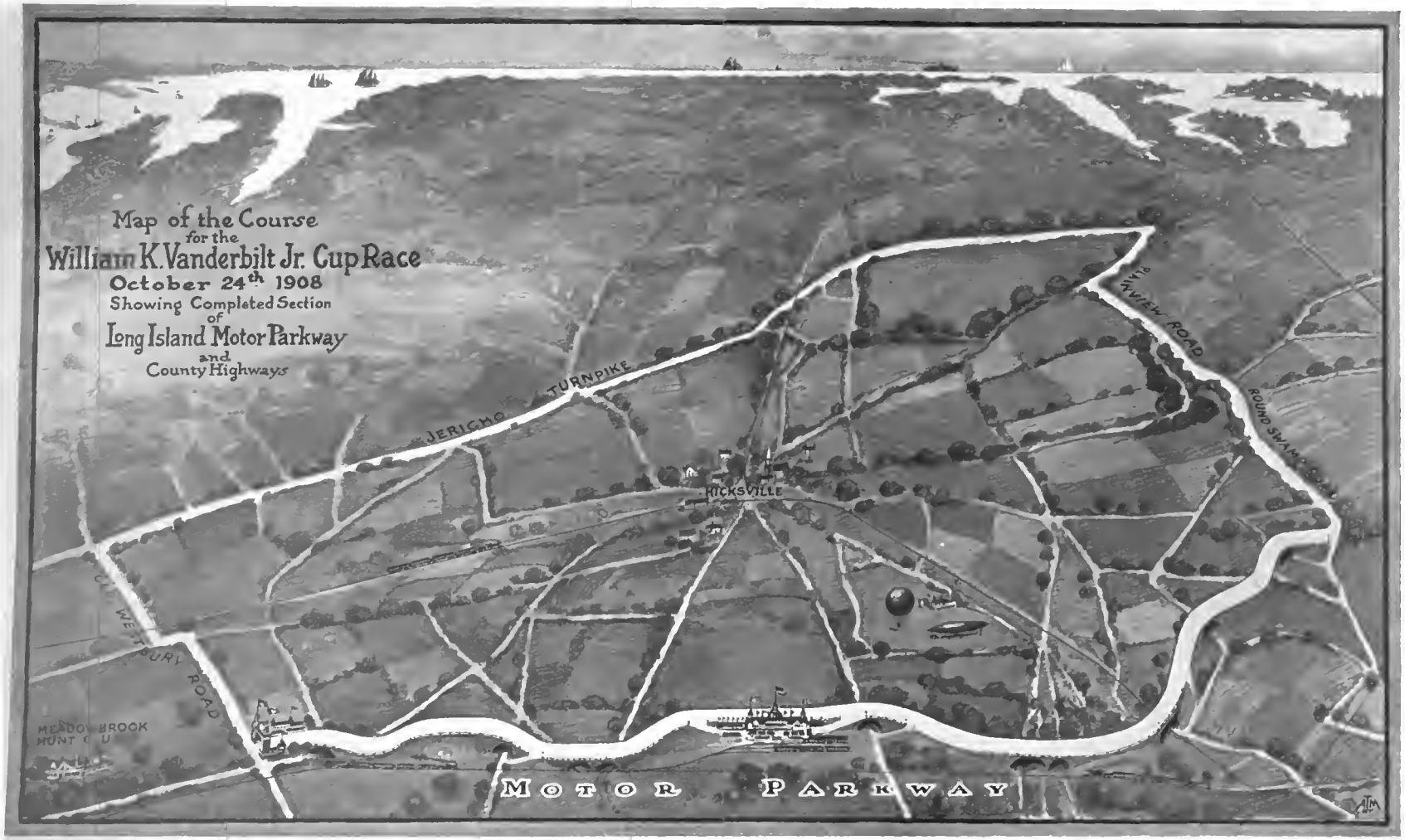
Locomotive Motor Cabs in Philadelphia.

TAXICABS INTRODUCED IN PHILADELPHIA.

PHILADELPHIA, Aug. 10.—Taxicabs are now in service at the hotels and railroad stations of Philadelphia. At the formal opening of the system President Claude S. Jarvis, of the Quaker City Cab Company, took Mayor Reyburn and two score other notables on a short run and afterwards entertained them at luncheon. The cahs are of the American Locomotive Company's make, finished in dark hrown with yellow running gears. They were well tested on the opening day, many of them carrying six persons over some very rough roads, but no mishaps marred the celebration.

OLDFIELD DRIVING A STEARNS.

LEXINGTON, KY., Aug. 10.—Barney Oldfield and Charley Soules, his mate, opened the eyes of the farmers and horse breeders at the Blue Grass Fair to-day by putting up miles in 59 1-2 and 59 3-4 seconds, respectively, in their Stearns racing machines. These figures both beat the State and track records. Barney in a three-mile match beat out Charley in 3:17. An Oldsmobile, driven by Phil Barnes, walked away with the two-mile race for fully equipped cars.



THE cement portion of the new Vanderbilt course will be 28 feet wide; crossing all intersecting railroads and highways overhead by cement viaducts, now in course of construction. These viaducts and bridges are the most expensive portions of the new motor highway. They must be fully 20 feet above the level of the intersecting dirt and railroads. The approaches must be tapered down so that the racing cars can take them at full speed. All of the turns on the cement highway are symmetrically rounded and banked, permitting a maintenance of the speed attained on the level stretches.

Round Swamp road, which runs north, on a slight grade, to the beginning of the Plainview road. Following this road the car continues on north to its intersection with a new extension of the Jericho turnpike. At this point the course bends directly west, around what has been dubbed the "Flatiron Turn." The cars have a very speedy stretch, nearly all down grade, westward along the Jericho turnpike extension to Jericho, one of the turns on the 1906 Vanderbilt course. From there the new course is over the old Jericho road to its intersection with the old Westbury road, thence south across a

BUSY PREPARING FOR THE VANDERBILT CUP RACE

NEW YORK, Aug. 12.—With the return of Jefferson deMont Thompson, chairman of the A. A. A. Racing Board and Vanderbilt Cup commission, from a brief vacation spent in touring New England, preparations for the Vanderbilt race have received an appreciable impetus.

Mr. Thompson is confident from correspondence and assurances he has received from manufacturers that the arrangements the commission has made for the elimination trial will not have been made in vain. Previous experience with the Vanderbilt race and the Glidden tour have invariably shown a tardiness in making nominations, the last day, as a rule, bringing the majority. Though the entries for the cup race will close on September 1, chance is given makers who later decide to enter the lists to secure the privilege of starting by the payment of a double entry after that date, up to October 1.

Chairman Thompson, General Manager Pardington, of the Long Island Motor Parkway, and other A. A. A. officials are co-operating with the Nassau county supervisors in their efforts to enforce the speed laws on the roads of that county. The conference at the Mineola court house was the outcome of the commission's pledge to back up the Nassauvians in the matter by way of showing well deserved reciprocity for their liberal-mindedness in granting the use of their highways for the cup race and the practice and elimination trials incident thereto.

It is probable that practice on the new course will be permitted candidates for the elimination trial by the Nassau supervisors between sunrise and 7 o'clock in the morning after October 1. There will be, however, no let-up in the crusade that is about to be started against speeding on the county roads. Drivers of non-competing cars violating the laws in this respect will be arrested by the special motorcycle "cops" to be put on permanent duty, and so will also drivers of cup cars who exceed the speed limit outside of the hours set apart for the practice.

Big Demand Early for Grand Stand.

A big demand is already in evidence for Vanderbilt race boxes on the mammoth grandstand, which is to be built on the cement racing stretch at the starting and finishing point. So large has it been that the cup commission has decided to lease the limited number of front row boxes only to persons who will take them both for the elimination trials on October 10 and the race on October 24. A. R. Pardington has issued a warning against purchasing boxes and seats from any persons claiming to be erecting stands along the motor parkway, inasmuch as the cup commission has secured control of the land on both sides of the cement stretch to prevent spectators from locating outlaw stands. He says it will be impossible to get from such stands any extended view of the race or any details until long after it is over, since all telegraph and telephone wires will be under the control of the commission.

The race will start, as usual, soon after daylight, and the grandstand, which is to be located on a portion of the new cement way, where the spectators are afforded the finest view of the cement course, will be reached directly by special trains on the Long Island Railroad. A branch of this road runs directly from Long Island City to Garden City, which is about four miles west of the beginning of the course. Although the regular trains do not run below Garden City at present, the tracks are in good repair as far as Bethpage, which is the eastern terminus of the parkway, and the railroad company proposes to run sidetracks to the rear of the grandstand.

It may be possible for visitors to the race from a long distance to take a sleeping car at Long Island City on the night preceding the race and remain in it on the grandstand sidetracks until the racing cars are called to the line at daylight.

Never before have such complete arrangements been made for the accommodation of visitors to an automobile race. There will be 11 miles of elegant parking space on either side of the cement way, under the control of the Cup Commission. Heavy steel wire fences will line the parkway from beginning to end, so it will be impossible for cars to pack at any particular spot. They will be admitted at the Whaleneck avenue entrance, which is the eastern entrance and beginning of the parkway, and lined single file, in accordance with the official parking space diagrams. These spaces, together with boxes and seats in the grandstand, may be obtained by application to Jefferson deMont Thompson, chairman of the Vanderbilt Cup Commission, at the offices of the American Automobile Association, 437 Fifth avenue.

Acme Six-Cylinder for Vanderbilt Cup.

Formal entry of a six-cylinder Acme has been made for the Vanderbilt Cup race. It is nominated by the Acme Motor Car Company, of Reading, Pa., and will carry the colors of one of the Pennsylvania clubs affiliated with the American Automobile

Trio of Packards Trying the Motor Parkway Curves.

Association. This company made its début in the road racing game at the Savannah meet last March. Its car, which was also of the six-cylinder type, finished third in the big race for the Savannah cup, despite the fact that its pilot was inexperienced in the racing game and drove his machine on a rather conservative time schedule. Who will be its pilot over the Long Island course has not yet been determined, though negotiations are in progress with several racing drivers of repute.

The racer will have a six-cylinder motor with five-inch bore and five-inch stroke. It is conservatively rated 60-horsepower at 1,000 r.p.m., but has been tested to upwards of 1,800 r.p.m. The cylinders are cast singly, with valves on opposite sides. The wheelbase is 116 inches, and the wheels, front and rear, are 36 by 4 1-2 inches. The gasoline capacity will be about 40 gallons, and the tank will be directly back of the driver's seat. The car is so far advanced toward completion that much road testing of it is expected to be accomplished before the close of the present month.

Entries of two Locomobiles and two Thomas racers are indicated in the next few days.

PROPERLY TIMING MAKE-AND-BREAK IGNITERS

THERE is much more involved in the successful operation of the make-and-break ignition system than simply correct timing of the break and proper insulation of stationary electrodes. In addition to these primary requirements are the following: *A*—The contact must have a sufficiently long dwell to permit the current to build up in the armature winding or the spark coil; *B*—The contact points, if of steel, must be reasonably clean and comparatively free from oil; *C*—The rocking electrode must not be worn so loose in its bearing that the moment of break or the certainty of good electrical contact can be affected by its wabbling; *D*—The adjustable rods or stems actuating the igniters must be true and free in the cupped ends of the outer rocking arms. Fig. 1 shows approximately the customary section of the igniter cam. It will be seen that both the lifting and the descending faces are angular. In other words, contrary to the common practice in marine and stationary engines, it is not what is known as a "snap" cam. The object of this is to permit the cam to turn backward in case of a back kick without damaging the mechanism and without the complication of a trip finger. The effect of this angular descent is to make the precise moment of rupture a matter of some importance, since the arc traveled by the crank during the roller's descent is double the arc *A*. As is evident from the

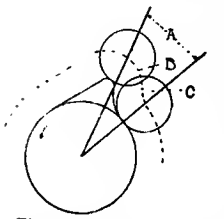
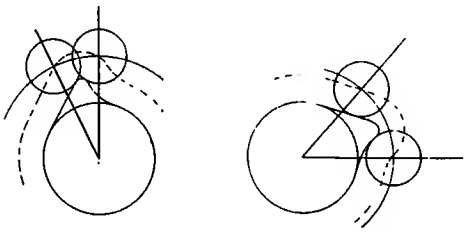


Fig. 1—Customary cam profile for low-tension ignition.



Figs. 2 and 3—Illustrating difference in endurance of contact of two cams.

dotted line indicating the path followed by the center of the roller, the movement of the roller is slow at the top of the cam, and consequently the spark produced if the break occurs, *e.g.*, with the center of the roller at *B*, is not as strong for the same flow of current as it would be with the roller *C*. Again, contact is made when the roller is at the same distance from the center of the cam as on the break, and the dwell in contact is therefore comparatively short in Fig. 2 and much greater in Fig. 3, as the angles shown in dotted lines indicate. It is easily possible for the dwell to be too short to produce an effective spark, and when a magneto is the source of current it is a safe rule that the electrodes shall make contact during at least the upper half of the cam's lift.

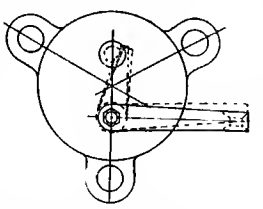


Fig. 4—Effect of wear on the time of the break.

If the contact points are of iridio-platinum they will wear very slowly, and the spark time will be but slightly affected by their wear. If, however, the contacts are steel they will burn away rather rapidly. This has the effect of changing the position of the outer arm of the igniter as shown in Fig. 4, and both reduces the dwell and causes the break to occur earlier than before. The rate at which this progressive change in timing goes on will depend partly on whether the magneto or battery is used, being usually greater with the latter, and on the area of the surfaces in contact, being obviously greater when the available surfaces are small. An insulated stem which has been in use for some time and has been turned repeatedly to bring fresh surfaces in contact assumes finally a form resembling that at *A* in Fig. 5, and the contact finger has probably acquired the shape shown at *B* in the same sketch. When this condition is reached, if the contacts are continued further in service, it is probably necessary to change the angle of the outer arm owing to the limit of the igniter rod's adjustment having been reached. This arm usually is a taper fit on the rocking stem, and a little careful trial will establish a suitable position for it. It is essential occasionally to file the contacts clean and smooth, and at more frequent intervals to polish them with emery cloth to remove the burned scale which forms on their surfaces.

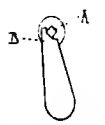


Fig. 5—How the contacts wear away.

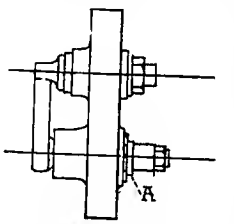


Fig. 6—Correcting a tendency to shake.

In case the rocking stem wears loose and shows a tendency to wabble, it may be kept fairly steady by inserting a washer at the outer end of the bearing as at *D* in Fig. 6. It should be remembered that the wabbling tendency is chiefly promoted by the igniter rods themselves being crooked and bearing sidewise against the rocking arms. This has a further objection in that the friction of the rods against the arms on the first downward movement is more or less liable to cause a premature break. The rods should be guided entirely from below and should exert no pressure whatever against the igniter arms except in the vertical direction.

The synchronizing of igniters is most easily and accurately done with the aid of one or two cells of battery and a voltmeter. If the battery is part of the standard reserve equipment it is not necessary to make any change in the connections, except to break the connection from the switch to the bus bar and insert the voltmeter. Then the spark lever is fully retarded and the flywheel turned to one of the dead positions, which are usually marked on it. This position should be the breaking position for whichever igniter is in action at that instant.

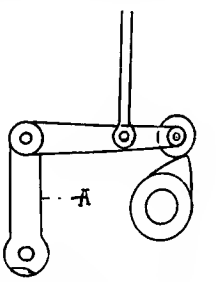


Fig. 7—Bent arms may cause loss of synchronism.

While contact is established the voltmeter will indicate the fact, and the instant contact is broken the needle will return to zero. Adjust the igniter rod up or down until on two or three successive trials the break occurs at exactly the right point, and see that tightening the locknut on the igniter rod does not change this adjustment. Turn the crank again and watch carefully the movement of the igniter rod after contact is made. If it does not move up half its total travel after contact is made, take off the igniter plate, slacken the taper fit of the outer arm on the rocking stem, and turn the arm very slightly downward. Replace the igniter plate and readjust the igniter rod. When the first cylinder has been satisfactorily timed, take the second, and so on. It is best to cut out all the cylinders except the one under test.

If the advance and retard follow Mercedes lines, as in Fig. 7, it is possible that a back kick may have bent some of the arms *A*. This is tested by turning slowly and noting if all the rollers begin their ascent or descent at the same crank position. If not, they must be made to do so by bending the arms, *A*, otherwise the timing will be for one position of advance only.

HOW THE CLUBS ARE DOING EFFECTIVE WORK

HARTFORD CLUB DOING GOOD SIGN WORK.

HARTFORD, CONN., Aug. 10.—One of the chief activities of the Automobile Club of Hartford at the present time is the sign-posting of the Connecticut roads in different parts of the State, so that the members of the sign post committee are now the busiest in the club. As is the case in a great many States, the roads in Connecticut came from nowhere and led to nowhere else until the local club undertook the work of putting up appropriate signs for the benefit of the visiting autoist, as well as the resident, for many of the latter could be lost on their own roads, so complete was the lack of information. The work will be continued until all the principal routes are posted.

Preparations are now under way for the hill climb to be held under the auspices of the Automobile Club of Springfield, September 11. C. H. Gillette, vice-president of the Automobile Club of Hartford, has been requested to act as referee and has consented to do so. It is confidently predicted that the hill climb will be one of the largest and most successful ever held in Connecticut, as all the famous climbers have promised their entries.

COUNCIL BLUFFS TO HAVE A CLUB.

COUNCIL BLUFFS, IA., July 31.—A meeting was held recently by a number of automobilists of this city to consider the formation of an automobile club, to be affiliated with the American Automobile Association. The organization would act in conjunction with similar bodies at Davenport and Mason City, Ia., to form a state association. The meeting was presided over by M. Woolman, president of a club formed here several years ago. Dr. T. B. Lacy, Dr. Jeffries and T. S. Davis were appointed a committee on organization.

HARRISBURG CLUB ERECTING SIGNS.

HARRISBURG, PA., Aug. 10.—The Motor Club of Harrisburg has recently appointed a special sign board committee consisting of J. Clyde Myton, James McCormick, Jr., and Dr. John Oenslager for the purpose of placing sign boards along all the important roads entering the capital city of Pennsylvania and especially mark the short route running from this city to Gettysburg. The club has appropriated $150 for the sign board work and work has already been started.

The Motor Club will hold an economy contest over the asphalt streets of the city next Saturday to show just how much mileage can be secured on a gallon of gasoline from various cars in their daily use in the city. Later in the month a similar contest will be held over country roads to show the relative use of fuel between city streets and country roads.

GYMKHANA FOR ROCHESTER AUTO CLUB.

ROCHESTER, N. Y., Aug. 10.—The Rochester Automobile Club will hold its annual gymkhana at Genesee Valley Park Saturday, August 15. There will be twelve events, including the usual obstacle, potato and speed-judging races, and several new and original contests which are expected to provide much amusement. The club is extending its activities in many other directions as well. Tuesday, August 11, will be Orphans' Day, and 140 cars are expected to come out to give the city's charges a run to Ontario Beach. Road signs are being placed on the roads leading to Syracuse. Nearly fifty members have taken advantage of the club arrangements with the Canadian Custom House and are touring in that country. The total membership of the club is now 504, and it is still rapidly on the increase.

"Jersey Justice" as Depicted by "Motor Record," the Official Organ of the New Jersey Automobile and Motor Club.

CHAS. B. SHANKS, STEARNS' SALESMANAGER.

CLEVELAND, O., Aug. 10.—Charles B. Shanks has just been appointed salesmanager of the F. B. Stearns Company and will immediately enter upon the new duties of his office with the latter concern. He will still continue as the head of the Shanks Selling Company, the firm which he organized immediately upon severing his relations with the Winton company, and in addition to the Chalmers-Detroit line, which he took on for northern Ohio at that time, he will also sell the Stearns cars at retail in Cleveland and vicinity.

Charles B. Shanks.

For the last ten years Mr. Shanks has been the manager of the advertising and sales departments of the Winton Motor Carriage Company, of the same city, and during that time he has made himself one of the best known salesmanagers in the industry the country over. The forcefulness and energy of his methods have accomplished much in the selling line, while his personal geniality has won him a host of friends, so that it is not at all strange that his stepping into the retail field came as a great surprise to all who knew him nor that other companies should immediately bid for his services. He has a fund of knowledge concerning the necessary ways and means for successfully marketing a factory's product that is possessed by few and which it seemed a pity not to give some enterprising company the benefit of.

As a result of this latest move the Shanks Selling Company, 1526 Euclid avenue, Cleveland, will be in charge of R. H. Williams, formerly manager of the Winton branch at Baltimore, and the company will handle the Stearns line at retail in connection with the Chalmers-Detroit. The cars do not conflict in any way, and the combination is regarded as an excellent one. As an assistant manager in the sales department of the Stearns Company, Mr. Shanks will have Hal Sheridan, who has been prominently connected with the White Company for a number of years past.

President Frank B. Stearns, of the Stearns Company, in discussing the new Stearns-Shanks combination, said: "We are very glad that changing conditions made it possible to take Mr. Shanks into our company and to turn over to him the disposal of our output. We have wanted him for a number of years, but his resignation from the Winton Company gave us the first chance we ever had to bid for him."

RENTING DEPARTMENTS PROVING VALUABLE.

Harry S. Houpt, of New York, has started a Thomas Flyer renting agency. Though run from the Harry S. Houpt Company's headquarters, it is a private enterprise of Mr. Houpt, who says he will start the service with five cars and will furnish neatly uniformed chauffeurs.

In this connection it is to be noted that not a few agencies maintain rental departments either directly or indirectly connected with their selling agencies. They not only furnish a profitable haven for shop-worn cars and cars taken in exchange, but make it conveniently possible to furnish temporary employment to chauffeurs, thus affording at all times trusted and competent pilots for purchasers and customers.

One prominent New York branch, which conducts a rental department under an independent name, turns over to it the exchange cars and charges their cost against their maintenance for a year. A car taken in exchange at $1,500, for instance, would have $125 per month charged against it for one year. Despite this conservative book-keeping, the department, besides the advantages it otherwise affords, yields a good profit.

DETROIT CONCERNS BUSILY OPTIMISTIC.

DETROIT, Mich., Aug. 10.—If any injurious effects from the recent industrial depression remain they are not in evidence among local automobile factories. Never before in the history of the industry have Detroit concerns faced a more favorable outlook than at the present time. From all quarters come optimistic reports, backed up by figures that do not exist solely on paper, but represent real money. The question now confronting makers is how to handle the business that is coming their way, with a rush unlooked for even by those who had planned most carefully. This may be accounted for in part by the introduction of several high-grade models at a lower price than hitherto prevailed, and the switch of one concern to the licensed ranks, bringing it in touch with agencies that open up a field that was not available under old conditions.

With one of the most spacious plants devoted to the production of automobiles, and with facilities that were supposed to be ample for all time, the Packard Motor Car Company has been forced to greatly increase the size of its factory, owing to inability to expeditiously handle the constantly growing demand. Two more concrete and brick additions are to be added at a total cost of $100,000. They will give 150,000 square feet more floor space and enable the company to increase its working force from 2,500 to 3,000. Another building is also under consideration.

Things are humming at the Cadillac plant, where the new Cadillac "30" will soon be coming through in great numbers. At the Chalmers-Detroit plant conditions are similar, the new "30" keeping everybody on a jump, in addition to the present Chalmers-Detroit car which has proved so popular.

Still another "30" that is making things lively is the Everitt-Metzger-Flanders car, preparations for producing it in great numbers going forward rapidly. The Ford Motor Company is, of course, keeping up the pace that has made it famous. The Brush Runabout Company, the De Luxe, Aerocar and other plants are all in a prosperous condition and the sun once more shines on both sides of the street so far as local automobile makers are concerned.

DEATH OF CHARLES G. HUNTINGTON.

HARTFORD, CONN., Aug. 10.—Charles G. Huntington, for many years advertising manager of the Electric Vehicle Company, of Hartford, died at his home in this city on the morning of Saturday, August 8. He had been in poor health for the past few years, but remained at his desk until a year ago. Previous to his connection with the Electric Vehicle Company, he was advertising manager for the Pope Manufacturing Company, and before that was a teller with the Connecticut River Banking Company, and one of the editors of the *American Cyclist*. During the heyday of cycling he was prominently identified with League of American Wheelmen affairs in Connecticut, and was at one time chief consul of the Connecticut division. At this period of his career he compiled the first road book of Connecticut, which met with a wide sale.

Mr. Huntington always took an active interest in the city government and served on both the fire and the police commissions. He also did very efficient work on the school district commission. In politics he was a Democrat. He was of a genial disposition and of the sort that readily made friends, and in the old days at the Electric Vehicle Company "C. G.," as he was familiarly called, was the soul of many a gathering. He had a wide acquaintance with the advertising men, who hold him in the highest esteem. During the past two years of his life he suffered much, but even this was not sufficient to dim his sunny disposition. His was a nature that will be missed for a long time to come, and in his death the industry loses a familiar figure. He was a member of Hartford Lodge, F. A. M.

A. L. A. M. ADOPTS STANDARD DETACHABLE RIM.

ACTION on various matters of importance was taken by the Association of Licensed Automobile Manufacturers at its general meeting held in New York, August 6. It embraced the election of a successor to H. H. Franklin, whose resignation as treasurer was tendered after three years of service and accepted. Col. George Pope was unanimously chosen to fill the vacancy.

After many months of negotiation by the rim and tire committee, a quick detachable rim was at last adopted on its recommendation. It will be known as the "Standard universal quick detachable," and is the same rim as was under discussion at the N. A. A. M. meeting the previous day and pronounced satisfactory. The Mechanical Branch of the Licensed Association has been working on the rim situation for the past year and felt the need, both for the individual users and automobile manufacturers, of a standard quick detachable rim, which would take both a clincher and quick detachable shoe of any make, thus minimizing the existing inconvenience of having to have a shoe of one make to fit a given rim. After experimenting with all the quick detachable rims, co-operation with the tire and rim makers resulted in the adoption of this rim, which is the result of hard and persistent efforts on the part of the tire and rim makers to get something that would be adopted by all manufacturers, both in and out of the association.

M. J. Budlong and R. D. Chapin were added to the rim and tire committee, whose chairman is A. L. Pope.

The report of the show committee was approved. Accordingly at the next general meeting, which is likely to be held early in September, awards for space for the Madison Square Garden show will be made. It was recommended that the usual method of allotment be adopted, which is according to the amount of business done from July 1, 1907, to July 1, 1908 by the various bidders for space.

The report of the handbook committee was accepted, and work on the 1909 handbook will begin at once, as several of the members have already forwarded photographs and specifications for the sixth edition of this book.

Those present were: M. I. Brock, Autocar Company; W. C. Durant, Buick Motor Company; W. C. Leland, Cadillac Motor Car Company; R. D. Chapin, Chalmers-Detroit Motor Company; M. S. Hart, Corbin Motor Vehicle Corporation; E. R. Hewitt, Hewitt Motor Company; A. N. Mayo, Knox Automobile Company; S. T. Davis, Jr., Locomobile Company of America; V. M. Gunderson and W. E. Metzger, Northern Motor Car Company; F. L. Smith, Olds Motor Works; M. J. Budlong, Packard Motor Car Company; L. H. Kittridge, Peerless Motor Car Company; Charles Clifton, George N. Pierce Company; George Pope, Pope Manufacturing Company; G. E. Mitchell, Alden Sampson, R. H. Salmons, Selden Motor Vehicle Company; F. B. Stearns, F. B. Stearns Company; I. H. Page, Stevens-Duryea Company; A. W. Church and O. G. Bechtel, Waltham Manufacturing Company, and Thomas Henderson, Winton Motor Carriage Company.

INTERPRETING THE OHIO LAW.

TOLEDO, O., Aug. 10.—The attorney-general's office of the State of Ohio has just rendered a decision under the Ward automobile law which will greatly increase the revenues derived under that act, to say nothing of causing corporations to secure chauffeur licenses for all of its employes who run any automobiles or autotrucks such corporation may have. The Ward law provides that an owner of a machine may run it without a license, but in its opinion the attorney-general's office holds that because one owns stock in a corporation, he is not an owner of any automobiles said corporation may own, and to run such automobile the driver must have a license; the same law covering any employes whose duties may be to run such machines or trucks.

STUDEBAKER AND E.-M.-F. SALES COMBINATION.

SOUTH BEND, IND., Aug. 10.—The latest combination in the American automobile industry is that of the sales departments of the Everitt-Metzger-Flanders Company, of Detroit, and the Studebaker Automobile Company, whose factories are located in this city. In other words, William E. Metzger and Hayden Eames, manager of the Studebaker Company, will co-operate in marketing the proposed output of 12,000 E.-M.-F. cars, the American territory being divided between them. The Studebaker concern has contracted to sell 6,000 of the E.-M.-F. cars through its large and effective sales organization, comprising eight branch houses and fully 5,000 retail dealers, and will have exclusive control of the foreign business, its export interests being very large in all parts of the globe.

"We are highly pleased at its consummation and frankly believe it will prove to be the most important move that has been made in the automobile business," said Colonel George M. Studebaker, when asked to verify the report. "We considered it more advantageous to us to form an alliance with a group of men such as that comprising the Everitt-Metzger-Flanders Company, possessing as they do factory facilities, experience and manufacturing ability of a rare order, as well as an intimate knowledge of the problems peculiar to the motor car, than to establish a separate factory of our own.

"It has long been our intention to go into the marketing of cars on a large scale. The chief factors which have deterred us until now were: First, the unsettled state of the market; second, the expensive and wasteful sales methods, which, in our opinion, made the business an unsafe one, and, last but not least, the lack of stability in design which rendered the making of a large number of cars of any one type a risky business. These conditions having changed, we decided the time was ripe. The Studebaker sales department and the E.-M.-F. manufacturing organization should prove a strong combination.

BRUSH RUNABOUTS' TRIUMPHAL PROGRESS.

With the sole purpose of demonstrating that the lowest-priced automobile on the American market to-day is likewise an economical and practical motor vehicle, the Brush Runabout Company, Detroit, Mich., started four of their new Model B runabouts, selling at $550, and one of their little 500-pound delivery wagons, listing at $600, from that city on August 1, on what they term "a 1,500-mile efficiency run." The cars were all dispatched at the same time, leaving the factory on a Saturday afternoon, and each striking out on a different course. Car No. 1 is bound for New York and Boston, and successfully reached the headquarters of the Brush-McLaren Company, 47 William street, Newark, N. J., last Tuesday. It remained in that city for a few days in order to demonstrate its fitness after the long run to a number of interested autoists, and then proceeded into New York, where the same procedure was gone through. Following this, it again struck out on the last leg of its journey to Boston, which will be reached some time next week, as the cars are all proceeding by roundabout routes in order to be able to make demonstrations in as many cities along the way as possible.

Of the others that left Detroit at the same time on similar missions bound, car No. 1 is on its way to Philadelphia and Washington, while car No. 2 is well along on the trip to Kansas City, Mo. It will not stay there as the end of its journey, but will continue on to Denver and take a try at Pike's Peak. Car No. 4 is bound for Minneapolis, while the delivery wagon, which is Brush car No. 6, will make the round trip between Milwaukee and Detroit. Deducting the time necessary for demonstrations, the cars have been averaging 80 to 100 miles a day without any difficulty, and, in every case, are ahead of the schedule mapped out for them by the Brush company before leaving the factory.

Garage of the Keystone Motor Car Company, Oakland, Cal.

San Francisco, Cal.—The new garage of the Jerome Garage Company recently opened at Polk and Jackson streets is unique in that no sales whatever are made there, the building being devoted entirely to the care of cars. It occupies nearly a quarter of a block, having on its three floors a space of 65,000 square feet. About 200 cars can be accommodated. On the second floor is a handsomely fitted up club room for chauffeurs, and also the machine shop, which is so completely equipped that it is believed an entire car could be built there without the addition of another tool. On each floor there are two turntables and two elevators convey cars from floor to floor. The establishment is in charge of Manager Eugene Silver, until recently with the McDuffee Automobile Company, of Chicago.

Cincinnati, O.—The garage built last winter by the Reliance Motor Car Company has been acquired by the Herschede brothers, who have incorporated and are continuing the business of the other concern. The building is situated in Avondale at Reading road and Maple avenue, with a 107-foot front on the former and 180 feet on the latter. The situation is very favorable, being on the usual route out from the city and in one of the best residential districts. The main floor has a capacity of about 75 cars; in the rear is a well-equipped machine shop, and in front the office, waiting room, salesroom and a small shop for drivers who wish to do their own repairing. The company will carry the agencies for several American and foreign cars.

Syracuse, N. Y.—The Utica Motor Car Company has purchased the garage of the Genesee Automobile Company at 242-252 West Genesee street, in this city, and will continue the business under its own management. The garage has a frontage of 63 feet on West Genesee street and extends back 84 feet on Franklin street; it contains ample display space, machine shops, etc., with a lounging room for chauffeurs in the basement. The company has the agency for the Peerless, Pope-Hartford and Cadillac.

Chicago, Ill.—The Rambler Garage Company, of Chicago, will erect at 1218 Sheridan road a 45-foot addition to the present garage, which already has a 100-foot frontage. The building will be three stories high and will cost approximately $20,000. The business of the Rambler Garage Company has increased to such an extent owing to the growing number of automobile owners on the north side of Chicago that it far exceeded the capacity of the present quarters.

Pasadena, Cal.—A novelty in garages is that of the Electric Garage Company, at 100 East Union street, which is devoted exclusively to electric vehicles. The building is of reinforced concrete and brick, with a floor space, including a fireproof basement, of 14,400 square feet. Pasadena has as many, if not more, electric than gasoline cars, and that means a good many, as it is said to have more automobiles in proportion to its population than any city in the United States.

Oakland, Cal.—The Keystone Motor Car Company's garage at Telegraph avenue and Twenty-second street in this city is one of the handsomest on the Pacific Coast. It was erected at a cost of $12,000, and D. C. McCord is the manager. There is a floor space of 16,000 square feet and in the well-equipped workshop six men are employed. The company is agent for the Acme, Marion and Overland.

Richmond, Va.—About September 1 the Gordon Motor Company expects to occupy its new garage, now being erected, which will be the largest and best equipped in this part of the country. The building is located on West Broad street, opposite the ball park, and will cover every foot of space on its 84 by 120-foot lot. Besides its garage business the company will have the agency for several gasoline automobiles.

Portland, Ore.—One of the most substantial and best-equipped fireproof garages in the Northwest is now the home of the Oregon Motor Car Company, R. E. Heath, manager. It is one story high, of brick and cement construction. The company makes the agency business its specialty, handling the Tourist and the Moon, and the garage is intended to take care of the company's patrons only.

Augusta, Ga.—The Augusta Motor Company is now occupying its new garage at 712 Ellis street, and will do a general garage, agency and repair business. L. M. Coward, an experienced automobile men, holds the position of general manager, and has under him several expert repair men direct from the factories. The company has the agency for the Reo, Premier and White steamer.

Kansas City, Mo.—Ground has been broken for the erection of a new garage for the Studebaker Company, to be located on Grand avenue, near Seventeenth street. Until the new building is completed the company will make its headquarters in the former home of the Auto Motor Company, at 1122-24 East Fifteenth street.

St. Paul, Minn.—The St. Paul Motor Vehicle Company has what they claim to be the finest garage in the Twin Cities. It has a frontage of 87 feet and a depth of 168 feet, of concrete construction, and up-to-date in every particular. The company has the agency for the Oldsmobile, Buick and Columbia Electric.

Washington, Pa.—Another garage has been opened in this city by Howard H. Tanner and Fred C. Berthel, the firm to be known as the Standard Auto Company. The garage is located at 29 East Wheeling street, where considerable remodeling is being done.

Lincoln, Neb.—The Nebraska Automobile and Storage Company is opening the largest garage in the State at 1226 N street, where they will handle the Chalmers-Detroit. They will carry a general line of supplies and do a renting and storage business.

Burlington, Vt.—The automobile department of the Burlington Machine and Repair Company has been separately organized under the name of the Burlington Garage Company, which will occupy new brick quarters on Mechanics street.

Little Rock, Ark.—A new garage is being planned by W. L. Tedford and some associates. It will probably be built of concrete blocks, 40x60 feet, on East Fourth street. The demand is believed sufficient to justify the investment.

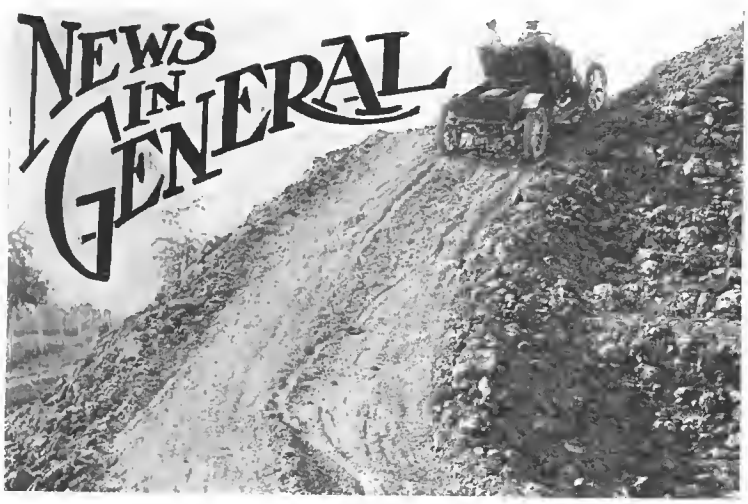
Newark, N. J.—William Bowden is erecting a garage at 401 Clinton avenue. Mr. Bowden does not intend to represent any machine, for the present at least, but will simply do a general storage and garage business.

Joliet, Ill.—A new garage, possessing all the advantages of location and equipment, was recently opened by L. J. Kinnel at 102 West Jefferson street in this city. Mr. Kinnel is the Joliet agent for the Mitchell.

Atlanta, Ga.—The new Atlanta home of the Maxwell at 34 Auburn avenue has just been opened. The new building is of brick, one story high, and of adequate size to handle the company's growing business.

York, Pa.—John Oden is the manager of a new garage in this city. The building has a frontage of 34 feet on Philadelphia street, and a depth of 58 feet, and is thoroughly up-to-date.

NEWS IN GENERAL



Packard Testers Using Embankments of Michigan State Rifle Range, near Detroit.

Packard's Novel Testing Ground.—The testing corps of the Packard Motor Car Company, always on the lookout for new hills to conquer and to use in the regular testing of Packard cars, recently discovered and obtained the privilege of driving on the embankments of the new Michigan State Rifle Ranges, near Detroit. These embankments, or butts, as they are called in military parlance, are clay and gravel hills, 40 feet high, with stiff grades, the steepest of which is 45 per cent. They form an ideal hill-climbing test under ordinary rough road conditions. The construction company men, and afterwards the United States troops using the ranges, were much interested in the way in which a dozen cars at a time were driven over the hills, some from one side and some from the other. The Packard testers are now busy on 1909 cars, of which approximately one hundred have already been delivered to purchasers. The factory is running a full force of 2,500 men and this is being increased each week. When two additions now under construction are completed, the number of employees will be larger by several hundred.

Diamond Tires Around the World.—The Diamond Rubber Company, Akron, O., on the completion of the round-the-world race, received the following telegram from the E. R. Thomas Motor Company, of Buffalo, N. Y.: "In New York to Paris race not only an American car but also American tires scored important triumph. Diamond quick detachable tires on the Thomas car gave excellent service. Not only did the casings withstand hard usage to an almost incredible degree, but the tubes of the same make showed equally good results. At no time was the Thomas seriously delayed by tire trouble, and it is safe to say that every known species of road in the world was encountered save those of the tropics.

"Wag" Comes a Cropper.—Fred J. Wagner was unavoidably detained from business on Monday last through being mixed up in a little auto accident of his own. He was out in his car Sunday with his son, Fred J., Jr., in the driver's seat, and his wife in the tonneau. While making good time along Jerome avenue, New York, young "Wag" was seized with vertigo and fainted. The car swerved and ran into a telephone pole, throwing all three out. "Wag" sustained a cut on his leg, which required several stitches; Mrs. Wagner was cut about the mouth, and Fred, Jr., was a bit bruised.

Pullman Increases Capacity. — The York Motor Car Company, of York, Pa., makers of the Pullman cars, have made changes in their plant which will more than double its capacity. The main building had, until the present time, been divided between the production of carriages and automobiles, but the growth of the latter business made it necessary to move the carriage plant away, and the whole building is now devoted to the making of autos.

Trade's Summer Capital in Maine.—Christmas Cove, Me., has some excuse this summer for putting on airs as a bit of an automobile trade summer capital, since it will harbor for several weeks to come S. A. Miles and Alfred Reeves, respectively, general managers of the N. A. A. M. and the A. M. C. M. A., and Robert Garden, manager of the Harrolds Motor Car Company, New York agents for the Pierce.

New Body Builders.—The Fischer Body Company has purchased the plant of the Gier planing mill on St. Antoine street, Detroit, Mich., and will commence operations there at once. A two-story building, 250x50 feet, will be erected for use as a mill room and dry kiln. The new company is capitalized at $50,000, and will engage in the manufacture of automobile bodies.

Webb Jay Steamer Appears.—Webb Jay appeared on the Chicago automobile row a few days ago at the wheel of a 1909 Webb Jay steamer, which looked good to many of the experts. He has disposed of his entire allotment of Stanley steamers and Kisselkars, and will devote much of his time to the interests of his new production.

Gun Makers in Line.—The Driggs-Seabury Ordnance Corporation, of Sharon, Pa., has decided to go into the manufacture of automobile parts, especially pressed steel work. Ground will soon be broken for a $50,000 addition to the present plant, to be devoted to this branch of the business. Employment will be given to about 75 skilled men.

Franklin "Farthest North."—A party from Conneaut, O., recently made a run to their summer home at Dorset, Ont., in a Franklin automobile, penetrating far into the Canadian forests. The last part of the journey was made over mere tracks in the woods, through country never before traversed by an automobile.

Atlas Builds Addition.—The Atlas Motor Car Company, of Springfield, Mass., has just let the contract for the erection of a new building 150x50 feet, three stories in height, which is to be completed by October 1. Considerable new machinery will be installed.

Packard Addition Progressing.—Work is progressing rapidly on the addition to the Packard Motor Car Company's plant at Detroit, Mich. When the new buildings are completed they will give the factory an additional area of 150,000 square feet.

IN AND ABOUT THE AGENCIES.

Cork Inserts.—The Standard Brake Company, formerly of 101 West Sixty-sixth street, New York, which has for several years assisted the National Brake and Clutch Company in negotiating licenses with automobile manufacturers to use cork inserts for automobile purposes, has retired from business owing to death and changes in the personnel of the company, and all further communiations regarding the use of cork inserts in clutches, brakes or pulleys should be sent to the patentee, the National Brake and Clutch Company, 16 State street, Boston.

Winton.—Owing to the development of Winton trade in Minnesota since Johnny Johnson took charge last spring rendered the temporary quarters altogether inadequate and forced the company to look about for a new situation, with the result that the Minneapolis branch will soon be housed in its new building on Eighth street north, near Hennepin avenue.

Gyroscope.—A. L. Kull has just occupied a four-story brick building on Fifty-fourth street, west of Broadway, and will make it the New York headquarters of the Gyroscope Automobile Company.

Thomas.—Announcement has been made that the Walden W. Shaw Company has relinquished the Buffalo, N. Y., agency of the Reo and Premier and taken on the Thomas Flyer.

Warner Autometer.—W. H. Halliwell, who has the Los Angeles agency for the Warner Autometer Company, is making preparations to establish a branch in San Francisco.

Chalmers-Detroit.—Frank J. Fanning, formerly of the Chicago firm of Levy and Fanning, has been appointed agent for the Chalmers-Detroit in Indianapolis, Ind.

Pierce-Arrow.—The Foss-Hughes Motorcar Company, which has the agency for the Pierce-Arrow in Philadelphia, is preparing to open a branch in Baltimore.

Pope-Hartford.—The Crescent Auto Company, of Jersey City, N. J., has been appointed agent for the Pope-Hartford in northern New Jersey.

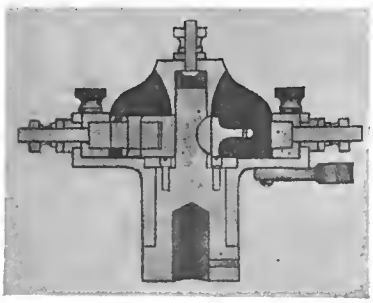
PERSONAL TRADE MENTION.

L. A. Hopkins, for some time past manager of the St. Louis Car Automobile Company of New York, which is the metropolitan branch of the St. Louis Car Company, builders of the American Mors, has severed his connection with that concern, his resignation having taken effect at once.

C. H. Gage, who for several years past has been the manager of the Cleveland branch of the Fisk Rubber Company, has been promoted to the assistant sales-managership of that company, and left yesterday to take up his new duties at the factory at Chicopee Falls, Mass. Mr. Gage is succeeded in Cleveland by C. H. Collins, formerly manager of the Denver branch.

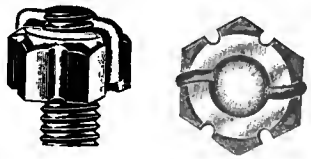
INFORMATION FOR AUTO USERS

Roberts Timers.—That well-known firm of electrical instrument makers for automobile use, the Roberts Instrument Company, 56 Shelby street, Detroit, Mich., has recently placed on the market a line of timers for both marine and automobile service. The instrument is simple and reliable, besides being very well built, solid brass being employed for the case while the bearings are of the finest steel. This, together with the extra length and bearing surface of the shaft sleeve, insures permanent alignment and makes the timer very durable. The illustration shows a sectional view of the Roberts timer, from which an idea of its simplicity and the small number of parts necessary may be gained. The timer is designed to operate clockwise, but should the requirements of the case make this out of the question, it is easy to reverse its direction of rotation merely by removing the brush and inserting it so that it will run in the opposite direction. This makes it adaptable to any motor without any trouble. For automobile use it is made in two sizes, three and four inch, the latter being intended for the heaviest service, while the smaller one is intended for light cars. The marine timer is equipped with quadrant and lever as well as a ground wire attachment.



SECTIONAL VIEW OF ROBERTS TIMER.

Victor Lock Nut.—One of the chief causes of trouble on automobiles of earlier days was the constant loss of parts, small in themselves, but often of vital importance to the machine, which loosened up and dropped off owing to the constant vibration and shaking. To remedy this source of difficulty, innumerable methods have been devised of locking nuts and bolts in place but many of them have fallen far short of accomplishing the purpose for which they were devised. Realizing the shortcomings of many of the lock nuts on the market, the Walker Brothers Company, 21-25 Walton street, Syracuse, N. Y., brought out the Victor lock, two views of which are shown by the accompanying illustrations. Among its advantages, the makers cite the following: "It is a positive lock between the bolt and the nut; it is locked easier than a castled nut; has possibilities of adjustment possessed by no other positive lock nut as it is locked after the nut is home in its place; it can be unlocked, adjusted and relocked without removing, and it can be removed without injury to the lock or bolt; it is a time saver in assembling and can be manufactured at less cost than any similar positive lock." As shown by the cuts, it does not depend upon a spring or compression for its action, nor is an extra nut necessary. When in use there are no protruding prongs and no cotter pins sticking out.



VICTOR LOCK NUT AND ITS FASTENING.

Victor Clutch Compound.—Very often an apparent loss of power that the motor is apparently responsible for may be traced to a slipping clutch, and there are few things more aggravating than to have the car slow down on hills or where the going is hard, merely because the clutch fails to transmit the power to the rear wheels. Everything imaginable has been tried by autoists to overcome this tendency, but few of the substances employed have the desired effect for any length of time, or tend to improve the condition of the leather facing of the clutch. An expert repair man, after considerable experimenting, discovered a compound which would do the work, and after having put it to hundreds of tests it has been put on the market as the Victor clutch compound and is being manufactured by the Victor Clutch Compound Company, Nashua, N. H. It has proved its merits for this purpose conclusively and is also well adapted for other uses where friction surfaces come together, as in brakes, motorcycle belts and the like. It is put up in oiler top cans and being a liquid is convenient to apply exactly where it is wanted.

VICTOR CLUTCH AND BRAKE COMPOUND.

Dayton Airless Tire.—As its title indicates, this is a tire designed to do away with the use of compressed air, and accordingly to eliminate the numerous worries and troubles attendant upon the use of the pneumatic. So far as its external appearance is concerned it closely resembles the ordinary pneumatic, but there the similarity ends. Instead of the usual air tube, there are a number of columns of rubber, made of different strengths and thicknesses and placed at different intervals in proportion to the weight of the car the tire is designed for. The tire is built over a steel core or mold, and all cured in one operation, hence there is no danger of the columns separating from the outside walls, as they are integral with the outer covering. When the tire is taken off the form it is ready for use. In order to prevent sagging or depression between these reinforcing columns and to further strengthen the tire, the fabric is brought down and caused to form a continuous rib. The Dayton Airless tire is the product of the Dayton Rubber Manufacturing Company, Dayton, O., and tests made for the manufacturers by C. F. Adamson, M.E., show that the resiliency of the Dayton Airless Tire is on a par with that of the pneumatic, with the exception instead of compressed air being displaced rubber is displaced and, as in a standard 34 by 4-inch tire, there is 11-2 inches between the columns, there is plenty of room for expansion and the absorption of obstacles met with, exactly the same as occurs in the pneumatic tire. The principle is the same except that the action is mechanical instead of pneumatic. The many users who have tried the Dayton Airless tires are enthusiastic in their praise as shown by a number of testimonials printed by the makers, and it has been shown that these tires have run 20,000 miles without repair and are still in good shape. They may be retreaded in exactly the same manner as a pneumatic, making them good for another lengthy period of service, in fact, until the tread is entirely worn out.

DAYTON AIRLESS TIRE.

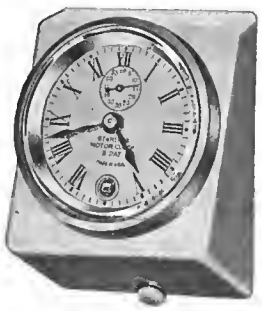
Autogas Tank Box.—It certainly seems strange that in the great improvement that has been brought about in the appearance of a car, no one has thought of providing the compressed acetylene gas tank with a cover that would be ornamental as well as affording it protection. The Avery Portable Lighting Company, Milwaukee, Wis., has just brought out something of this kind, which they term the "Autogas tank box." It is made of pressed steel finely finished in enamel, so that when applied to the running board, it not only harmonizes with the other fittings of the car, but also serves to protect the tank from corrosion, as well as holding it securely. Recesses are cut at one end of the box to accommodate the gas outlet, while at the other an opening reveals the pressure gauge. No straps or other fastenings are necessary. By opening the lid of the box the tank may be lifted out and a new one inserted.

AUTOGAS TANK BOX AND CONTENTS.

Remy High-tension Magneto, Type L.—This is a new type of magneto recently placed on the market by the Remy Electric Company, Anderson, Ind., and it has already met with a very large demand on the part of manufacturers of light and medium powered cars. It is designed with a stationary winding which greatly simplifies construction and eliminates moving contacts in the primary circuit, an objectionable feature that is responsible for a very large percentage of all the trouble caused by the ordinary type. This winding consists of a simple coil of No. 18 B. & S. magnet wire embedded in the pole pieces of the magneto, the rotor, or inductor, consisting of a simple forging mounted on a solid steel shaft. At each half turn of this rotor the direction of flow of the lines of magnetic force is alternately reversed, inducing in the coil two electrical impulses, or current waves, for each revolution. The magneto winding is direct connected through the magneto circuit breaker with the primary of the spark coil used in the magneto. The current wave lasts through fully 45 degrees of the rotor's revolution, during which time the circuit is mechanically broken. Timing is accomplished by shifting the circuit breaker round the armature shaft, to which is attached the circuit breaker cam, and owing to the nature of the current wave, which is an abrupt rise and fall, a long timing range is afforded at practically the same current value. The distributor is geared so as to deliver a spark to each cylinder of a four-cylinder motor during two complete revolutions of the crankshaft. So that the magneto is geared to run twice as fast as the camshaft. In the case of six-cylinder, four-cycle motors, the magneto is back geared in the ratio of one to three, so that it runs three times as fast as the camshaft, or one and a half times as fast as the crankshaft. With the two-cylinder, horizontal-opposed type of four-cycle motor, there is no distributor necessary, a single cam being furnished, thus causing but one electrical impulse per revolution of the inductor, and the magneto is run at the same speed as the motor. The special spark coil furnished with the magneto is fitted with a two-point switch, so that either the battery or magneto may be used, or to disconnect from either to stop the motor. It is also provided with a push button so that either a four or six-cylinder motor may be started from the seat with the lever on the battery side. The batteries are only employed for starting, the current being sent through the coil and distributor of the magneto, although the latter proves very reliable for starting, so that the real function of the battery is to act as an emergency relay, for which purpose it is primarily adopted in this outfit.

REMY HIGH-TENSION MAGNETO, TYPE L.

Sterling Motor Clock.—This is one of the scores of specialties pushed by the Post & Lester Comoany, Hartford, Conn., and is being offered as something radical in clocks selling at a moderate price. The mechanism is of the eight-day type, and is enclosed in a heavy brass offset case, the latter measuring 3 1-2 inches across, while it is 4 inches high vertically, measured across the back, or place where it is designed to be attached to the dash, while its depth at the lower part is 2 3-4 inches. The silvered dial measures 3 1-4 inches in diameter, and is protected by a heavy beveled crystal which screws over it. As the winding aperture is under the crystal, the entire mechanism is well protected against dust, mud or rain. An ingenious attaching device is provided which makes it impossible for anyone not in possession of the key to remove the clock from the dash. A good idea of its appearance may be obtained from the accompanying illustration.



A FOST & LESTER CLOCK LEADER.

The Emergency Wheel.—This is the product of the Black Manufacturing Company, 118-120 West Wayne Street, Fort Wayne, Ind., the New York sales agents being Keeny & Mason, Broadway, Fifty-seventh and Fifty-eighth streets, in the Thoroughfare Building. It consists of a substantial steel rim with two stationary clamps and two adjustable clamps, the former being placed over the regular rim, the car then being pushed forward, causing the adjustable clamps to take hold also. It is then only necessary to tighten two thumb screws, and as the latter are beveled sufficient leverage is obtained to make it easy to tighten them without the use of a wrench or other tool, and they will not jar loose. As will be apparent from the accompanying photograph showing the Emergency wheel in service, the device is very simple and substantial and saves the trouble of removing the old tire which has suffered damage, as well as the annoyance of having to inflate the new one. It is made in sizes ranging from 28 by 3 inches up to 36 by 5 inches.

EMERGENCY WHEEL AS USED ON A CAR.

Warner Tire Valve.—The Warner Instrument Company, Beloit, Wis., makers of the Warner Auto-Meter, have just placed on the market an automatic air valve which should do much to allay the autoist's inflation troubles. It is an extremely simple little device and the makers claim that with its aid it is possible to fill a four-inch tire to the proper pressure in fifteen seconds. It is automatic and positive in action, closing and opening instantaneously, and as it is free from springs and other small parts it is not liable to derangement. By simply pressing it against the valve on the tire the outlet is opened and a second valve nearer the tube is automatically closed, completely preventing the slightest leakage when not in use. The greater the pressure the tighter the valve will hold.

THE NEW WARNER TIRE VALVE.

The 3 in 1 Tire Valve Tool.—The three parts from which this device gets its name are a slotted end to remove the valve "inside," a die to run over worn or hurred threads on the outside of the valve stem, and a tap to clean out the threads on the inside. It is handled by the Auto Novelty and Supply Company, Providence, R. I.

THREE-IN-ONE TIRE VALVE TOOL.

Innerseal Puncture Repair.—This is something radically different from the usual substances that have been placed on the market hitherto for the purpose of repairing a puncture in a tire from the inside, in that it does not consist of a liquid preparation of any kind, nor is it merely a shoe or similar device. The makers guarantee it not to loosen plugs in bicycle tires, also that it does not prevent vulcanizing the repair subsequently, that it will not injure the rubber and that it will positively mend any reasonable sized puncture. It takes the form of a silver flake and is made and marketed by the Innerseal Manufacturing Company, 321 Frankfort avenue, N. W., Cleveland, O. It is covered by patents.

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THE AUTOMOBILE

THE most enjoyable season of the year for touring is close at hand, and thousands of people all over the country will start out for a week's or a month's vacation on the road. All those who toured last year will do so again—that goes without saying; and they will have gained from experience, more or less painful, much useful knowledge to smooth their way. Perhaps some of the novices may prefer to rough it the first time, and learn in the same school; but for the majority good advice will not come amiss, and will prove of value when heeded.

First of all requisites comes the automobile itself. A few years ago this might have been made the subject for many pages of wise counsel; but now almost any car of recent date and moderate size may be thoroughly depended upon. The only conditions are the size of the party and the length of the owner's pocketbook. The automobile being selected, we may consider its adaptation to the needs of its passengers; and now, whatever else you may leave behind, never, and thrice never, forget the Cape cart top. It is as necessary for touring as the seats or the floor boards. Folded down, it keeps off the dust; raised, it protects the party from a too ardent sun; with the storm curtains attached, it affords shelter from the most violent rain. Useful also, but not absolutely necessary, are the seat covers often seen; they are cooler and cleaner than the bare leather upholstery. As to glass fronts, opinions differ; it is largely a matter of personal choice. Many people think the sensation of the fresh wind blowing upon one's face is the most delightful of all automobiling. At other times the front is most serviceable.

The average beginner finds the baggage question perhaps the most puzzling of all. It is true that on ninety-nine cars out of a hundred no provision whatever is made for baggage; and on the hundredth that provision usually consists of an angle-iron contraption hung on behind, like a miniature fire-escape. It is also true that most people make the mistake of trying to carry too much, burdening themselves with so many unnecessary things.

One of the greatest joys of automobiling is the opportunity it affords of getting gloriously dirty. As a general rule, the more nearly a party resembles a gang of hoboes, the more they are enjoying themselves. When a man goes on a fishing or camping trip, he packs his old trousers, a flannel shirt, and a much battered hat; but when the same man prepares for his first auto trip, he wants all sorts of fancy dusters, caps, gauntlets and leggings. Caps blow off, and the dusters, gauntlets, and leggings are hot, hotter, and hottest. In reality, the only addition necessary to the fishing or camping equipment is a pair of goggles. Women usually prefer a small, stiff hat, firmly pinned and tied down with a stout veil, to act as a combination hair retainer.

When the would-be tourist has reduced his baggage to the smallest possible dimensions, he should study his car to find where it may be most safely and conveniently placed. Usually the space under the rear seat is left vacant and is denominated the baggage compartment; access may be had to it by lifting the seat cushion or by letting down a door behind. However, these openings are often several inches smaller each way than the "compartment," so that all the available space cannot be utilized. In this case the construction of the body should be studied. It may be found possible to remove the rear door and enlarge the opening; a specially shaped hamper may then be put in, projecting a foot or more out on the "fire-escape." A tarpaulin should

John W. Kern, Democratic Vice-Presidential Candidate, in a Haynes.

be lashed over the projecting end, and the whole firmly strapped in place. If there is ample space in the tonneau between the front and rear seats, some baggage may be carried inside. The women of the party may be more comfortable with a suit-case or two arranged as a foot-rest. All baggage carried in this way should be securely strapped down—and it is often surprising how much strapping that means. On other cars the foot room is so limited that any encumbrances become a positive torture. As a last resort, boxes may be carried on the running boards.

Maps and route-books—including the "Blue Books"—are so plentiful and—usually—so good, that no trouble will be experienced on that score. Small towns often confuse the tourist, as their streets are rarely signposted, and the directions of the natives are never very clear. Ofttimes a boy may be found who, for a dime and a seat on the running board, will be only too glad to personally conduct the party through and set them on the right road at the other side. On a cloudy day when the sun cannot be seen a compass is invaluable; knowledge of the general direction to be followed will enable one to choose the right way at an unposted fork or cross-roads. Care should be taken, however, to find whether the compass needle is deflected by the iron and steel mechanism of the car. When putting up at a hotel, or leaving the car at a garage, always ask the price beforehand; otherwise the morning may bring disenchantment.

Accessories Are Many in Number.

The mechanical equipment and accessories of the car form the broadest part of the subject, and, like the car itself, depend mainly on the length of the owner's pocketbook. Shock absorbers improve the riding qualities of almost every automobile, but are expensive for those who must count every dollar. In their absence, four good stout straps, arranged as on a buggy to limit the downward movement of the axles, will sometimes answer fairly well. The speedometer is a fitment which adds interest, though it won't help much if one falls into a police trap, and, so far from being a check on speeding, it is often a temptation. On the other hand, if a route-book is used, some kind of an odometer is almost a necessity. The horn should be looked to before starting, as there is nothing more irritating or, ofttimes, more dangerous than a hooter that refuses to hoot.

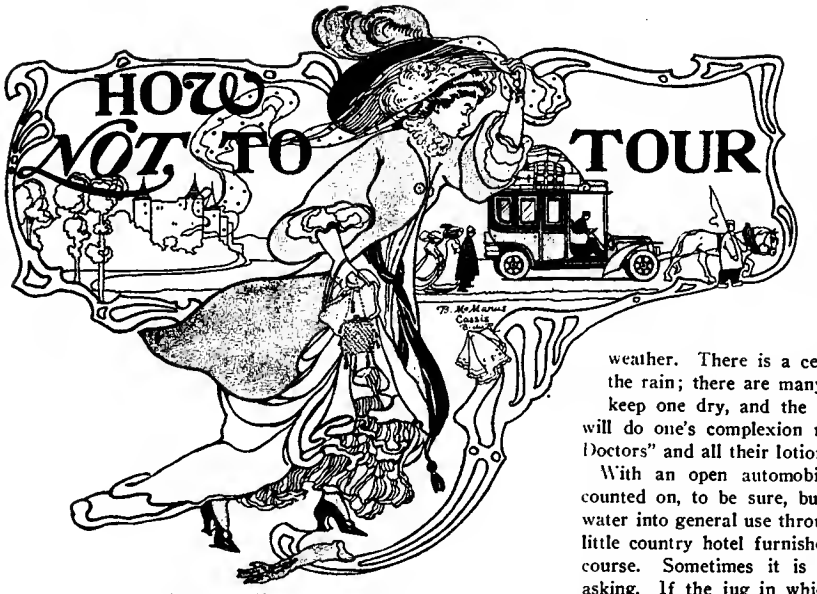
Carry a Couple of Spare Shoes.

On a tour of any length it is always advisable to carry a spare tire shoe or two if the front and rear tires are of different sizes. How to carry the shoe, however, is often a puzzling question. Many people have brackets to hold them outside the levers at the driver's seat; but that seems a very crude arrangement. The levers alone never completely block up that side, and it is very convenient for the driver to be able to get in and out there, without having to climb over the passenger on the other front seat. If the luggage carried on the rear of the car does not project too far beyond the back of the seat, the shoe may be strapped on there; or it may be fastened on the back of the front seat, inside the tonneau. It should always be fitted with a water-proof case; a round, flat leather box may be obtained to fit inside it to carry spare inner tubes and other small articles. A robust jack and a strong-lunged pump should not be forgotten; do not be satisfied with any old cheap bicycle affair.

Master Warren Alexander, a Three-Year Pilot of Rahway, N. J.

Among many other small conveniences may be mentioned a collapsible water bucket; a graduated stick to measure the gasoline in the tank (if no gauge is provided); chamois for straining gasoline; chains for the rear tires; a couple of manchons, or stout leather patches with lacings for binding over weak spots of the tires; an ammeter or voltmeter, according to whether the car has dry batteries or storage batteries for ignition; an oil gun that can be worked with one band; a sharp-pointed tool for cleaning acetylene burners, and small scissors for trimming the oil lamps. Insulating tape and wire often come in handy, and a package of chewing gum will be found a true blessing in disguise in case the gasoline piping springs a leak. Whether a man owns a 60-horsepower six-cylinder or an ancient one-lunger, let him bring it forth and spend his vacation a wanderer on the highways; no man can tell the pleasures that await him there until he has tried it for himself.

In Front of the Hotel Del Monte, Del Monte, Cal., During the Recent Run of Mitchell Car Owners.



By BLANCHE McMANUS.

AUTOMOBILE touring for women is not all fancy clothes and veils. The most luxurious limousine ever turned out, with its soft cushions and plate glass windows, will not keep one wholly free from dust. The best of chauffeurs will leave trickles of gummy oil in unexpected places, to be swept by dainty gowns, and high-heeled shoes are not ideal footwear for those unhappy days when one tramps through the dust or mud to the nearest village, while a farmer's plough horse drags a stubborn machine to shelter, and a mechanician, who more than likely is nothing but the local locksmith, does his best at tinkering.

Automobile touring, in its best phase, is a glorified vagabondage, and to be thoroughly enjoyed and appreciated must be approached in something of the spirit of the rollicking, singing vagabonds of old. The luxurious superfluities and excrescences that handicap modern travel should be lopped off and simplicity should ever be the order of one's going. The open road, the open mind, and the open automobile are the three things needful for the ideal tour.

Map reading is an accomplishment especially recommended to the woman of the automobile party, for an intelligent comprehension of the map of the region through which one is momentarily passing, and some display of feminine tact will do much to smooth the way for the man at the wheel in a strange land, and save him from endangering the lives of the whole party by trying to read as he runs; besides, this helps the women to "star" the beauty spots in her own mind, as does Baedeker in his fine-print pages. Many otherwise intelligent persons never will acquire the ability to properly scan a road map.

Couple with intelligent map study the ability to decipher road signs at top speed. It is thus that a woman can make herself a very useful adjunct to an automobile party, instead of being considered merely as an ornamental appendage, whom man wonders what he will do with when the automobile mysteriously stalls itself by the wayside, as all automobiles are occasionally likely to do sooner or later.

For real pleasurebale touring, by all means the open automobile. Why one should want to ride in a closed-in glass box reminescent of a hearse, and about as airy, is a mystery to those who really love the open road. A Continental corridor railway train is preferable, for it has at least more room in which to move about. As for a cloth or leather hood—what in England they call a "Cape hood" and in France a "Capote Americaine"—in Germany, Heaven only knows what—it, too, blots out the landscape to no inconsiderable extent, and likewise cuts off the free air and produces drafts.

But when we come to consider the matter, why should one be afraid of fresh air? It's the biggest blessing for which the automobile is responsible. Let the wind swish and swirl around you. You may not like it at first, but when once you have the hat that just suits your head, neither too small nor too large, and have taken the right reef in your veil, you will like it the more. Fresh air will do away with the *migraines* more effectually than any number of German "cures." And after you are become used to it you will not even fear bad weather. There is a certain exhilaration, even, in riding in the rain; there are many excellent rain-proof clothes now to keep one dry, and the sting of the rain drops on the face will do one's complexion more good than a score of "Beauty Doctors" and all their lotions and washes.

With an open automobile there is always the dust to be counted on, to be sure, but the automobile has introduced hot water into general use throughout Continental Europe, and every little country hotel furnishes it to automobilists as a matter of course. Sometimes it is offered voluntarily—always for the asking. If the jug in which it is brought is often very small, there is plenty more water to supplement it which will be brought by a willing *garçon* or *bonne*.

If, as has been said, the majority of automobiles are bought at the instigation of a woman, let her pass by the overpowering shut-in *carrosserie* of what is popularly called a "real touring car" (?), with its meretricious charms only suitable for the boudoir, and entirely out of place on the open road.

Of what use in an automobile is an electric arrangement for heating curling tongs, a folding tea table, or a flower holder? If she's doing *real touring*, the woman automobilist will have no time nor appreciation for this sort of thing.

Instead of concerning herself as to whether the color of the cushions suits her complexion, the woman whose husband or father is about to buy an automobile should concern herself more with the efficiency and design of the motor of 10, 20, or 30 horsepower which has caught her fancy. A motor of *marque*, suited to the work which is to be put before it, is of more importance than much gaudy upholstery, and even a superficial acquaintance with its "greasy innards" may enable the woman in the case to be of use to the driver in helping adjust a refractory nut or search out a short circuit when the usually docile man at the wheel becomes a man of wrath.

With the man of the party at the wheel, the exercise and responsibility of their own special character will be as good for him as will be early rising for you. Women can hardly hope, as yet, to compete with mere man for the honors of becoming a good driver and competent conductor of an automobile, which, after all, is something more than merely steering the thing. It is something of an undertaking keeping an automobile in running trim day after day for perhaps a number of weeks, with never the necessity of stopping for repairs. It, too, is a very different thing from "driving" oneself in that kind of a machine where you have only to "turn something," to "push something," or to "pull something," in order to have an airing in the park or a run out to the golf links.

Too Much Baggage Is a Nuisance.

As for baggage en tour: a suit case for each person is all that should be taken. Don't be beguiled into believing that you cannot do without that trunk furnished with all home comforts. The initial idea when planning a tour is to get a change from home comforts—and discomforts—to turn new pages in one's book of experience, and though often they may not be as attractive as those of chapters gone before, still the thing is to turn them all—or as many as one can.

It is hard for the average woman to realize that space on an automobile is quite as valuable for the articles of its own wardrobe as for those uncrushable components of hers. There are inner tubes and envelopes for replacement to be carried, perhaps extra supplies of gasoline and oil, and a whole kit of tools, and things which are never required until one abandons his usual base of supplies. For this reason alone the touring automobile should be as free as possible from alien trappings.

Trunks are to a great extent receptacles for carrying what one does not want, and they have no place on an automobile. We all recall the things that we have many times "packed"—"that we could not possibly do without"—which lay undisturbed in the bottom of our trunk throughout a long tour. The writer remembers once having carried a large trunk in the tonneau of an automobile—it was to head off two grafters—as well as the usual handbags for a month across France, and it was never once opened. Since then hand luggage only has been our rule.

A suit case can be made to carry all that a woman really needs for any tour short of a month; at the end of that time she will usually be quite ready to repose a while, and then it will be a simple matter to connect with her heavy luggage.

A dress of washable silk, three or four blouses, a "sweater," a soft cap, a pair of shoes, and a couple of changes of underclothing, some stocks, and as many handkerchiefs as can be stuffed into the corners, with the necessary simple toilet accessories, can be packed judiciously into the suit case of convention with room to spare.

Don't wear a pet dress. You will be sorry if you do when you discover that the oil can has been mysteriously left beneath your feet and naturally overturned itself. Either this, or you will get a *tache* of gummy grease while you were accommodatingly "handling something," that probably you should have let alone.

One needs fairly warm clothing even for a summer tour. A tolerably thick cloth suit—dark gray or brown in color—made short is quite the best thing for the purpose. Discard petticoats for bloomers of dark silk and you will double your comfort. A cap or *casquette* of heavy corded silk, with a soft stitched and sufficiently ample brim, which can be adjusted to suit the wearer's taste, the kind that French women en auto invariably wear, is by far the best headgear. Comfortable walking shoes should cover one's feet, the "pumps" meanwhile reposing in the suit case. Do away with "Merry Widow" hats, or you will find yourself in the same class with the man whose chauffeur was obliged to pull up about once in every three miles to go back and capture his employer's broad-brimmed "Stetson" which he insisted upon wearing on all occasions.

Clothing Appropriate to the Automobile.

The most appropriate and beautiful costume of one's predilection becomes commonplace and tawdry when seen out of its proper time and place, and very few varieties are suitable to automobile touring. Nothing is so becoming as a costume that is appropriate to the occasion. The man or woman automobilist of to-day is not the hideously costumed creature of a few seasons ago.

As to veils, they are a matter of individual preference. A silk hood, after all, is more protection for the hair against dust than many veils, and answers better in every way. Do without a face veil, too; wear a pair of good goggles, neither too large nor too small, and, above all, not too heavy, and preferably of a slight smoky glass. Goggles, even, can be done away with a good part of the time, when the wind is not strong and when the dust is not swirling about. This is another one of the benefits of fresh air; a good way of strengthening one's eyes.

One will get sunburned riding in an open automobile, there is no doubt about that, and wind-tanned, perhaps even freckled, and perhaps even you may "peel," but all these things are what many women pay money to acquire in other ways at some pseudo-fashionable resort, and anyway, if any or all of these things come to you, they will only be the means of convincing your friends that you have had a good time, and make them long for such on their own account.

Wear always a dust cloak that is also rain proof, with a hood attached which can be pulled over the head in case of a hard rain. If you cannot buy such a one when you come to get your outfit together, have it made. In the British Isles one needs a warm coat at any season of the year, and it will be found prudent to have one by one anywhere, for the European climate is changeable enough to make frequent protection necessary.

Have deep, mannish pockets in your coat; into one of them a folding kodak can be slipped. Wrist bags should be discarded; carry nothing in your hands; one does not want to be obliged to spend time that might otherwise be profitably employed hunting for objects on the floor boards of an automobile that ought never to have been there.

Such a wardrobe as outlined above, or some corresponding amount of wearing apparel, not more, is all that is really necessary for one's well-being and comfort en tour.

If the laundry problem becomes insistent, consult the map and pick out an interesting place at which to stay over twenty-four hours. Washing can be done anywhere for the traveler in a few hours if necessary, and if judiciously arranged for betimes.

Beware of Unnecessaries.

Don't lay in a stock of soap and tooth powder, etc., as if you were about to take a journey through wildest Africa. Most tourists, and women tourists in particular, pack their trunks and bags as if it were not possible to purchase anything en route. Good, well-stocked shops are plentiful in all towns along the touring roads, and there are few little villages that have not something which corresponds to a "general store" where, as they say in England, one can, on a pinch most pressing, add to the necessities of their paraphernalia.

Automobiling is a pretty good cure for most ills. Rushing air, unwonted exercise (and you get more of this on an automobile than is commonly supposed) and an occupied mind will often do away with the need for one's favorite remedies.

Men, as a class, are born travelers; women, as a class, have to acquire the art, and in many instances the results do not seem to have justified the exertion necessary.

If "three generations are needed to make a gentleman," three tours—and often more—are needed to make a good traveler of the average woman. This is not saying that she lacks capacity for enjoyment or delicacy of perception. It is only that she is less adaptable to change than man. The pleasurable distractions of new scenes are, for her, so often marred and distorted by the unusual, and, not infrequently, uncomfortable conditions under which they must be viewed. To be cut off from the little conveniences and comforts of their daily lives, as must often happen en tour, is a source of real or fancied hardship to most women travelers, and this is undoubtedly one of the reasons why so many of them prefer to do their touring abroad in the environs of the great capitals and in close proximity to the big shops rather than brave what seems to them the many deprivations and discontents of the open road. That forcing house of modern luxury, the big transatlantic liner, too, is a bad preparation for bridging the differences which do exist between American and European ideas of comfort. It but helps to intensify the shocks which the average feminine automobilist gets when she first starts out on her search for the picturesque along the highways and byways. The best preparation for touring is to cultivate the habit of the open mind; accommodate yourself to your surroundings rather than try and change them. Women are too prone to think that their way is only smoothed for them by the lavish expenditure of money on the part of their male relatives. Something besides money talks, fortunately, when touring in France. Little politenesses count for much among the older nations, often for quite as much as the indiscriminate throwing around of coin, though it may be difficult to convince some of this. The average person abroad who caters for travelers is not nearly so grasping, if approached in the right way, as is commonly supposed. So scatter a few smiles and appreciative words along with your louis, francs, and sous, and those who follow after will fare the better.

Popularity of Americans with European Touring

PARIS, Aug. 10.—It was while sitting at the terrace of a popular Parisian café, engaged in that essentially French triple occupation of sipping, gazing, and idly chatting, that the realization came that European touring had undergone a serious change during the past two years. Instinctively, as the result of long practice, the writer's eye was following the interminable procession of taxicabs, touring cars, heavy limousines, and dainty town vehicles that almost monopolize the Rue Royale during the afternoon. Suddenly the file of cars from French, Italian, and German factories was broken by the appearance of a Packard, a 1907 touring model, containing a party of Americans, evidently touring France. Five minutes later a Pierce had gone by, and almost on its heels was an old gentleman driving a White steamer. Before the drink was finished a Peerless touring car and a little Ford runabout in the hands of a demonstrator had skimmed along in the dense stream of traffic, making five American cars in a period of a quarter of an hour.

Even so recently as two seasons ago it would have been impossible to have seen in any part of Paris at the commencement of the touring season such a number of American cars within such a short period. As there has been practically no change in the selling situation, Ford having come into the field, and but one other maker having gone out, the obvious conclusion was that Americans are touring Europe in their own cars more extensively than proved to be the case but twenty-four months ago.

Except by getting figures from all the transportation companies it would be impossible to ascertain exactly how many American tourists annually visit Europe *en automobile*. But the interesting phase of the matter is that private owners are now extensively advertising the home construction by bringing over cars from many of the best American factories. It was the invariable rule but a short time ago that American automobilists in Europe should use cars supplied from the crack factories of France and Germany. Probably the number of multi-millionaires who buy a new foreign car immediately on arriving from the States, tour with it for several months in Europe, and either sell it or ship it over to America at the end of the trip, has not seriously diminished.

A new class, however, has been added to this floating population: Americans of rather more moderate means who, owning a good, serviceable touring car, take it with them on their trip abroad, tour with as much comfort and reliability as their countrymen mounted on the foreign article, and return home delighted with their visit and their machine. A casual visit to one of the larger Parisian garages, the "American" in the Avenue Montaigne, found seven American cars one morning not long ago. The same day Fournier's garage had three cars manufactured in the States, and at the Automobile Club of France garage two were in temporary storage. Naturally the number fluctuates considerably, for foreign automobilists are essentially birds of passage, but some idea of the number of American cars passing through Paris may be gathered from the fact that the records of the "American" garage showed a total of 60 for last season, the number being made up of 35 Packards, the rest being largely Pierce and Peerless cars. The Packard agent in Paris was last year in touch with close upon 200 different parties touring Europe in the well-known "Thirty" from Detroit, and had had communication from forty parties up to the middle of May of the present year. Beside a very large number pass through Europe without ever troubling the foreign representative of the car.

Victor Breyer, A. A. A. Representative.

An enormous impetus has been given to touring in Continental Europe by the arrangements made by English, American, and French associations to break down or, at any rate, to simplify the formalities which governments and nature have put in the way of free intercourse. Such French associations as the Touring Club of France, the Association Générale Automobile, and the Automobile Club of France are constantly striving to improve conditions, not only for their own members but with a view to attracting visitors from abroad. There is a lot of detail work, however, which even these admirable bodies cannot attend to, and the gap has been filled by the work of the English associations, and, more recently, by the American Automobile Association. As is now generally well known, every member of the A. A. A. touring in France is entitled to the services of Victor Breyer, the foreign delegate installed at 4 bis Rue Descombes, Paris. There are probably few men in France who have been more closely connected with the sport and industry on this side of the Atlantic or who are so well fitted to assist American visitors with advice on touring, the hiring of cars, the engagement of chauffeurs, or the formalities which are the necessary attendants of a visit to a foreign country.

American visitors largely profit by the excellent foreign touring branches of the various English associations. The Automobile Association, the Motor Union, the

H. D. Wilson, Packard Agent in Paris.

Royal Automobile Club, and the British branch of the Association Générale Automobile, at 166 Piccadilly, London, have all studied the European touring question so thoroughly that their members can enter continental Europe with about as little formality as an automobilist crosses from Manhattan Island to the Jersey shore. Samuel A. Miles, when touring France with a Pierce car, declared that the Automobile Association in London fitted him out so thoroughly before leaving for France that he had not even to attend to his own gasoline tank. At the present time an arrangement is under consideration by which the members of the A. A. A. can have full benefit of the Automobile Association touring bureau, not only in London but in all such ports as Havre, Cherbourg, Boulogne, Bordeaux, Marseilles, Dover, Folkstone, Newhaven, Southhampton, Plymouth, etc.

By the aid of these various associations all the formalities such as registration of car, obtaining of driving licenses, payment of custom duties, can be settled before leaving England. On arrival at the foreign port practically all that remains to be done is to attach the license pads, have the triptyque signed by the customs officer and drive away. Further, officers of the Automobile Association, the Association Générale Automobile and the Motor Union are in attendance at the French ports.

Though in the present perfected condition of the automobile a machine can undertake a foreign voyage with every hope of being independent of the factory or repairmen, occasions do arrive either by reason of accident or otherwise, when it is convenient to obtain spares without sending over the Atlantic for them. It is for this reason that the Packard Motor Car Company and the George N. Pierce Company of Buffalo have each opened a Paris depot for the convenience of their customers touring Europe. At 13 Cité de Pusy, in the Boulevard Periere, Paris, H. D. Wilson, the Packard agent, maintains practically a complete car in parts and is able to furnish any spare that may be required at a moment's notice. During the year that the office has been in operation Mr. Wilson declares that he has not sold enough parts to pay for lighting, a result which amply testifies to the reliability and good workmanship of the Packard.

The office is maintained more as a convenience to customers, for, however serious a road accident they may be involved in, there would be no necessity to wait for parts coming from the home factory. The owner of a Packard touring abroad need never fear being stranded for want of some special part unknown to Europe. A large amount of useful work is also done in planning tours, advising on methods of shipment, custom formalities, and touring regulations.

In October, 1906, the George N. Pierce Company opened its Paris touring bureau and spare parts depot at 22 Avenue de la Grande Armée, in charge of N. S. Goodsill. According to the European representative 50 Pierce Great Arrow cars were dealt with during the season of 1907. The number during the present season has been several times greater. A complete stock of parts is maintained for all models, arrangements being such that spares can be sent off at a moment's notice on receipt of telegraphic advice. Another matter of importance to Pierce owners is the recent establishment of a Paris branch by the Goodrich Tire Company, located in the Rue Brunel, a few yards from the car depot. As all Pierce cars are shod with Goodrich shoes, the arrangement is a convenient one, for these tires exactly fit the rims, and give better satisfaction than the French tires made in metric sizes only.

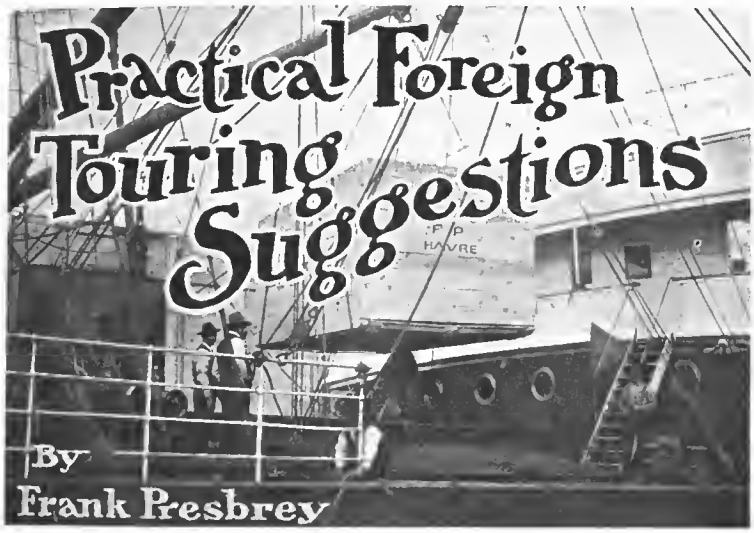
An idea of the advantage to be gained by the use of the tourist's own car can be had from figures supplied by the Pierce agent. A touring car of the size of the Pierce Great Arrow 45-horsepower would cost in France a rental of $30 to $40 per day, even when taken by the month. In addition to this the customer must pay all road expenses: fuel, garage charges, tires, maintenance of chauffeur, and an average tip of $2 per day to the latter. All fear of being stranded for lack of some minor part being removed through these foreign depots, it is no wonder that the number of Americans touring with their own cars is largely on the increase. It is expected that the total number of Pierce cars to visit France this year will be over a hundred.

A Snap Shot in a Popular Parisian Garage Early in May of the Present Year.

The first six cars are owned by foreign tourists, the makers being English Daimler, Peerless, Packard, Pierce, Thomas and Fiat. Note the New Jersey tag on Peerless and the New York license number on the Pierce.

Practical Foreign Touring Suggestions

By Frank Presbrey



Hoisting the Locomobile Aboard the French Liner, en Route for Havre.

IN taking one's own car to Europe there are few annoyances, but the satisfaction in knowing just what you can count on is more than compensation. In the first place, no apologies are necessary when you take an American car. A few years ago the French manufacturers were far ahead of us in construction, style, finish, durability of parts, and dependability. But a few years to an American manufacturer are as a generation to those of other nations. We make progress rapidly, and to-day an American automobile of the best make can be taken to Europe with every confidence that it will stand up to the work just as satisfactorily as the best foreign car.

Those who are contemplating the trip and expect to take over their own cars will find the following suggestions valuable, and the information correct, as far as it goes.

Unless the owner intends to drive the car himself it is best to take over with him his own chauffeur. He can be sent over in the second cabin on the same steamer with the car. If the owner is to do the driving, it is advisable to secure in each country a mechanic who can do the necessary dirty work on the car. But my advice is to take your own chauffeur. It is cheaper in the long run and far more satisfactory. The average foreign chauffeur is indifferent and foolhardy, and, with the French particularly, determined to "burn up" the roads, regardless of your instructions or desires. I met a friend in Tours who had employed a French chauffeur and he told me that "he (my friend) had died a dozen times during the past month" from sheer fright, and that, try as hard as he might, he could not cajole, order, or compel his chauffeur to drive at anything but a break-neck pace at every possible opportunity.

It is important to provide a description of your car, translated into French, if you are going to France or Italy, and into German if you are going into Germany, giving the maker's name, value and style of car, horsepower, number of cylinders and size, wheelbase, number of motor, factory number of car, motor power, weight in pounds and kilos, color, and equipment—that is horns, lamps, etc. This will save time and trouble in passing the customs house formalities. Incidentally it may be remarked that acetylene lamps are prohibited in cities and towns in France. Two side lights are required: the right, white, and the left, green; also rear lamps showing numbers.

Affix a small brass plate to the body of the car upon which is engraved the owner's name, his city and State, and "U. S. A."

Have extra heavy brakes put on the car, unless it is already well-equipped, and, while not necessary, it is advisable to add strong sprags to hold the car should it start to back on a hill. It is well to take with you two or three sets of Weed's chain grips.

If you take over an American car, have its maker pack for you a box containing a duplicate of every essential part, including brakes, which you are likely to have to replace, and which could not readily be made in a repair shop abroad. This box can be packed under your car in the crate and fastened to the bottom of the crate. Leave these parts at some central point from which anything you need can be sent you quickly. Arrange with the manufacturer to be credited after your return with all parts not needed.

Procure five small photographs (size 7-8 by 1 1-4 inches) of chauffeur and yourself if you expect to drive the car, for affixing to licenses in countries other than Great Britain.

Arrange with some foreign shipper—there are several in New York City and Boston—for the shipment of your car. They will take entire charge and you have nothing to do but to turn it over to them and they will have their packer make the crate for it. The charge for a heavy crate, put together with bolts so that it can be taken apart in sections and held for use in returning the car to America, is $50 for the ordinary touring body and $60 for a limousine or other closed type of automobile.

The charge for trucking the packed car to the ship is $10; charge for derrick used in loading on this side $12 (no charge for loading is made on cargo boats on crates weighing less than 4,400 pounds), and unloading and dock fees on the other side $10 to $15. To these amounts there is to be added the cost of freight and a charge of $10 made by the shippers for their services. The freight charge varies, of course, according to the port of shipment and character of ship on which the car is sent, whether express or cargo steamer.

It is advisable to make sure that the boat on which your car is to be shipped has hatchways sufficiently large so that the crate may be put into the hold and raised out of it without tilting. Be sure you have a marine insurance policy covering your car in transit. The shipper will procure this for you; and also have him turn over to you for use with the custom officials upon the return of your car the original shipping manifest from

French Signboards Are Numerous and Informing.

The information contained in this article is taken from "Motoring Abroad," written by Frank Presbrey, and published by the Outing Publishing Company, New York City.

When One Crosses from France to Great Britain.

America to Europe. This manifest should describe the car fully, factory number, date of manufacture, maker's name, etc.

If you are going to France turn over to your shippers two or three weeks in advance a typewritten copy of the description of your car, retaining a copy yourself, and five small photographs of whoever is going to drive; a "Driving Certificate" must be procured for each from the French authorities. Your shipper will arrange to secure the certificates as well as the necessary "Circulation Permit," which corresponds to our State license. The shipper's representative at Havre will have the necessary official at hand when the car is unpacked and ready to be turned over so that the examination of the driver to determine his ability may be had without delay. This examination generally consists in taking the official around a block or two, the passing of a few salutations, and the judicious extending of a tip of from five to ten francs.

The shipper will also attend to the paying of the customs, the amount being placed in his hands for the purpose at the time of shipment. The average customs deposit in France amounts to about $175 on a touring car and $200 on a limousine. The amount is figured upon weigbt and the entire sum is returned at the port from which the car is shipped out of the country, if shipment is made within one year. To secure this refund it is absolutely necessary to present the customs receipt issued by the officials at the port of entry, therefore do not lose it.

If you enter France from England, arrange all the details of customs, licenses, etc., through the Motor Union of England, reference to which is made elsewhere. This will save much trouble and annoyance and a great deal of time.

The customs duty in Italy must be paid when the car enters the country. A receipt is given and the amount returned when the car is taken out of the country. A lead seal is affixed to the car and must not be disturbed. The average duty is about $120 for a car of the touring type.

In entering England no duty is charged and the freight to England is less than to France. The three chief English ports are Liverpool, London (docks at Tilbury, eighteen miles from London), and Southampton. The preference lies with the latter two.

If you have taken over an American car be sure, before returning, to go to the United States Consul at the port from which you are to ship and make a declaration before him regarding the car. This is essential to facilitate passage through the customs house on return to the United States. This declaration should contain the material facts regarding the car, including its factory number, motor number, maker's name, etc.

If your car is of American make you must detach from it before shipment back to this country any horns, sirens, clocks, or other fixtures you may have purchased abroad, and ship them separately. The customs officials do not pay any attention to foreign tires which are on the car if they have been used to a reasonable extent, nor do they demand duty for minor necessary repairs up to 10 per cent. of the original cost of the car.

It is essential to take a passport with you. This may be procured readily from the State Department at Washington upon payment of a fee of one dollar, and in case of any legal proceedings or an accident abroad it is important to bave one.

Bear in mind while touring abroad that foreigners attach much more importance than do Americans to politeness, and when you are in Rome do as the Romans do. A pleasant smile and an agreeable manner go farther in most foreign countries than a tip. And never lose your temper.

If you are not already a member of tbe American Automobile Association, or some well establisbed automobile club, join before you go abroad. The fee for joining the American Automobile Association, whose offices are at 437 Fifth avenue, New York, is only $2. Application should be made to the secretary of the association, and this can be done in person or by mail.

It is also essential that you should join the Touring Club de France. This organization has over 100,000 members and is very powerful, being under the direct patronage of the French Government, and having a board of governors composed of many distinguished men. The wearing of the club button on your cap insures attention anywhere in France. It costs but six francs ($1.20) to become a member and many Americans are already on the club's roll. A simple application for membership made to the club at 65 Avenue de la Grand Armée, Paris, is all that is necessary, except the payment of six francs ($1.20), with an additional charge of 50 centimes (10 cents) for postage, or $1.30 in all. The club issues a year book containing a list of 3,000 selected hotels, at which all members, upon showing their card, secure a reduction of from 5 per cent. to 10 per cent. in their bill (a considerable item when one is touring). This item alone saves the cost of membership many times over. The club issues maps, and an infinite number of descriptive pamphlets, giving information as to hotels, police regulations, customs laws, etc., besides more than 300 card itineraries with sketch maps, and a dictionary in six languages of such phrases and words as would be of use to a motorist. The club will upon application make up special itineraries and facilitate a foreign tour in many ways.

If you are going to tour in Continental countries other than France, you can secure through the club a *triptyque* which will relieve you of all the details regarding duty and even the payment of it in the various countries you may visit. The application for a *triptyque* is made on a prescribel form and must be accompanied by a deposit of the amount of duty which would be imposed by each of the countries to be visited. The *triptyque* is issued under the authority of the club which becomes responsible for its members during their sojourn. If one is to tour in France only and does not expect to enter other countries on the Continent, the *triptyque* is unnecessary. Its chief convenience lies in the fact that it avoids the necessity of dealing with the customs officials at the ports of entry and departure. It is not necessary in taking a motor car to England as no duty is exacted in Great Britain.

Those who are going to tour in Italy should join the Touring Club of Italy. Its headquarters are at 14 Via Monte Napolene, Milan. Membership costs 10 lire ($1.94) and is very helpful. The club offers most of the facilities afforded by the Touring Club de France.

If you are going to tour Great Britain join the Motor Union of Great Britain and Ireland, which corresponds to the Touring Club of France. Membership, which costs one pound one shilling ($5.25), can be procured in advance of reaching England by application to the secretary, No. 1 Albemarle street, Piccadilly, London, W., with a remittance covering the fee named above. This organization is very helpful and membership therein desirable in that it will secure discounts from the customary prices charged at many hotels. It also assists members in any legal complications, in shipping cars to France or other European countries, in securing insurance. et cetera.

INFLUENCE OF HEAT TREATMENT ON STEEL*

By THOS. J. FAY, President Society of Automobile Engineers

STEEL, no matter what its chemical composition or mode of fabrication, is rendered soft or hard, and otherwise altered in its texture, if it is "heat treated." It is of course understood that the extent of the changes that can be brought about by heat treatment will depend upon the composition and the other characteristics of the steel. It is also true that skill and the facilities used for treating the steel will greatly influence the results. It is proposed, in this chapter, to go into this matter at some length, and the endeavor will be to show the various ways in which the several grades of steel used in automobile work may be rendered best fitted for the work. An attempt will be made to set down all requisite data for the benefit of those who have every facility without neglecting engineers who may not care to pay the cost of all the necessary equipment.

Fortunately, automobile engineers are of that class whose knowledge and experience place them in advanced positions, so that it is unnecessary here to begin with an elementary course. Much of the information might even be abandoned were it not for the fact it is desired to cater to some extent to "artificers" as well as to engineers, and it may be many of them are not in possession of many of the fairly well understood facts in relation to the question of the heat treatment of steel. Even engineers who have not made a specialty of the manipulation of "alloy steel" will find in these pages some cautions and data that may well serve for them, notwithstanding their considerable knowledge of the subject. The reason for this is that "alloy steel" intensifies the expected action, and those perfectly familiar with carbon steel phenomena might be at a loss with other products.

Product Should Be Properly Classified First.

To more clearly understand the situation, it will be proper to point out in what way heat treatment alters the structure of steel, for then it will be possible to understand the advantages to be derived from such a proceeding. If steel is in the normal state as it comes from the maker, it may be desirable to reduce it to some condition foreign to the normal, for some purpose dictated by the service to be rendered. Normally constituted steel is a product, the condition of which seems not to be well understood by many, and it will therefore be desirable to endeavor to qualify on this point. Steel is not always in the normal state as it is received from the makers, so that it is not possible to describe normal steel as the product as it is received. Even though the makers are not in the wrong in any way, it is possible the steel may be in an abnormal state, even if it is ordered as normal. The point to be made here, then, is to fix a distinction as between steel in the normal state, as compared with the product in some one of the abnormal conditions.

Steel may be reduced to the conditions as follows:

(*I*) Normal (Pearlitic)
(*a*) Lamellar.
(*b*) Granular.
(*II*) Normal (The preponderance of Ferrite)
(*a*) Lamellar.
(*b*) Granular.
(*III*) Normal (The preponderance of Cementite)
(*a*) Lamellar (Pearlitic).
(*b*) Granular.
(*IV*) Martensitic.
(*V*) Sorbitic.
(*VI*) Trootsitic.
(*VII*) Austenitic.
(*VIII*) Burnt.
(*IX*) Composite. (Soft core and hard shell.)—Cemented,
(*X*) Conglomerated.

*Extract from Chapter XXI, "Materials for Automobile Construction," By Thos. J. Fay, E. E., to be published by the Class Journal Publishing Company.

This is not to say that all steel can be classified under one or the other of the heads above given; on the contrary, it would be extremely difficult to accomplish such a task in many instances. For this reason it is important to know the history and the chemical composition of a product, before any attempt is made to heat treat it. The condition (*IX*), for illustration, cannot be established if the steel is of high carbon, alloyed or not. The reason for this lies in the fact that if the carbon is high the core will not be rendered soft. The shell will be hard, to be sure, but the core will be hard also and the steel will be rendered non-dynamic as a result. Such a product would be so brittle as to serve no useful purpose at all.

Likewise, the "burnt" structure is due to the fabrication, and the user of the steel cannot correct this structure by any available means. Steel, then, in the state (*VIII*) is not good to use nor can any mode of heat treatment correct this. Many illustrations of the fact that history is important could be given.

Pearlitic steel might be classed broadly as steel holding pearlite; on the other hand it is the purpose here to fix for normal pearlitic steel that product holding approximately .009 per cent. carbon as pearlite. If the steel of this carbon content is not as pearlite, it is not in the normal state. It could still be pearlitic, but it would not be normal pearlitic steel. The classification (*I*) then contemplates the steel of the carbon content stated, holding 100 per cent. pearlite, or very nearly so.

Carbon Content Determines Normal Condition.

If the steel holds less than .009 per cent. carbon, it will be normal, if the condition is that of pearlite and ferrite in the proportions consistent with the total of the carbon present. That is to say (assuming a case in point), if the carbon is .002 per cent., the proportions for normal steel would be as follows:

as 90 : 20 :: 100 : 22.2 pearlite
and,
100 — 22.2 = 77.8 ferrite.

Or, in general, it would be possible to say (for steel holding less than .009 per cent. carbon) the proportions of pearlite to ferrite for normal steel would be:

as 90; points of carbon :: 100 : % pearlite, hence
100 — pearlite = ferrite percentage.

In other words, in normal steel of the class holding less than 90 points of carbon, there should be no condition besides ferrite and pearlite. There is one other point to be observed in this connection before the matter can be settled, viz: the pearlite can be in either one of two conditions as follows: (*a*) lamellar, (*b*) granular. The lamellar pearlite is produced if the steel is cooled very slowly from a very high temperature (annealing process). It would seem, therefore, as if this is not the pearlitic stage likely to obtain in normally constituted steel.

The granular pearlite, on the other hand, is shown as an intimate mixture of ferrite and cementite, the product resulting from a reheating to a low temperature and cooling in the air. This granular pearlite (irregular granular structure) is more likely to be the normal product of the mill than the steel of the lamellar pearlitic condition. It follows, therefore, that it will be proper to regard the condition (*I*) as of the (*a*) or (*b*) stages.

Obviously, not to know the history of the steel is to take great chances in its heat treatment, if the effect of heat treatment is varied with the previous condition. The amount of the actual variation, as a result of the previous condition, really depends upon the composition of the steel, it being the case that products very low in carbon are not so readily effected as those in which the reverse holds true. This latter statement will hold for all genera of steel, alloyed or not.

The pearlite condition can be varied in the products (*II*) and (*III*) as well as in the product (*I*), hence it will be well to

make an (*a*) and (*b*) distinction in these cases also. Beyond these stages, however, the situation becomes too complicated to attempt to maintain a separate classification of the pearlitic stages, since it requires no stretch of the imagination to indicate that there are innumerable stages intervening.

If the carbon is in excess of .009 per cent., normal steel will consist of pearlite and cementite excess, just as in the case of the steel with less than this amount, the excess is ferrite. Considering the higher carbon steel then, it will only be normal if the ferrite excess does not exist and cementite is the sole excess. Certainly it would be far from good practice to treat steel holding a cementite excess in the same fashion as if the excess were ferrite. With the carbon content in excess of .009 per cent., there is the same question of the pearlite condition, and a distinction must be made as between annealed and normal steel. This will be a difficult thing to do in general practice, and it becomes necessary as a rule to depend upon the vendor of the steel, to a very great extent.

If steel is alloyed, the effect of the alloying elements must be taken into account in the heat treatment, and in numerous mixtures the carbon conditions will be found awry. What has been said about the carbon condition holds if there are no alloying elements present, and also to a great extent with some of the alloying elements present, while others serve to alter the carbon condition to an enormous extent, since some of the alloying elements form carbides, as vanadium. Certainly, if carbides are formed, it is not to be expected that the more simple conditions hereinbefore described will still hold true. But this is not the time nor the place to discuss these matters in detail, more than to point out that it will be a fallacy to expect the same results from the same treatment for all grades of steel or for any one grade of steel irrespective of its condition before treatment.

However good the facilities for treatment may be, to proceed without knowing the history of the steel as well as the composition thereof, is to chance spoiling it and to end by having present in the automobile a part of no safety at all. It is plain from what has been said that besides the normal and annealed products there are the other conditions to be taken into account. The martensitic (*IV*) condition is brought about if the steel holds carbon between .002 per cent. and .009 per cent., provided the steel is suddenly quenched from a high temperature. This martensite formation is more completely developed if thin specimens are raised to a point above Ar_1 and suddenly quenched in a suitable cold bath. The question of the appropriate bath for quenching is a matter to be discussed at length at a later time. At all events, it must not be expected that a very complete martensite structure will result from the ordinarily more or less indifferent practice, or if the specimens are of great bulk. If the mass is great, it is not possible to so suddenly bring about the requisite temperature to evolve the martensitic formation only.

Some Conditions Are Only Transitory Stages.

The sorbitic (*V*) condition is a transition between cementite and ferrite, in unhardened steel, or if the steel is hardened, sorbite is the transition between cementite and martensite. A very simple way to bring about this stage is to temper steel in the martensitic stage. It is this sorbitic stage to which many of the important parts of automobiles are reduced to render them fit. The martensite would not be sufficiently dynamic (kinetic) to afford the requisite safety, and in tempering the quenched parts the object is to bring about the sorbitic condition. Of troötsite (*VI*) it may be mentioned that its formation holds between martensite and ferrite, and is a mere transition to be regarded as the product obtainable if the carbon content is approximately .009 per cent. This formation will follow the mild quenching of martensitic formations, or it may be produced in other ways, as when steel of the requisite carbon content is suddenly cooled from the point of "recalescence" It is also likely to obtain if small pieces are oil-quenched, from a temperature above the "critical" range.

Austentite (*VII*) is the product of suddenly cooled steel if the carbon content is quite high—.015 per cent., although more or less of the austenite formation will result even if the carbon content varies over a considerable range. The quenching temperature should be about 1,050 degrees C. for the austenite production, this being higher than the usual quenching temperature. The austenite formation is not easy to distinguish nor is the carbon condition well enough defined to enable metallurgists to say much about it. The austenite is softer than the martensite surrounding it, and if ammonia nitrate is used as an etcher, the austenite does not color as does the martensite.

Burnt Steel Is Not Wanted for Any Purpose.

The "burnt structure" is the least desirable of all; indeed, it is not wanted at all. (*VIII*). This is the structure in which the grain formation is broken up, the separating media consisting of oxides. There is no heat treatment that the author knows of that will reduce the oxides, hence this formation is quite worthless, since burnt steel has no value in structural work of any responsibility. Nor does any authority attempt to say in what way burnt steel can be rendered free from the damaging oxides that render the steel brittle and unreliable.

The author does not understand that steel will be burnt in the act of heat treating, since the burnt structure is that peculiar to the process of fabrication under certain conditions, described elsewhere. There is a crystalline structure that is arrived at in heat treating that is frequently said to be a burnt structure, but it can be corrected in most cases where a suitable process is skillfully employed.

The composite (*IX*) formation, as here set down, is nothing more nor less than the "cementing" (case-hardening) process by means of which low carbon steel, alloyed or not, is rendered hard on the exterior while the core is rendered soft but tough. This process is peculiar to low carbon steel, and cannot hold if the carbon is in excess. As a matter of fact, the carbon should not exceed .002 per cent. as a maximum, while it would be better below .0016 per cent. in strictly carbon steel, and even lower in alloy steel. Class (*X*) is not a well-defined class of the product of heat treatment. It is, in fact, what results from imperfectly conducting a defined heat-treating process. As a rule, this is what is not wanted in quest of a well-defined condition. When treated steel does not answer to any of the defined conditions, the author then prefers to classify the product as a "conglomerate."

It is possible, then, to consider some ten different conditions of steel, as a result of manipulation for the most part, it being the case that one of these conditions is the result of insufficient care in fabrication, i.e., the burnt structure (*VIII*). It is to definitely establish some one of these conditions that heat treatment is given to steel. If steel is in the normal state upon its receipt from the mill, some one of the other conditions can be fixed, assuming the steel is of a grade suitable for the purpose. It is not claimed that any grade of steel can be reduced to any one of the states before named, and it requires quite as much skill in the selection of the steel as it does in its manipulation. If steel is "nature hard," for instance, to render it soft will be an obvious impossibility. If, on the other hand, the steel is naturally soft, it may resist hardening by every known process unless the product is first "cemented" in order to increase the carbon content sufficiently to bring about the desired result.

Even then, it must be remembered that steel cannot be carbonized to a great depth, hence, the "core" will remain soft, although it may be toughened in the process. Likewise, it will not be possible to fix the sorbitic stage, unless the steel is so constituted as to render the process possible. The composition of the steel, the quenching temperature, and the sizes of the parts are all factors to be taken into account, not to mention the previous history and the skill of the artificer in influencing the result for good or evil, as the case may be.

Each alteration of the carbon condition will have its resultant change in the strength and performance of the steel. It fol-

lows, therefore, that any carelessness in ascertaining the exact composition of the steel, or any lack of deftness in the manipulation thereof, must react on the results to the detriment of the product. When alloying elements are present, the chances of failure are much enhanced, and it is only by repeated trials that the best results may be realized, provided the repetitions are under control and well-defined. What chance is there then of attaining exact results, if the process is conducted in a place not provided with any of the requisites or if the artificer is without exact knowledge of the attending phenomena?

With every facility, with the best possible steel for the purpose and with an artificer of pronounced skill, it is still possible to evolve but indifferent results in some cases. It is, on the whole, a considerable task to heat-treat some of the alloy steel products, and be reasonably sure of attaining the ends sought for. It is even a question if the more simple problems in heat treatment can be solved day after day, and not have a percentage of misses. The micro-structure is not the only thing to take into account, there is the question of the static and the dynamic ability; the utility as a bearing surface and the physical properties in view of the service to be rendered. A crystalline structure would, of course, be undesirable, and it might be said this sort of a structure would show in the microphotograph. At all events it is necessary to avoid a condition of crystallinity, and it is desirable to afford a silky fracture, as well as great density.

The test proof should be "cupped" if the steel is of great strength, and to attain this condition the heat treatment must be consistent with the requirements. Some grades of steel will not "cup" at all, and they are to be avoided, if the service to be rendered is that requiring a grade of steel that will be D.S.C.* at the fracture as the result of a pull test. Some grades of steel will show these phenomena under all conditions to which the steel can be reduced. The question of dynamic (kinetic) ability is one that should receive much attention in automobile work, and it is one of the purposes in heat treatment to establish this condition to the maximum possible extent. Steel can be rendered hard and at the same time it can have imparted to it increased kinetic qualities. On the other hand, the same steel can be rendered hard and have its kinetic ability almost completely destroyed.

Hardness Is Not the Only Quality Desired.

Tool steel, holding upwards of 25 per cent. Tungsten (other components to suit) will be rendered extremely hard if it is raised to about 1,400 degrees C. and cooled in an "air blast." But this does not mean the same steel will have dynamic value. Steel so manipulated will be good for its own purpose, *i.e.* as tool steel for cutting purposes. Certain grades of chrome nickel steel will be rendered hard if they are slowly raised to a temperature one-half that stated for tool steel, and allowed to cool in still air. These grades of steel will possess great kinetic abilities, serving perfectly for dynamic duties, but the steel so treated will not serve as a tool steel at all. Here is a case of a difference in temperature with slow cooling in air instead of forced cooling in the same media, and a difference in kinetic ability. Both products will be almost equally hard, but only one of them will hold a cutting edge.

A close observer would say then, that if steel will hold a cutting edge it may not be so good as a product for dynamic work. It would serve as a means of finding out if a product is dynamic, to a certain extent, at any rate. Indeed there are many ways of ascertaining the utility of a product besides the conventional tests, and such rule of thumb methods are employed as the preliminaries to a more complete test, if, after the quick, ready at hand trials, the steel is found of enough value to make further tests worth while.

Of course the micro-structure is a close index of all such matters, but it is unfortunate that there are but few practitioners who resort to the microscope, in every day work, if at all. To show that a difference in heat treatment will make a micro-structural difference in the steel, it is only necessary to consult the micro-photographs given in this work. In general, it will be possible to point out approximately the results of different modes of heat treatment which would hold even though the micro-structure be not examined. Take for illustration .009 per cent. carbon steel, this product would have, as before stated, 100 per cent. pearlite in the normal state. This same product would hold 100 per cent. martensite, as a result of quenching above Ar_1. Certainly the difference as between 100 per cent. pearlite and the same percentage of martensite is almost as the two extremes. It might be well to point out, however, that the steel so constituted would not be soft, even with 100 per cent. pearlite, and would be "glass hard" with 100 per cent. martensite.

Let us take another case with lower carbon; say .002 per cent. In this case, the normal steel would hold 22.2 per cent. pearlite, and the same steel, if quenched from a temperature above Ar_3, would develop a martensite formation of 100 per cent. On the other hand, if the same steel were to be quenched from a temperature between Ar_1 and Ar_3 the martensite of the quenched product would be equal to the pearlite of the normal steel. There is one other point to be explained before this matter can well be dropped. It was shown that the martensite would be 100 per cent. under certain conditions for both .002 per cent. carbon steel, and for the steel holding .009 per cent. carbon. Will the two separate grades of steel (very different in carbon) have the same strength in the martensite state? If the "tensility" alone be considered as sufficient to reflect the point to be made, the matter can be stated as follows:

Water quenching at 750 degrees C. has no appreciable effect on the tensile strength of steel between the limits of .002 and .009 per cent. carbon. The result is the several products will take on the hardness due to their carbon contents. It is not, therefore, probable that the 100 per cent. martensite in the widely differing products would be followed by a hardness the same for all. It seems almost unnecessary to raise this question at all, unless to more clearly point out the difference as between the hardness of martensite *per se* and steel hardness in general.

It is not to be inferred from this that the tensile strength of all the products with their respective carbon contents will remain stationary if quenched at 750 degrees C., but the alterations noted are not great, and it has been shown that to increase tensility, the water quenching must take place at a higher temperature, say 900 degrees C., at which temperature the products above .005 per cent carbon would be valueless unless a subsequent annealing process be conducted.

Equipment Should Be Sufficient for Requirements.

If it is true that the products to be heat treated must be manipulated with exactness, it is then true that the equipment must afford the means for doing so. Certainly a forge, a bucket of water and a pair of tongs will not suffice for the purpose. On the other hand, exact knowledge and a crude equipment is to be preferred to all the laboratory refinements in Christendom in the hands of a manipulator of no skill.

The prime considerations might be catalogued as follows:

(a) Steel of the desired qualities for the respective tasks to be accomplished. (b) Equipment of the hardening process consistent with the requirements. (c) Knowledge of the steel and the process of heat treatment. (d) Skill in the process.

This may be just as good a time as any to set down the general requirements of the steel to be treated, in view of results to be attained, for if knowledge of the steel and the equipment be at hand, the accomplishment of the rest of the task will be but a matter of execution. On the other hand, it is plain that the hardening room question is truly a separate matter from the abstract steel question; hence it will not be proper to discuss steel at any length at this time. The discussion here then will be limited to a few hints such as will aid the manipulator in the selection of the treatment to use under the several likely contingencies that are most apt to arise in the preparation of materials for certain specific purposes on the automobile.

*D = dense; S = silky and C = cupped, at the fracture of a test specimen or proof, International standard dimensions preferred.)

SHOP KINKS OF INTEREST TO THE AUTOIST

IN a former issue were given sketches showing how to anchor a Cape cart hood iron in case the original fastenings proved insecure. The method shown could be carried out without a blacksmith's aid and with only ordinary tools. If, however, the job can be sent to a blacksmith or to a carriage shop, a much more substantial repair can be made, as shown in the accompanying illustrations, picturing two or three modifications.

In Fig. 1, *A* is the iron, and *B* shows the original form of the lower end. The fault of this design is that there is no sufficient hold against the purchase of the overhanging upper end, in case the overhang amounts to several inches, as it sometimes does. In addition, the screw *C*, which does not go clear through the side of the seat, is too small to serve as a fulcrum. To correct this defect, the first thing to be done is to put a carriage bolt, *D*, right through the side of the seat, having its head outside, as Fig. 2 shows. To oppose the purchase of the upper end, the lower end must be cut off and a piece welded on it and shaped to act as a lever. It would be possible to

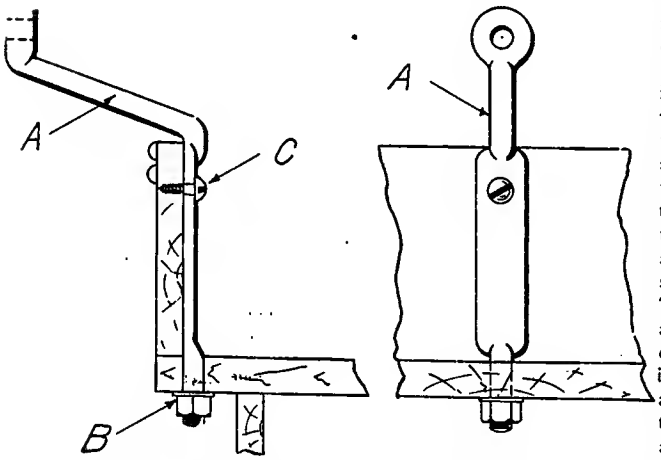


Fig. 1—Former method of anchoring cape cart top irons on body.

have this piece extend horizontally inward over the wood seat. This, however, might possibly interfere with taking out the gasoline tank, and in that case the extension *E* can be shaped as a flat inverted *T*. The ends of this *T* are drilled for bolts to pass down through the overhanging part of the wood seat. The *T* so formed does not need to be more than 1-8 or 3-16-inch thick, and if the edges are beveled off it will not chafe the bottom of the cushion. In a particular case the charge made by a wagon shop for this repair was $3.50 for two front irons.

Grounding Make-and-Break Contacts.

In a make-and-break igniter the grounded electrode is the rocking stem and finger. This stem is lubricated by what oil may chance to pass it from the combustion chamber. Usually this oil is sufficient for lubrication, and it may be so abundant as to interfere with the flow of current. It is not uncommon to see sparks jumping from this electrode to adjacent parts when the motor is running fast. In case misfiring is noted, and the insulation of the lava bushings is known to be good, a light coil spring may be connected between the rocking stem and any adjacent grounded part, such as one of the studs holding the igniter plate. This spring should not be stiff enough to interfere with the make-and-break movement. Soft copper wire is the best material for it, and one end of the wire may be soldered to a copper "battery terminal" held by the stud nut, this making a permanent and reliable method of fastening electrical connections.

Ordinary grease when used to stop spring squeaks has the objection that it quickly works out, leaving the squeak as bad as ever, and making it necessary to repeat the operation quite frequently. If graphite be mixed with the grease until the mixture is quite stiff it will last a good deal longer than grease alone. Best of all, however, is linseed oil and graphite, since this does not tend to cut the band like mineral or animal grease. The graphite should be added to the consistency of a stiff paste, and the oil then serves simply as a binder.

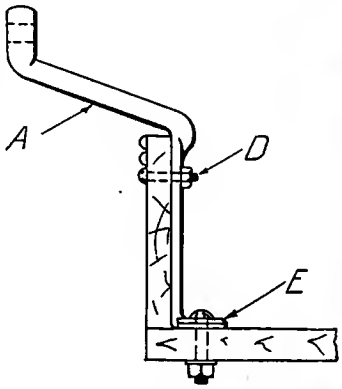


Fig. 2—Improved method of fastening.

A Clutch Renewal.

The leather of the ordinary cone clutch by degrees acquires a sort of coarse surface glaze, which may or may not represent actual charring of the leather, but is certainly due to the slipping it experiences. A leather with its surface so glazed has a very harsh action, since the surface is so hard that it grips all at once. The glazed surface will not absorb oil to any appreciable extent, a fact which is easily seen on attempting to dent the surface with a thumb nail after giving the oil time to soak in. In this condition the best thing to do is to put on a new leather. Unless the angle of the cone is too abrupt, a piece of ordinary belting will serve the purpose, provided it is of uniform thickness throughout. The belting may be soaked in neatsfoot oil over night before applying, and this will render it pliable enough to take the shape of the cone. If the old leather is retained in service it becomes almost essential to squirt a little oil on it every day or two, as otherwise it may take hold with such a jerk as to endanger the transmission shafts. If the cone releases by drawing backward, there are probably openings in the web of the cone through which the spout of a squirt can may enter. Oil squirted into the flywheel interior will then quickly find its way to the clutch surface. Sooner or later, however, the leather will become glazed so smooth that it will not hold at all, and it is then liable to slip and burn up without warning. There are few things more exasperating than a clutch which cannot be made to hold properly, particularly when the car happens to be covering a bad stretch on which every available bit of power that can be transmitted to the rear wheels is necessary. The use of emergency remedies under such circumstances most often leads to the necessity for clutch repairs, as road dirt and grit are not the best things possible for the leather facing, and frequently no other friction producing compound is to be had at the time.

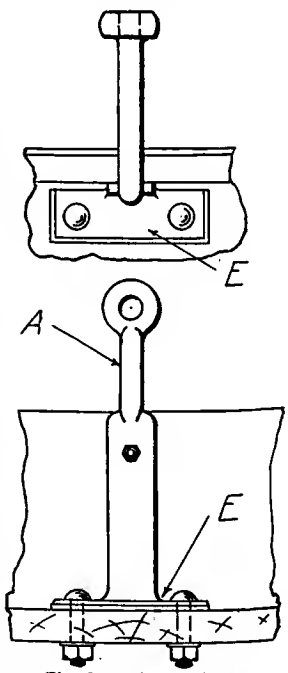


Fig. 3—"T" style irons.

ABOUT SOME CHARACTERISTICS OF MAGNALIUM

By M. R. MACHOL.

MAGNALIUM is an aluminum alloy which promises to fulfill the expectations based in the past on aluminum but never wholly realized. Like pure aluminum, it can be cast in a liquid condition. The castings can be machined about the same as brass. The machined surfaces are of a mirrorlike smoothness and silvery color, and perfect screw threads can easily be cut in the metal. Bored holes are always very sharp and clean, while filing results in fine, regular, cleancut surfaces without tearing up the metal or clogging up the file, and it will allow even the use of the finest files in its working.

Magnalium can be cast by any foundryman, the only precaution necessary being the use of clean graphite crucibles, and care must be taken not to increase the temperature too far above the melting point, as this weakens the metal. If cast in an iron chill, the tensile strength is greatly increased and is at a maximum if the chill is water-cold. Cast in dry sand, the usual quality of magnalium has a tensile strength of 18,000 pounds per square inch, and shows reduction of area of 3.75 per cent. Cast in iron chills, 22,000 to 25,000 pounds per square inch may be realized, the reduction of area being 5 to 8 per cent. The tensile strength of a quality containing a somewhat smaller percentage of aluminum equals about 34,000 pounds per square inch, but can be increased to about 42,500 pounds per square inch by proper treatment. By drawing, rolling, pressing, etc., the tensile strength obtained by quick cooling is still further increased. Wire drawn from one quality of alloy has a tensile strength of 41,000 pounds and 10 per cent. reduction of area, while it will stand 53,000 pounds if the raw material has been forged before drawing.

High Tensile Strength May Be Realized.

Soft rolled sheets of alloy "Z" have a tensile strength of 42,000 pounds and 15 per cent. reduction of area; hard rolled sheets about 52,000 pounds and 3 per cent. reduction of area. Magnalium containing less than a certain percentage of aluminum cannot be rolled but can readily be drawn. The tensile strength of a drawn bar was 60,000 pounds, and that of a tube 74,000 pounds per square inch. Another advantage of magnalium is that it is extremely close-grained, so that the polishing can be done without previous treatment by any special instruments. Furthermore, in lathe work, the tool speed can be twice as high, thus making a great labor saving. Pure aluminum, being soft, can be cut with a knife like zinc or lead, while magnalium is hard. Some magnalium alloys, however, are very ductile and can be forged, rolled, drawn, etc., sharing all the advantages of aluminum in this direction.

Annealed magnalium "Z" is so ductile that it can be rolled or beaten like silver. The elasticity of cast or annealed magnalium is small, but in the forged, hard-rolled or drawn material it is much greater. It attains and maintains a high polish and shows excellent resistance to atmospheric conditions. Its color is silvery white and it has the further advantage that its specific gravity is less than that of aluminum. While the specific gravity of pure aluminum is 2.64, magnalium shows 2.4 to 2.57, according to the percentage of alloy. The metals named below are the following number of times as heavy as magnalium:

Zinc	2.87	Brass	3.61
Tin	2.92	Silver	4.20
Cast Iron	2.88	Lead	4.56
Nickel	3.30	Gold	7.70
Copper	3.58		

The melting point is 640 to 676 degrees C., or 1,185 to 1,250 degrees F.

Magnalium does not have any odor and resists oxidation better than any other light metal, being almost unaffected by dry or damp air, water, gaseous ammonia, carbonic acid, sulphurate of hydrogen and most organic acids. It is only very slowly affected by saltpeter or sulphuric acid, and more rapidly by alkalies or strong alkaline solutions. Salt water attacks magnalium slightly, but where exposed to sea water the metal should be lacquered, which will protect it so that it will give excellent satisfaction. It shows almost no magnetic influences but its electric and thermal conductivity is about 58 per cent. of that of pure copper. The electric conductivity of the most important metals, taking that of copper as 100, is as follows:

Silver	100.00	Swedish Iron Wire	16.00
Copper	100.00	Tin	15.45
Gold	73.00	Platinum	10.60
Aluminum	63.20	Lead	8.88
Magnalium	66.10	Nickel	7.79
Zinc	29.90	Antimony	3.88

The specific heat of magnalium is 0.2185.

Treatment in Melting and Casting.

Magnalium is best melted in ordinary graphite crucibles, care being taken that the crucibles are perfectly clean. The metal must not be heated further beyond its melting point than necessary (about 1,200 degrees F.). The crucibles should be evenly surrounded with coke and should rest on a fireproof support, this being necessary to keep the crucible from direct contact with the grate and to prevent cooling the metal by an air draft after the coke burns up. The lid remains on the crucible to prevent contact between the air and furnace gases and the metal. The temperature should be as even as possible and the crucible should reach a red, but never a white, heat. When the metal is melted, the crucible should be removed from the furnace and placed on a warm iron sheet or other fireproof support to prevent the metal chilling from the bottom before pouring. The molten metal should be well stirred and the slag skimmed off, and then cast into an iron mould in such a way that the slag and oxidized skin can be kept back by a skimmer. No flux is necessary. In spite of its low melting point it should take 43 to 45 minutes to melt it.

In making sand moulds the sand is loosely pressed and should have as many airholes as possible. The casting channel should be cylindrical, the entrance should be wide and the casting funnels and the risers must be wide at the base and narrow at the top. The casting head should also be rather large. Where moulds are prepared in this way the air and gases can easily escape. The oxidized skin and slag will rise and the finished casting is absolutely free of pores or blowholes. For casting in an iron mould the metal must be hotter and the moulds should be well heated. When melting scraps, chips, turnings, etc., the larger pieces should be melted first, then the crucible should be removed and the borings, turnings, etc., be added, as otherwise the loss due to burning is too large. When melting large pieces this loss is not more than from one-half to one per cent. The loss in melting borings and file dust is as much as 10 to 15 per cent. In damp sand, the metal should be cast quickly and at as low a temperature as possible. In dry sand or chills, the metal should be bright red and should be cast slowly. Ingots must be cast in closed moulds with planed inner surfaces. The moulds should be well cleaned before using, brushed with graphite and well heated. Castings in sand should be cooled slowly, but chilled castings, especially ingots, should be cooled quickly, preferably in cold, flowing water. This makes the metal tough and ductile.

How the Metal Is Forged and Rolled.

Magnalium, especially alloys "X" and "Y," can be forged with good results most easily by heating the metal and then working about the same as Swedish steel. The metal must not glow red but must be hot enough to char a piece of wood. Of course, the casting has to be clean before forging to avoid cracks. The great ductility of magnalium, especially alloy "Z," makes it possible to produce plates of any thickness. The ingot is first heated to between 570 and 600 degrees F., and rolled so that the reduction at the first pass is about 20 per cent. Then the plate is

again heated. After the first two passes the plate is turned 90 degrees and passed through the finishing rolls until it reaches the required thickness for the particular purpose in view.

As magnalium rapidly loses its ductility in rolling it has to be annealed repeatedly. The rolls must be thoroughly cleaned and sprinkled with paraffin for every pass. If possible, it is advisable to work the ingot with a hammer before rolling. All roughness of the surface of the ingot should be scraped, as is done with copper or brass. A large amount of power is necessary for rolling, about as much as for heated steel. The operation is facilitated if the rolls are heated to a temperature of from 210 to 300 degrees F. Ingots thicker than .15-inch must be annealed after each pass. Below this thickness, plates can be finished by cold rolling. All other manipulations in rolling are about the same as with other metals.

Method and Results of Annealing.

Magnalium should be annealed in a muffled furnace in order to keep the flame and gases away from the metal, and the annealing furnace must be kept at an even heat. The metal must appear dark red and char a pine wood stick so that carbon particles separate from it. To anneal plates does not require as high a temperature. If plates are chilled in cold water, they will be very tough and ductile. The thinner the plates the lower should be the temperature of the annealing furnace. Plates of less than .01-inch thickness can be heated in boiling oil or water, and allowed to slowly cool. If magnalium is gradually heated to a temperature of less than 750 degrees F., and slowly cooled, the metal can be worked into springs.

It is a very ductile metal and in this respect is only surpassed by gold, silver, platinum and copper. The diameter of the cast ingot should be reduced very slowly at first, best results being obtained if the ingot is forged before drawing. Perfectly smooth wire as fine as silk threads has been made with astonishing tensile strength. Tubes made from plates or from cast hollow pieces are treated in exactly the same way as rods, namely, annealed repeatedly, chilled and drawn cold over a mandrel.

Where machinery is concerned, magnalium is remarkable, inasmuch as it can be tooled at high speed, about like steel. Screwthreads of considerable length can be easily and cleanly cut. The tools have to be very sharp, and the surfaces (both metal and tools) must be kept lubricated with either kerosene, turpentine, paraffin, benzine, vaseline, soapwater or even clear cold water. Excellent surfaces will result and perfect screwthreads or holes will be obtained. To cut magnalium, a fine-toothed saw, lubricated with kerosene, is recommended. Magnalium can be punched, drop-forged and pressed without any difficulty about the same as silver, brass or steel plate, if well annealed.

This new aluminum alloy is a German product and it has met with considerable success abroad in such applications as bicycle, automobile and aeronautical work. It is manufactured by a large German concern, for which the writer is the American representative at 32 Park place, New York City.

PERMITS NEEDED IN MT. RAINIER PARK.

SEATTLE, WASH., Aug. 12.—No automobiles will be admitted to Mt. Rainier National Park henceforth unless they are provided with a permit from its superintendent, G. F. Allen, of Orting, Wash. Permits may be obtained for one year only.

A MAXWELL AMONG THE GIANT TREES.

Every school geography mentions the giant redwood trees of California, and usually has a picture showing a stage coach being driven through an archway cut in one, or a dozen men just able to join hands around the trunk. The up-to-date owner of a Maxwell runabout decided that these pictures were apt to give the youthful mind a wrong impression, and encourage them to believe that California was still a country of stages, cowboys and hold-up men; so, being a man of action, he immediately undertook to furnish a proper substitute. The result is the striking photograph printed below. Certainly no more startling contrast could be asked for than that between the little Maxwell and the giant trees to right and left of it.

Much has been written about these wonderful redwoods that are the peculiar product of Humboldt county, California, but scant justice can be done them from a description of their beauties, and they must be seen to be fully appreciated. A peculiarly romantic interest attaches to these forest monarchs when it is remembered that they are the only living things in the world that were alive when Cæsar marched his all-conquering legions through Gaul, and were saplings at the beginning of the Christian era. Some of them are declared by scientists to be at least 2,200 years old, and some are 300 feet tall.

Among the Giant Redwoods of Humboldt County, California, in a Maxwell Runabout.

LETTERS INTERESTING AND INSTRUCTIVE

WHAT MAGIC GASOLINE CAN THIS BE?

Editor THE AUTOMOBILE:

[1,508.]—I have for months pest read your very interesting "Letters," which are more or less instructive. I have read on all complicated matters but one, which, by accident, I happened to tbink I have not seen any inquiry nor reply. This is the quality of gasoline used in motor cars and its effect on the power produced. I own a four-cylinder air-cooled Franklin car. It is in perfect condition, runs fine, and I have only one objection to it, and thet is, that it has not power enough (12-horsepower) to carry me over eteep and long hills on high gear. I took a trip of 128 miles last week and through a very rough and broken country. I ren out of gasoline. I uee Standard Oil Company's gasoline when here. Not being able to buy any gasoline at any store there, I finally secured some at a drug etore. I started out end to my amazement I had from 35 to 40 per cent. more power. I went up almost any hill on high gear and when on the level, on querter open throttle, and my car, literally speaking, ran away with itself. What kind of gasoline could thie have been? I wrote this druggist but up to now have had no reply. Upon my return here I 'phoned the Standard Oil Company my experience. They say they have an 88 proof gasoline, but they cautioned me not to use it, as it is vory dangerous and extremely explosive. Could you enlighten me and possibly others by telling what kind of gasoline is best to use and to give the most power.

Chattenooga, Tenn. FRANKLIN.

We are equally at a loss as yourself to tell you exactly what kind of magic fuel the dealer in pills and ointments must have given you to account for the wonderful increase in power, but if he sold it at the usual commercial rates, we should certainly advise buying it from him by the barrel. Most of us have to be content with what the "octopus" hands out, for there is no other obtainable in the ordinary course of affairs. On the other hand, as your car has more than sufficient power for its weight to take it up anything but the steepest hills on the direct drive, and over level roads at a very good pace, we think you might find it profitable to look to the condition of the motor and its accessories as a means of accounting for its ordinarily sluggish action. The carbureter may be poorly adjusted for the fuel you use ordinarily, the valves may need grinding in or any one of half a dozen other things may require attention. The ordinary commercial gasoline will be found to give the maximum power obtainable in the modern automobile motor for everyday use, provided conditions are right, *i. e.*, the motor is in good condition throughout and the carbureter is adjusted to suit the fuel. The specific gravity of the gasoline now supplied is slightly lower than what it was several years ago owing to the largely increased demand for gasoline and the fact that the percentage of the lighter distillates in crude petroleum no longer makes it profitable to distill them except for special purposes and in comparatively small quantities. We are at a loss to explain what the dealer meant by "88 proof," unless he intended a specific gravity of .88 and there is mighty little of such light gasoline now to be had. It could only be more explosive by being lighter and hence, more volatile, but any grade of gasoline fit for use in a car will vaporize quickly enough to render an explosion imminent.

NO TRACE CAN BE FOUND OF THEM.

Editor THE AUTOMOBILE:

[1,509.]—Seeing letter No. 1,498, from George Briggs, I might say that I elso saw the advertisement he mentions and would like to obtain a copy of the book myeelf. I sent a post office order to the Lansing-Mahon Prcss, Chicago, but it did not reach them, and then I sent them a registered letter, but this wae also returned. I would like to know their preeent address.

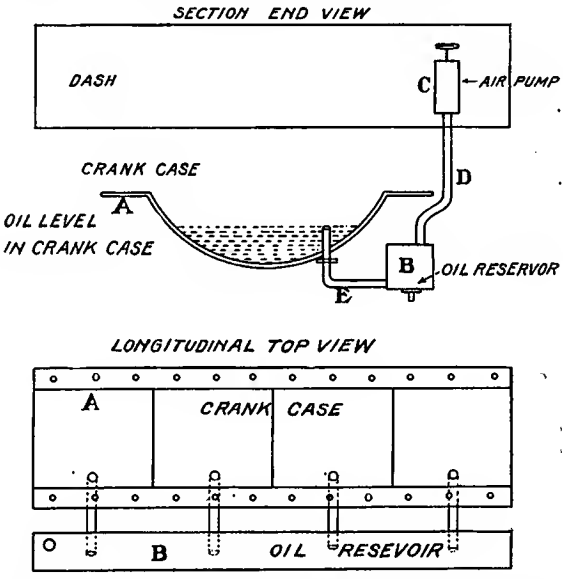
East Milton, Mass. THOMAS A. HUNT.

A great many other people, who were not as fortunate as you in having their money returned to them, would also like to know the present address of the concern in question, but it has disappeared, leaving no trace behind. (The book was entitled "How to Know Automobiles," and it was said to contain "1,000 distinguishing features; you can know any car at a glance."—Ed.)

ORIGINAL SYSTEM OF SPLASH LUBRICATION.

Editor THE AUTOMOBILE:

[1,510.]—I note with interest letter No. 1,495 and your reply concerning the best way for using splash lubrication. I would like to give your readers the benefit of a new eystem I have worked out. I have never seen a force pump that was absolutely reliable and I believe the proper way to lubricate the cylinders, camshaft, etc., is by splash, if the oil is alwaye kept at the proper height in the crankcase. My experience has taught me that the cranks should dip about 1-4 inch in the oil. I encloee a sketch showing my plan. AA crankcase, BB oil reservoir, C hand air pump on dash, D pipe leading from pump to top of reservoir, E pipe leading from bottom of reservoir up through each compartment of crankcase to the height oil should stand in the crankcase. Tbe top of oil reservoir should be located, say 1-4 inch, lower tban the desired height of oil in crankcase. This pipe through crankcase can be screwed in so it can be adjusted to proper heigbt; all pipes should be at least 1-2-inch, in order to allow a quick movement of the oil. A crankcase filled to the proper height with oil will lubricate an engine from 40 to 50 miles witbout replenishing. The working of the system is as followe: Give the air pump about a dozen strokes, which will force into the crankcase about one pint



Sectional Diagrams Showing Mr. Lanpher's Lubrication Plan.

of oil, and in every case pump more than is required. The surplus will, of course, quickly flow back to the reservoir, leaving the required amount in the crankcase. The pumping should be done about every 40 miles, or two or three times a day. By so doing you have positively and absolutely the necessary amount of oil in the caee at all times, no watching drops or guesswork about it.

What might be as well, or possibly better, is to dispense with the pump, and connect from top of reservoir to the exhaust pipe with open and shut valves located at a convenient place which could be opened for about one minute's time three or four times a day, or say four times for a 100-mile run, but in such case the valve or cock should be a three-way cock, so that when closed it would open an air passage to relieve the pressure in the reservoir so that the surplus oil in the crankcase could immediately return to the reservoir. The system is cheap, practical, and absolutely reliable. C. W. LANPHER.

Norwich, N. Y.

We agree with you that there is no more effective method of oiling a motor than by splash lubrication, and every car on the market to-day, regardless of the elaborate point to which its lubricating system has been carried, depends upon the splash in the crankcase to some degree. In fact, this is usually the foundation of the system, the force-feeds being more for the purpose of insuring a constant supply of oil at vital points. But the oil from these feeds eventually joins the supply in the crankcase and

is utilized for splash lubrication. We can also agree with you that the ingenious system you have devised is cheap, simple and practical, but hesitate at concurring in your statement that it is absolutely reliable. How can it be, when it depends entirely on the driver? To paraphrase George Ade, "If a patent auxiliary could be provided that would jump out of the oil reservoir every 40 miles, hit the driver a sharp kick in the pants and shout in his car, 'give the air pump a few strokes'," then we would be willing to say that it was all you claim for it, but as long as human nature remains what it is, any system that requires attention at such frequently recurring intervals as 40 or 50 miles hardly merits "absolutely reliable" as a recommendation. The personal equation is too strong a factor, and the driver is apt to forget it much oftener than where the oil supply only needs renewing every three or four hundred miles.

We have always been strong advocates of what may most aptly be termed the continuous circulating system of lubrication, in which oil is raised from a well situated beneath the crankcase to a reservoir or tank located alongside the engine, and from the latter dropped by gravity through liberal sized tubing to the crankcase, any excess overflowing into the well and again being raised or circulated. A sight glass located on the dash shows that the oil is running and with the exception of the pump, there are no small parts and no adjustments to make. On some cars, such a system is supplemented by a force-feed oiler, while on others it is depended upon as the sole means of lubrication. Experience has shown that the most effective and reliable systems of lubrication are those that depend upon the running of the motor for their action and not on the memory of the driver. We can readily understand, that having evolved your own method, you do not find it difficult to follow it out, but the many motors that have been ruined in the past five or six years through forgetting the oil tell a very different tale.

FUNCTION OF THE TORSION ROD.

Editor THE AUTOMOBILE:

[1,511.]—Please explain through "Letters Interesting and Instructive" the function of the torsion rod on the shaft drive automobile. Some machines don't use them and I cannot work out their office.

Quitman, Ga. W. MATHEWS.

When the manner in which the power is transmitted from the change-speed gear to the rear axle on the shaft-driven car is considered, it will be apparent that the turning of the shaft imposes a twisting strain on the whole rear end of the car and that if it were not for the frame and the weight of the car on the ground, there would be a tendency to revolve the rear of the chassis around the shaft, rather than to turn the wheels. But it would be bad practice to permit this strain to fall on the frame and hence the office of the torsion rod, which is designed to prevent its reaching that member. On cars that are not provided with independent torsion rods, it will be found that the housing of the propeller shaft has been made correspondingly stronger and that its support has been designed to enable it to act in this double capacity. This represents a simplification of design that will be found on quite a number of cars, as it eliminates a part exposed to mud and dirt.

EXPLAINING A LOSS OF POWER "ON HIGH."

Editor THE AUTOMOBILE:

[1,512.]—Kindly answer this question in "Letters Interesting and Instructive." I have a friend who has a single cylinder Oldsmobile which works all right on the low gear, but whenever it is thrown on the high or direct drive the engine dies right down and will not give any power.

Belleville, Pa. B. HARRY SMUCKER.

There are such a number of things that may be the cause of this failure of the motor to carry the load on the high gear that it is difficult to sum them up in a word. The compression may be poor, the valves may need grinding, they may not be properly timed, the ignition timing may not be correct, or it may be that the simple adjustment of the carbureter alone may correct the entire trouble. Owing to the very heavy flywheel used on the motor in question it will run light, *i. e.*, without load, even though badly handicapped by faulty adjustments or other defects, once started, and will apparently be operating normally until the load is applied. Start the motor and then gradually shut off the gasoline at the carburcter until it will no longer run without missing; open the valve again very slightly and fasten at that point. Speed the engine by advancing the spark and opening the throttle and see if the auxiliary air valve of the carbureter works properly, tightening or loosening the spring slightly until the motor works properly at all speeds. Look to the adjustment of the ignition timer as this was an extremely crude device on the Olds runabout. Once the motor can be run at all speeds without missing or apparently losing power while not under load, try it on the road. If the adjustments have been properly carried out, it will doubtless be found that the car will run all right on both speeds, as it is usually an improper carbureter or timing adjustment, or again, failure of the trembler to respond properly, that causes this apparent total loss of power when the direct drive is used, as a serious fault like loss of compression through worn piston rings or valves, would not prevent the motor from responding altogether, but would not permit it to develop anything like its normal output.

COUNTING THE R.P.M. OF AN AUTO MOTOR.

Editor THE AUTOMOBILE:

[1,513.]—Would you be so kind and answer me in your "Letters Interesting and Instructive" the following: Which is the easiest way to find out how many revolutions a gasoline engine makes per minute.

Haledon, N. J. EMIL LOEBEL.

The simplest and most convenient method is to apply a revolution counter to the end of the shaft. As few shafts are ever manufactured without the necessity, at one time or another, of being centered in a machine tool, a small countersunk recess will be found on the end. The pointer of the revolution counter is made to correspond with this recess, so that to use the instrument it is only necessary to insert it in the latter, maintaining sufficient pressure against the shaft to insure against loss by slipping. One man should hold a stop-watch, while a second operates the revolution counter. Take half a dozen consecutive readings of one minute each and average them up, and it will be found that this will compensate for any small errors in the handling of the watch and the counter.

MORE ABOUT REBUILDING AN OLD CAR.

Editor THE AUTOMOBILE:

[1,514.]—Referring to letter No. 1,488, by Douglass Adams, I will say that I installed the Bellfuss Motor, and, in fact, did all of the work of remodeling the Pope-Hartford Car, which he says works so admirably. And if it will be any help to Joseph Sylvester, of Jamaica, N. Y., will say that I have ordered a 10-12-horsepower Bellfuss Water-cooled Motor, to be installed in an Olds runabout. This 10-horsepower two-cylinder motor is to replace a 4 1-2-horsepower single cylinder motor, and when the job is completed I will let you know the result.

Keene Valley, N. Y. E. R. WELLS.

As there are a great many old cars that could be improved by the equipment of a new power plant and a few touches here and there, the cost of which falls far short of the expense of buying a new car of equivalent capabilities, we are always interested in learning the results of these attempts.

WHO CAN FILL THIS REQUIREMENT?

Editor THE AUTOMOBILE:

[1,515.]—As a subscriber to your valuable publication, I should be pleased to have you inform me if you know of any architect or builder's plans of private garages that can be purchased. I am thinking of building a garage at my country place here, big enough to house two or more cars.

Chatham, Mass. H. M. CARRUTHERS.

We do not know of any one at the moment, who makes a specialty of supplying plans for small private garages, but are under the impression that this is done and probably some of our readers can come to the aid of the inquirer.

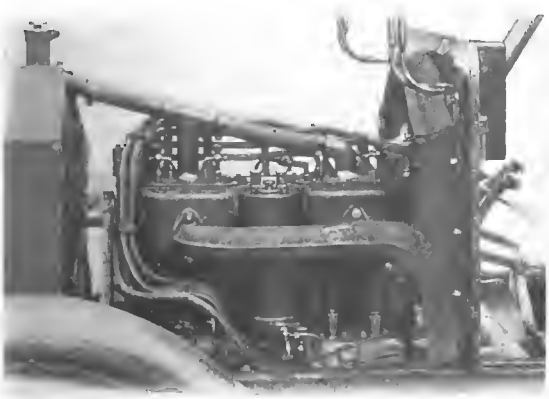
THE Packard Motor Car Company, of Detroit, is making the first deliveries of the new Packard "Eighteen" town car. This new Packard is exactly like the 1909 Packard "Thirty" in design and construction, but has smaller proportions to adapt it especially to the requirements of city and suburban driving of all kinds. It is furnished as a limousine, landaulet, runabout or five-passenger open car.

The four-cylinder, vertical, water-cooled motor is of 4 1-16-inch bore by 5 1-8-inch stroke, and is rated at 18 horsepower by the European system. The cylinders are cast in pairs, with water jackets and valve chambers integral. The castings for cylinders, exhaust manifolds, pistons and piston ring blanks are made in France from especially adapted gray iron. The pistons are ground and fitted with four ground rings. Cylinders, pistons, and rings are lapped together with a polishing agent to obtain an absolutely perfect fit between them.

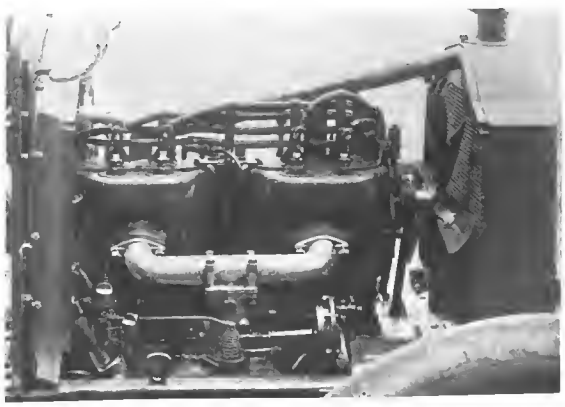
The crankshaft is like that of the Packard "Thirty," which is noted for extreme accuracy, due to special manufacturing and inspection methods. All bearing surfaces are ground. It runs on three large bearings, bushed with Parsons white brass. The connecting rods are drop forgings. The crank pin bearings are bushed with Parsons white brass and the piston pins with Packard special bronze. The inlet and exhaust valves are on opposite sides of the cylinder, all mechanically operated and interchangeable. The camshafts are enclosed within the motor crankcase, being fully protected from dirt and certain of luhrication. The new system of camshaft drive gears insures long life and silent running. All camshaft as well as magneto and water pump gears are contained in a separate but integrally cast oil-tight extension.

The crankcase is cast of special aluminum alloy in three horizontal sections. The uppermost section forms the engine base and is supported directly on side members of the main frame of the car. On each side, between the transverse supporting arms, is a horizontal, integrally-cast web, entirely enclosing the space between motor and frame, thus affording complete protection to motor, magneto and other parts. The crankshaft bearings are held between the uppermost and middle sections. Extreme rigidity of the main bearings is obtained by massive webs. The bottom section is an oil well, easily removable for inspection or adjustment of connecting rods, camshafts, etc., without disturbing the crankshaft bearings. The crankcase is divided into front and rear compartments by a central partition, which supports the middle crankshaft hearing and serves to stiffen the case.

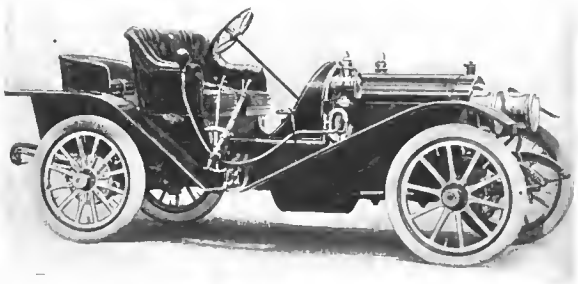
The carhureter is of special Packard design and construction, of the float-feed, aspirating nozzle type, with automatic auxiliary air inlet. The cylindrical and vertical mixing chamber has an aspirating nozzle in its lower portion and a butterfly throttle above, to control the quantity but not the



Packard Features on a Smaller Scale.



Essentially a Replica of Packard "30."



Lines of Packard "18" Runabout.

quality of the mixture. The auxiliary air inlet is a poppet valve under control of an adjustable coil spring and automatically governs the intake of air to keep the mixture at correct proportion for all engine speeds. Spring tension to suit different atmospheric conditions is regulated by a small lever on the dashboard. The carbureter is kept at uniform temperature by warm water circulating through a jacket surrounding the mixing chamber. For starting in cold weather there is provided a primary air intake shut-off, operated from the front of the car near the starting handle.

Water circulation is positive by means of a gear-driven centrifugal pump. A special feature of this pump is its hydraulic-pressure lubricated thrust bearing. The radiator is of the cellular type, combined with the tank. Forced draft to increase cooling efficiency is obtained by a belt-driven ball-bearing fan adjustably mounted on the forward cylinder.

Dual Ignition Is Part of Regular Equipment.

Ignition is by jump spark, the current being obtained from an imported Eisemann low-tension magneto, mounted on the left side of the motor bed and direct gear-driven by enclosed gears. A Fulmen imported storage battery, for starting the motor from the seat, is always in reserve. A transformer coil for the magneto current and a vibrator coil for the battery current is arranged as a unit in a box on the dashboard, with a single hand-lock switch between. The commutator for the battery primary current is on a vertical shaft at the rear of the motor and is driven from a camshaft by enclosed bevel gears. The distributer, high-tension wires and spark plugs are common to both magneto and battery systems. There are universal knife switches at the plugs..

Lubrication is by splash, from the crankcase to cylinders and all motor bearings. Oil is pumped separately to the front and rear compartments of the crankcase, in each of which is maintained an independent level of oil. The double plunger oil pump, with adjustable strokes, is accessibly located at the left of the motor and is driven by a worm on the exhaust valve camshaft. Oil is pumped from a vertical copper reservoir close to and between the pairs of cylinders, so that the oil will be warm and kept in fluid, easily flowing condition even in coldest weather. There are two drip sight feeds on the dashboard. The crankcase drain cocks have anti-clogging devices.

The New Packard as a Landaulet.

The motor speed is regulated by an effective and easily controlled hydraulic governor incorporated in the water circulating system and acting directly on the butterfly throttle. A pedal cuts the governor out of action for instantaneous acceleration and high-speed running. The throttle also is under control of a hand lever on the steering wheel. Another lever on the steering wheel advances and retards the spark.

The drive is through a Packard type internal-expanding clutch which insures gradual engagement. The expanding ring within the flywheel rim is actuated by an adjustable screw-and-nut device. The propeller-shaft, connecting the clutch with the transmission gear, has an effectively encased universal joint at each end. The speed-changing set, bevel gear final drive and differential gear are contained within a rigid aluminum housing forming a rear axle unit. The housing is internally ribbed and is provided with inspection holes. The differential gear unit is supported by its own bearings, so that the live rear axle may be withdrawn without disturbing the gears. Three forward speeds and reverse are obtained by sliding gears, third speed forward being direct drive. Gear shifting is easily and progressively accomplished, as the actuating slide rod is annularly grooved to correspond with spring-retained spacing dogs, which determine the correct positions of gear engagement. The single speed-change lever gives the reverse by a lateral movement. All gears in the transmission, final drive and differential and the rear axle, run on imported annular ball bearings.

There are four brakes, all acting on rear wheel brake drums. The external contracting brakes are operated by a pedal for regular use, and the internal expanding brakes are operated by an emergency hand lever. A drum disc entirely encloses and protects each internal brake.

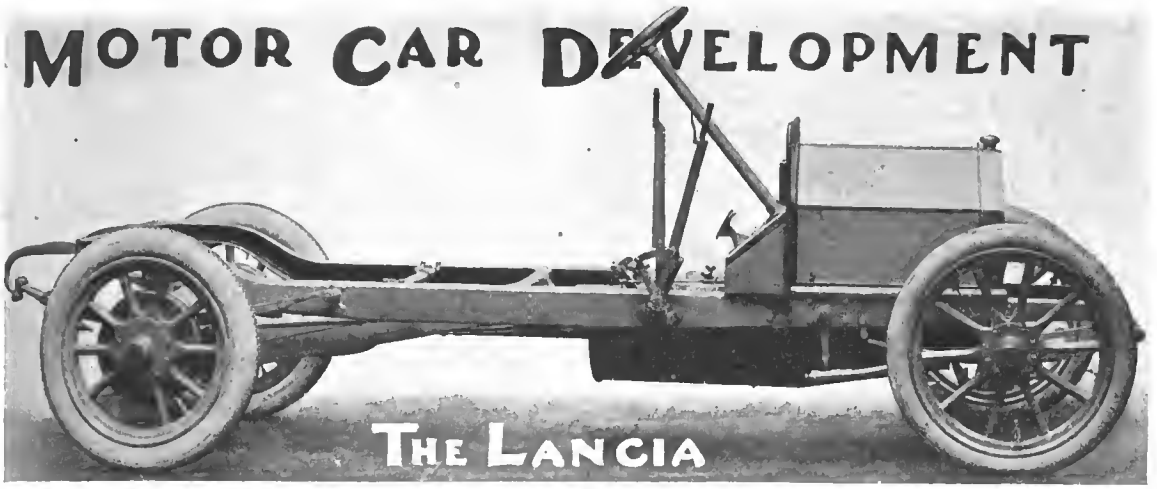
Steering is by a large hand wheel, on a large, rigid column, with worm-and-sector gear. The worm and sector are forged integrally with their respective shafts. The steering spindles and jaw type yokes are drop forgings. The steering connecting rod between the hand wheel gear and the steering knuckles is placed above the front axle to minimize jar on the hands. The steering knuckles have imported ball thrust bearings. All steering connections have grease cups.

Specification of the Chassis Foundation.

The running gear is of channel section, pressed steel: arched above the rear axle to provide ample spring action without raising the body. The top and bottom flanges of the side bars have integral gussets for the reception of the cross members. All rivet and bolt holes are drilled in full-length jigs. There are four wide, semi-elliptical springs, 40 inches long in front and 50 inches long in the rear. The front axle is steel tubing of large diameter and heavy gauge. The stationary sleeves of the rear axle are steel tubes pressed into and riveted within flanged collars bolted to the differential housing. The wheel base is 112 inches and the tread 56 1-2 inches. The tires, front and rear, are 34 by 4 inches.

The runabout wheelbase is 102 inches, instead of 112 inches. The motor and driver's seat are farther back on the frame than in the open car, to properly distribute weight. The steering post has greater rake, and the divided front seat is lower. The gasoline tank is on the rear of the frame, the gasoline feed being by a simple automatic pressure system. There is a rumble seat above the gasoline tank. The standard tire equipment is 34 by 3 1-2 front and 34 by 4 rear. Otherwise the runabout specifications are the same as the open car. The price of the Packard "Eighteen," with limousine body, in standard finish and equipment, is $4,300; with landaulet body, $4,400, and as an open car or runabout $3,200.

MOTOR CAR DEVELOPMENT

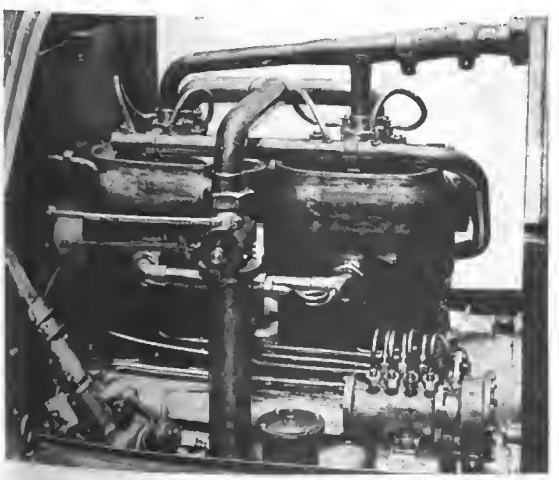


THE LANCIA

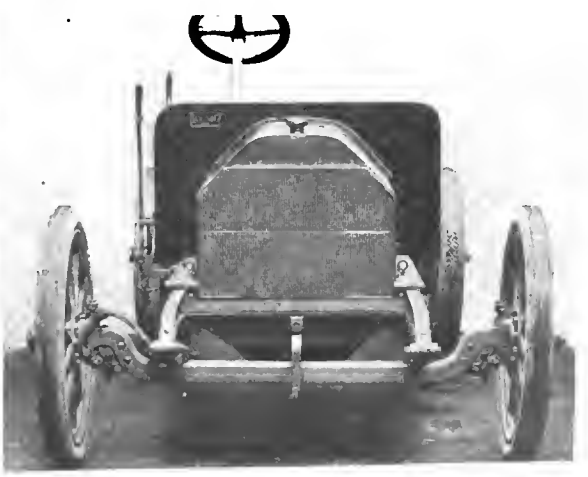
PILOTING a racing car has usually proved to be but the stepping stone to further and more substantial advances in the automobile industry, but it is not often that a racing driver branches out for himself as a designer and constructor of cars. This, however, is what Vincenzo Lancia, who is as well known on this side of the Atlantic as on the other, through his work in the Vanderbilt races, has been doing since he severed his connection with the Fiat house. The Lancia car has been on the market abroad since early in the year, and is now being handled in this country by the Hol-Tan Company, 244 West Forty-ninth street, New York, Harry Fosdick, sales-manager of the latter concern, giving special attention to its introduction here.

As is customary on the other side, its rating is very modest, but at 1,400 r.p.m., its compact power-plant develops 25 horsepower. The reproductions from photos shown herewith depict this small model. Its motor has the cylinders cast in pairs, the dimensions being 90 mm. by 100 mm., or 3.5-inch bore by 3.9-inch stroke, and in the majority of respects it closely follows approved Continental lines. However, it has several exclusive features, such as the twin-jet carbureter, each jet being located in a mixing chamber of its own, one being used for low speeds, while both come into action at a predetermined position of the rotary throttle located above them. The carbureter is water-jacketed and the auxiliary air valve is of the dash-pot type. A high-tension magneto is employed for ignition, which is fixed, and both the magneto and water pump are placed on the valve side of the engine. The carbureter is located on the other side and a special distributing oil pump operated by a transverse shaft and skew gearing is also placed there, as shown by the accompanying photograph of the motor. Throttle control is by means of a small reel incorporated in the rim end of one of the steering wheel spokes in the manner that has become familiar on the Panhard cars, except that the reel can easily be rotated with the finger.

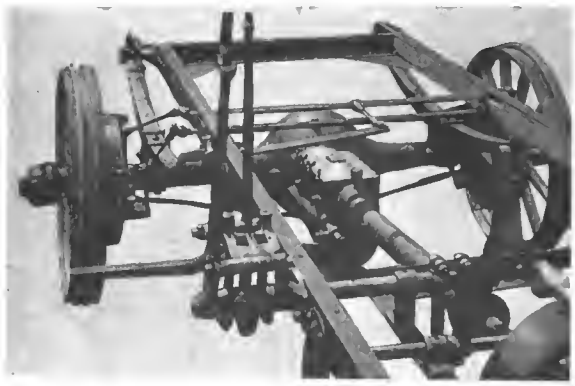
The front axle, which is of pressed steel of U-section, like the side members of the frame, and the suspension of the motor and gear-box are features of interest. The lower half of the crankcase and the gear-set housing are cast integral, provision being made for the reception of the flywheel and multiple disc clutch. The completed unit is bolted directly to the side members of the frame in six places, three on a side. Extending arms are cast at the front of the crankcase and the rear of the gear-set housing, making four points of support, while what may be termed the aluminum frame on which these two essentials rest, is also extended to touch the frame where the casting is spread to avoid the flywheel. Final drive is by shaft running in a sleeve to the live axle, which has a webbed differential case divided vertically and supported by a pressed steel torsion rod. The brakes are all of the metal-to-metal type. In addition to the foregoing model, a 30-horsepower six-cylinder car has also been on the market during the past half year or more.



Off Side of Motor, Showing Carbureter and Oiler.



Head-On View, Illustrating the Novel Front Axle.



Correja Rear Axle Assembly, Including Gear Box.

A NEWCOMER—THE CORREJA.

A good-looking newcomer to the automobile trade is the Correja, manufactured by Vandewater & Co., of Iselin, N. J. Although of good size and ample power, it belongs in the medium price class, selling complete for $1,900. The motor is of standard design, having its four 4 3-4 by 5-inch cylinders cast in pairs, with all valves on the right side actuated by a single camshaft. Timer and oil pump are on a vertical shaft at the rear of the motor. The spark coil and switch are mounted on the dash, which is otherwise unencumbered; dry batteries are regularly used for ignition, although provision is made for mounting a magneto as an extra. The cooling is taken care of by a square-tube honeycomb radiator with belt-driven fan and centrifugal pump. A leather-faced cone clutch and enclosed shaft transmit the power to the change-gear, which is carried on the rear axle. The three speeds forward and reverse are controlled selectively. The frame is of steel filled with wood, carried on long semi-elliptic springs. The wheelbase is 110 inches and the wheels are 34 inches in diameter, shod with 3 1-2-inch tires in front and 4-inch tires in rear. A five-passenger touring body is regularly fitted, but a runabout will also be made. The manufacturers have made no attempt to bring out any startling novelty, but rely rather on good workmanship and solid construction. In spite of the moderate selling price no expense has been spared to produce a thoroughly high-grade car; as an example may be mentioned the radiator, which is one of the costliest types made. Several of these cars are already in use in northern New Jersey and the owners report that they are giving excellent service. The company will establish agencies for the sale of the 1909 model and open up a wider territory than before, having previously confined its efforts to home territory in the marketing of its limited output.

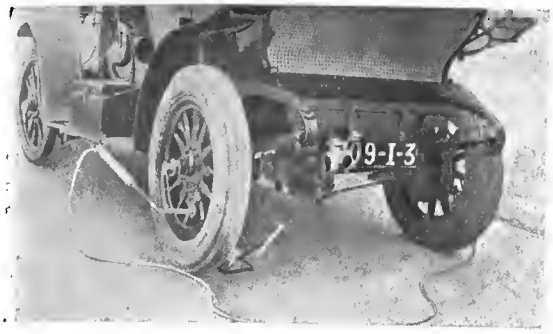
Quartering View of the 1909 Correja as a Touring Car.

NEW MODEL OF THE POPE-WAVERLEY.

Under the title of Model 70-C, four-passenger victoria coupé, the Pope Motor Car Company, Indianapolis, Ind., has recently brought out the attractive looking electric car shown by the accompanying photograph. It is a vehicle that possesses all the adaptability of the two-passenger type for the requirements of city work, but has been designed to have a wider range of usefulness as an all-round vehicle in that it makes a comfortable and stylish equippage for theater parties or other occasions where four passengers are to be accommodated. It is quite as roomy as the conventional horse-drawn brougham, beside being much more speedy and dispensing with the coachman. Removing the coupé top transforms it into an open victoria phaeton.

The power plant consists of a single motor of special Pope-Waverley design and capable of standing an excessive overload. It is supplied with current from a battery of 30 cells of 11 plates each, 10 of the cells being placed in the forward compartment and 20 in the rear, thus making an equitable distribution of the weight which gives easy and comfortable riding. The drive is by means of the noiseless "herringbone" type of gearing that has always characterized the Pope-Waverley cars, the pinions being protected by dust-proof cases and running in oil. Steering is by side lever and a combination volt-ammeter is provided. There are two foot brakes and one electric brake. The body measures 89 inches over all, while the wheelbase is 68 inches and the tread 54 inches. The running gear consists of wood artillery wheels, 30 inches in diameter and fitted with 4-inch detachable pneumatics of standard make. The top is finished in broadcloth to match the upholstery, but can be replaced by a full leather top when desired. With a removable coupé top, the car lists at $2,150. An excellent idea of the very attractive lines of this latest addition to the Pope Waverley family of electrics may be had from the accompanying illustration. The method employed of dividing the battery between the special compartments provided for it fore and aft, lends itself admirably to the production of a body that is not only well-balanced mechanically, but also artistically. The underbody has been freed from encumbrances in this manner, without raising the center of gravity.

Pope-Waverley Electric Victoria Coupe.



Banche Tire Inflator, as Attached to Car and Applied to Tire.

TIRE INFLATOR OPERATED BY MOTOR.

PARIS, Aug. 10.—Tire inflators operated by the motor have been put on the market in such quantities that the introduction of another one, though it is a model of simplicity, will probably not make any serious difference. The Banché system, which has just been introduced to France, makes use of the ordinary hand pump with the addition of five extra parts. A metal bearing is fitted under the running-board of the car, about a foot from the rear end, and is disposed to receive a steel spindle secured by a cotter pin, a couple of inches only projecting. To the base of the pump is attached a special socket which fits on the projecting pin, a cotter pin securing it. Instead of the ordinary pump handle there is a tube screwing into a bracket permanently attached to two of the spokes of the rear wheel. The result is an ordinary pump attached to the running-board, but free to turn in its bearings, and the piston secured to an arm projecting from one of the spokes of the rear wheel. On one side of the car being jacked up, the engine started and the low gear put in, the pump goes into operation. Naturally, only three tires can be inflated with the apparatus in position. To inflate the fourth one it is necessary to transfer the pump to the opposite side, a simple matter, however, seeing that the bearings are carried under each running-board and the apparatus is reversible. The only permanent visible attachments are brackets on rear wheel.

TRACY TESTS THE G-L ECONOMIZER.

In order to show exactly what could be accomplished with the aid of the G-L Economizer, the American agents, the G-L Patent Economizer Company, retained Joseph Tracy to make a test of it under the ordinary conditions of everyday running. The purpose was to discover exactly the distance a car could be driven with the economizer in operation, as compared with the mileage it could make without this aid. The fuel used in both cases was ordinary commercial gasoline purchased at retail, the tests being made in New York City during the month of June. The car was a 24-horsepower, four-cylinder Buick and was driven over the same route in making the tests with and without the economizer in operation. The atmospheric temperature ranged between 50 and 80 degrees Fahrenheit during the course of the tests.

The carbureter was of the ordinary float feed, spray nozzl type, fitted with an auxiliary air valve. On June 16 the car used for the test was driven 17.8 miles on a gallon of gasoline, with the economizer attached, but not in operation. Two days later the same car was driven 24.6 miles per gallon over the same route and with the same fuel and conditions, except that the economizer was working, the latter accordingly showing a gain of 6.8 miles per gallon. The average speed maintained throughout the tests was about ten miles an hour, and on both occasions the car was driven on the high gear except when starting. The clutch was not disengaged in either test when the car was running down hill, the desired retardation being obtained by closing the throttle and so utilizing the braking effect of the motor.

ANOTHER "BUGGYABOUT" TYPE MAY APPEAR.

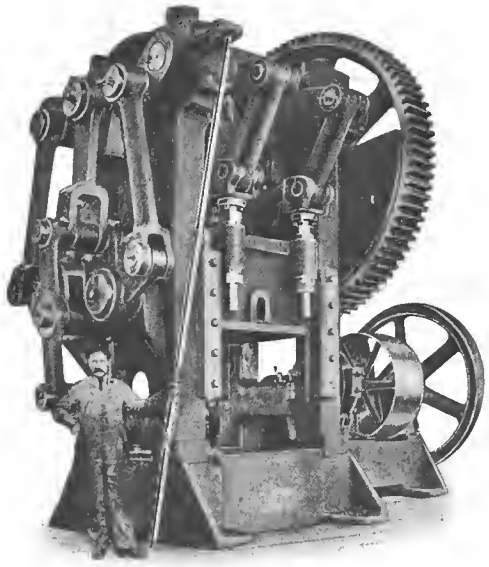
SYRACUSE, N. Y., Aug. 17, 1908.—Within a year Watertown, 70 miles north of Syracuse, will be substantially interested in the automobile manufacturing industry. The H. H. Babcock Company, one of the largest carriage-making concerns in the world, has adopted plans for an 80 x 25-foot building near its present large plant, and will therein manufacture gasoline engines and gears for automobiles, to later embark in the business of making the entire machines.

It is stated by the company that the style of the vehicle is more on the plan of a carriage than the present form of machine, and the car will be built with a view to comfort and lightness and ordinary road and hill climbing rather than for speed purposes, and will be sold at a comparatively reasonable figure.

HUGE PRESS FOR STAMPING AUTO PARTS.

To the large and interesting line of heavy stamping and forming presses in operation at the works of the A. O. Smith Company, Milwaukee, manufacturers of automobile parts, has been added what is claimed to be the largest double-acting press on earth. This is an enormous double-acting toggle press, weighing more than 82 1-2 tons, measuring 23 feet in height and resting on a foundation of solid concrete extending many feet below the floor. It is liberally made of solid cast steel, and the bearings are bushed with phosphor bronze. The main shaft is forged from a billet of steel of special mixture of highest resistant qualities, and is 13 inches at its greatest diameter, with a stroke of 26 inches. This machine exerts a terrific pressure, but does it with the greatest ease. The dwell of the blank holder, when bearing down on the work, covers a greater arc of the circle than is possible with any other system of toggle action. The teeth of all the gear wheels are cut from the solid and the main shaft gear wheel is nine feet in diameter on the pitch line, five-inch circular pitch, fifteen inches face.

The press is timed to make five complete strokes per minute through a gear reduction the ratio of which is 50 to 1. The large balance wheel weighs two and a half tons, is eight feet in diameter, and runs 250 r.p.m. The machine is under complete control of the operator at all parts of the stroke. The press was designed for deep drawing of sheet steel, and especially for the making of crankcases, transmission cases, drawn dashes, axle housings, brake drums and many of the automobile shapes which are now made of aluminum.



Powerful Press Lately Installed at the Smith Plant, Milwaukee, Wis.

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DRASTIC MEASURES MUST BE TAKEN.

In its appeal to members of out of the State clubs to respect Connecticut's model law by refraining from all reckless speeding when they tour in the "Nutmeg" commonwealth, the Automobile Club of Hartford sounds a note of warning, the effect of which should be heeded the country over, and that without delay. That the situation, where the criminally reckless use of the automobile by a few, is now very grave is evident from the fact that the national body, the American Automobile Association, has deemed it expedient to send a hurried warning to its 20,000 odd members, scattered throughout the United States, that unless matters immediately improve in this respect drastic legislation is bound to follow next winter, particularly in New York and Connecticut. Other States will naturally follow suit, and all hope of the enactment of a uniform law, or of Federal legislation, will be indefinitey deferred.

It is particularly hard on autoists in Connecticut, which is distinguished for the common-sense leniency of its law, that visitors from other States should so despicably abuse their privileges, leaving in their wake a train of righteous indignation which will react upon the innocent and guilty alike. Conservative estimates place the proportion of reckless speeders at about 10 per cent. of the autoing fraternity, and they may be divided into two classes—*parvenus* with more money than sense, to whom fines are nothing, and professional drivers trying to show off for the benefit of their friends. For these irresponsibles the whole automobiling body must suffer, unless drastic measures are taken to suppress them. Scarcely a day passes but what one of this class is the moving cause of a homicide, or a suicide, though the number who meet a well-deserved fate appears to have but slight effect in depleting the ranks.

Legally, as well as morally, the man who speeds a car from 40 to 60 miles an hour on an open road, and ends by killing some one, is guilty of a homicide, but not until he is considered as such will it be regarded as anything but a pastime. But it should not be necessary to wait until some one has been killed before attempting to impress upon the members of this class that such driving may mean a jail sentence, instead of the slight pecuniary loss that has hitherto been deemed sufficient punishment. Until the 90 per cent. of law-abiding autoists combine with the authorities to suppress all such criminals the obnoxious practice of trapping will continue to snare the good and bad alike, and to keep alive the prejudice against autoists generally that would have no reason for existence otherwise.

* * *

THE JOYS OF AUTUMN TOURING.

No great poet has yet risen to sing the joys of touring. Can it be that even in these prosperous times the poets must still tramp afoot? Can they not even find some compassionate friend to give them a first taste of the road? Surely this is a grave fault, and one that for the good of our literature should be remedied. True, Mr. Kipling knows the touring spirit; he has breathed it into his song of the "Red Gods," who call from the sea, from the Northern lakes and forests, from the jungles of Burma and the snow-capped mountains. The Red Gods call no less strongly from the dusty highroad, and the city dweller hears and goes forth to seek them.

Some remember friends and relatives long unvisited; some must attend a convention in a distant city; but others there are, and these feel the truest joy, who go for love of the going—for the long, warm, quiet hours, the purr of the motor and the rush of the wind. No schedule must be kept, no record broken. They rise early, and start while the sun is still low in the East and the dew sparkles on the grass; they eat their luncheon in the shade by the roadside, and wash it down with cold water from a farmhouse well; and, in the eventide, tired and dusty and hungry, they reach the hotel and rejoice in the supper, the bath and the bed, and the deep, unbroken sleep. Nothing can mar such a day; a wrong turn at the crossroads, it means but ten miles more, and a punctured tire is a source of merriment. Two weeks, or three, may-hap, of that life and a man returns to his desk strong, browned, and clear-eyed, made ready for the work of another year by a process equaled by no other.

Many will take the road this Summer and Autumn for the first time; many others, perhaps, still hesitate, drawn by habit toward the crowded seashore, half fearing this new thing. Try it for a while, at least. Grind in the valves, if they need it; wash out the cylinders with kerosene, and pack the gear-case and differential with fresh grease. Then set out, light of load and light of heart, to learn the road that never ends.

FIRST ENTRIES FOR VANDERBILT CUP CLOSE SEPT. 1

WITH the day of the closing of the first installment of entries for the Vanderbilt Cup race drawing near, the date being September 1, the probabilities point to next week's seeing the beginning of the influx of the final nominations of candidates for blue ribbon racing honors in this country by makers seeking to avoid the double fee to be exacted after the closing up to October 1.

The progress made in the building of tbe 11-mile stretch of the Long Island Motor Parkway, which is to be the home-stretch of the course, and the publicity it has received in the metropolis and throughout the country, have aroused the trade and followers of the sport to the great interest New Yorkers and Americans at large are taking in the annual historic struggle.

The fame and permanent advertising to be gained by a creditable performance in the Vanderbilt Cup contest are appealing strongly to makers and more than one sees a chance, not only of an unequaled speed demonstration of his cars, but of victory itself as the outcome. Not a few are sizing it up as a chance worth taking with stripped cars that have shown themselves easily capable of maintaining an average rate over such a course that will well compare with past Long Island performances and place them far outside of the luck of the racing game.

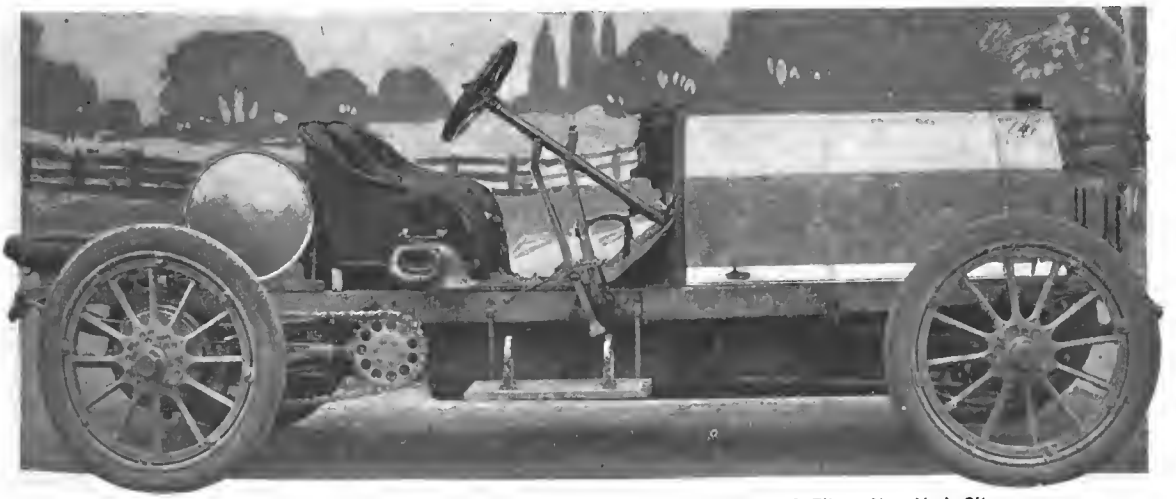
One of the first Vanderbilt Cup cars to be taken on the road is the Acme Six, which was entered by Cordner and Flinn of New York, agents for the Acme in the metropolitan district. The racer is already undergoing its preliminary tests, and as soon as enough of the new cement parkway is completed, it will be taken out on Long Island and tried out over the course. A technical description of the car has already been given in these columns. The engineers at the Acme factory rate the engine at 60-horsepower, and it has been tested up to nearly 2,000 revolutions per minute under constant load for some time.

Club Offers Money and Reiterates Suspension.

The latest news in reference to tbe A. C. A. event at Savannah under European rules is in the form of an announcement that $8,000 will be given in cash prizes to the drivers, divided into $4,000, $2,000, $1,000, $750 and $250. It is an admitted fact that the foreign entries are not quite as plentiful as expected; hence the cash prize offers.

The press notice reiterates the threat of disqualification for Vanderbilt Cup participants "from competing in any future international races held in America or in Europe." It is apparent that the club is prepared to spend a generous amount of money in retaining its greatly prized "foreign relations."

Harry S. Houpt, head of the concern handling Thomas cars in New York City, has accepted membership on the club's contest committee. Much comment has been expressed at the presence of Mr. Houpt on thc committee, in view of the fact that the non-acceptance of the so-called international rules had its principal reason in giving opportunity to the E. R. Thomas Motor Company and the Locomobile Company of America to use racing cars already constructed which would not have been cligible under other rules.



Acme Six-Cylinder Racer Entered in the Vanderbilt Cup Race by Cordner & Flinn, New York City.

FRENCH NOT CRAZY TO RACE IN AMERICA.

PARIS, Aug. 10.—There is something strongly suggestive of the revivalist preacher in the methods of the European publicity writers of the Automobile Club of America. Eternal damnation in the form of disqualification from the Grand Prix, the Ardennes, the Italian races, and even all local events, is painted in lurid colors for the benefit of all those who have dared to cast their eyes towards the cup that will be competed for on Long Island in the Fall. The official publicity man has even gone to the extent of deducting 100 pounds off the maximum weight, announcing in black type that no car must weigh more than 1,100 kilograms. This caused Victor Breyer, the A. A. A. delegate in France, to break his silence, announcing that the weight had been fixed at 1,200 kilograms, and that any car which had competed in the French Grand Prix would be accepted for the Vanderbilt Cup race.

The news having got abroad that Lautenschlager was to drive in the Vanderbilt race, it was the turn of the publicity man to single him out specially, point to tbe error of his ways and ask him point blank to repent while there was time.

A bright note is occasionally brought into the daily epistles by a recital of the prodigious wealth of the club and the men who are behind it. After hearing into what a world of opulence they can enter by engaging in thc Savannah race, the wonder is that entries do not flow. Up to the present, however, all that is announced is a list of the firms who might enter, and the list comprises every important factory in Europe. There appears to be a better understanding of the situation by European manufacturers, and, whether cursed or blessed, they can bc relied upon to enter in tlie race which will give them the greatest amount of material benefit. Of course their American agents will have to help pay the bills, which will be considerable.

Part of State Highway for Lowell's 250-Mile Race.

LOWELL ENTRIES COMING IN RAPIDLY.

LOWELL, MASS., Aug. 17.—Present indications are to the effect that there will be little or no difficulty experienced in obtaining the maximum number of 12 entries fixed for the 250-mile road race to be held here on Labor Day, September 8, for the Butler Ames trophy. In the promotion of this, John O. Heinze, of the Heinze Electric Company and president of the Lowell Automobile Club, is the prime mover, and having successfully overcome the various obstacles which sprung up to prevent the holding of such an event on the Massachusetts highways at an earlier date, Mr. Heinze is now devoting his attention to securing entries. Up to the present, these consist of two Knox cars, drivers not nominated; an American, to be driven by Stewart; a Simplex, for which Lescault has been nominated as driver; a Zust, Al Poole's Isotta and Ralph De Palma's Fiat, while there may be a second Isotta, to be handled by Lewis Strang.

Contrary to the usual custom of starting road races as soon after daylight as possible, the cars will not be sent away until 10 A.M., and the start is to be located at one end of what is known as the "Speedway," which is a 75-foot macadam stretch paralleling the bank of the Merrimac River for two miles. This roadway forms a part of the Lowell park system and it will be turned over to the race promoters for the day. It is supplemented by a 25-foot strip separated from the main road by a grass-bordered walk and trees, which will provide unequalled facilities for parking cars, while the grandstand will be located opposite and at the end of the wide strip in order that the spectators may have a full view of the cars as they come down this broad two-mile stretch, on which phenomenal speeds are anticipated. The stand is to be 1,700 feet long and will have a seating capacity for 10,000 people, while the parking space will accommodate a large number of cars.

Upon leaving this stretch, the course strikes the State highway, which is a macadamized road winding along the Merrimac for a distance of three miles. Including the "Speedway," this constitutes what the promoters term "the main five-mile stretch," which has no turns on it that cannot be easily taken at 50 miles an hour, or better. This stretch ends at Tyngsboro bridge with something like a hairpin turn, though the road is well made and in good condition. Here the cars will strike the backstretch, which consists of a winding country road varying from 10 to 25 feet in width, and having grades ranging as high as 10 to 12 per cent. There is only one bad feature to this part of the course, and that is the presence of the tracks of a street railway on a part of it, but no cars will be run on the day of the race. The entire highway is now being put into first-class condition by the City of Lowell, the Town of Tyngsboro, and the Massachusetts State Highway Commission.

By the day of the race the whole length of the course will have been thoroughly oiled and it will be all wired off. In addition to this protection, there will be 500 to 700 special policemen sworn in by the authorities of Lowell and Tyngsboro. Communication with the different parts of the course will be provided by five telephone stations.

The prize to be raced for is the Butler Ames trophy, presented by Colonel Butler Ames, who is a grandson of Benjamin Butler, and a partner of John O. Heinze's in the Henize Electric Company. The race was originally planned for July Fourth, but it was found that military protection could not only not be obtained, as had been anticipated, but the Massachusetts statutes prohibited the holding of such an event on the highways of the State. But the Lowell Automobile Club, under the auspices of which the race is being held, succeeded in having a special bill put through the Massachusetts Legislature, allowing the use of the public highways for a speed contest.

A ROAD RACE IN FAIRMOUNT PARK?

PHILADELPHIA, Aug. 17.—Next October this city will have a Founders' Week celebration, when all the scattered sons of the Quaker City the world over will hie them back to the old burg to participate in the enjoyable program which is already near completion. One of the sub-committees appointed is the automobile committee, W. Wayne Davis, chairman. This committee believes that the Founders' Week program will lack completeness without some red letter motor event to keep the people interested. To that end the Quaker City Motor Club, through its secretary, H. C. Harbach, has petitioned the commissioners of Fairmount Park for permission to use certain roads in the western section of that popular pleasure ground for the purpose of running off a 200-mile stock car race, the event to be decided between 6 and 10 o'clock on any morning during Founders' Week suitable to the authorities. The club proposes to defray all the expenses of such an event, in return for which it asks for the unrestricted use of the roads on the day of the race and for practice during the early morning hours of the week preceding from daylight to 7:30 A.M. City officials generally favor the scheme, and although there is a speed limit provided for in the Park regulations, there is another proviso which allows the commission to set aside the Park roads for any purposes which it may deem desirable.

Officials of the Quaker City Motor Club, before making the request of the commission, carefully ransacked West Park for a suitable course, and have already evolved a 7 1-2 mile circuit, which, with banking at some of the sharp turns and a cut-off or two, can be made as safe as the average Vanderbilt course. With an aggregate of a quarter-mile of specially built new road, the length of the course could be increased to upwards of 10 miles. Philadelphians—officials and private citizens alike—are naturally proud of their splendid park, and would hesitate to allow any event in its limits which might mar its beauty in any way. But the Quaker motorists have made it plain that while providing a grand public spectacle to add to the Founders' Week hilarity, they will do so at their own expense and restore the roads to their former condition, and there is in consequence a strong sentiment in favor of giving them a chance to make good. The commission has promised to act upon the application and announce its decision at its next meeting; and it is quite generally anticipated that this may be in favor of the race promoters, in which case entries will be obtained at once.

How They Climbed at Algonquin

Leland and the Winning Stearns

Chicago, Aug. 15.—The most unique hill-climb in the country was contested yesterday at Algonquin, Ill., where the Chicago Motor Club successfully ran off its third annual contest. The star performer was F. W. Leland, in the Stearns six-cylinder, who won the trophy hung up by the citizens of Algonquin for the best total time of the day, which included the smashing of the Phillips hill record; the Apperson and Knox getting the mark on Perry hill, the standing start climb in the morning.

Chicago's hill-climb differs from others in that the majority of the events are run under a handicap formula whereby the cylinder capacity is multiplied by the time and this result divided by the weight. Then, too, there is the added novelty of a double climb, one from a standing start up Perry hill, about a quarter of a mile in length and of an average grade of 8 per cent.; while the other is a flying start one-half-mile dash up Phillips hill on the other side of the town, a sporty proposition because it is possible to go up the grade at almost unlimited speed. The two hills are totally unlike. Perry hill has an awkward turn about 100 feet from the start, so it is hard to get up any kind of speed at the beginning, while once around the turn the steepest part of the grade confronts the driver. Near the top there is another turn, but here the grade is not so steep and greater speed is possible. Phillips hill affords a fine take-off, so that as the car flashes over the tape it is at top speed. The rise is gradual, but near the top there is a bad bend which sends the big cars skidding across the road before they can square up for the dash to the tape at the finish line.

The greatest crowd that ever witnessed a Chicago Motor Club event watched the sport. There must have been fully 300 cars, most of them having been driven from Chicago. The climb was the one that was postponed from last May because of the streak of bad weather. For a time this week it looked as if another postponement might be necessary. But the crucial day was perfect so far as the weather and the temperature were concerned. If anything the hills were not quite as good as last May, but the drivers did not seem to mind this, for there was a general shattering of the records that speaks volumes for the speed of this and next year's crop of cars, for mixed in the field were several of the new models, notably the new Chalmers-Detroit and the Model O Apperson. The Knox people had a brace of their 1909 speedsters, a big and a little one, and the latter excelled its mate.

Apperson in "Big Dick"

Knox Star Climber

Salzman-Thomas Flying

Hoffman's Pierce Six

Greiner - Chalmers-Detroit

Brush Single Cylinder

Probably at not another climb in the country has such a brilliant field of drivers assembled. Leland, the star of the day, declared it to be the toughest proposition he had yet been asked to face, and for a time it looked as if the doughty chap from Cleveland would have his colors lowered by George Salzman in the Thomas Flyer. As it was, Salzman was beaten for the Algonquin cup by only three-fifths of a second, certainly a very close margin.

One man nearly spoiled the climb by his poor driving—C. D. Paxson, who had the wheel of a Jackson in Class D. In the morning on Perry hill Paxson showed fast work, but that he did not kill the timing corps was a miracle. He apparently lost control of his car on the last turn and shot to the left-hand side of the road at the top, cutting in between the timers' tent and the poles that held the timing apparatus. The only damage done, though, was the smashing of a megaphone and the scare given F. H. Trego, "Biek" Edwards, and several others on the tape. Instead of barring Paxson from the afternoon effort, the officials let him drive, and as a result he ran amuck at the top of Phillips hill, dashing into the crowd after the bend had been passed and seriously injuring three of the spectators. Paxson himself escaped injury, as did his car as well.

There were five handicap events on the card, two free-for-alls and two events for amateurs. The amateur field had dwindled from last May, though, and Arthur W. Greiner in the Thomas-Detroit had walkovers in both the handicap and the free-for-all. Fifty-two cars had entered, but there were several scratches. There were actually thirty-five cars in the competitions.

Six motor buggies were the first to line up, and of

these the Holsman excelled under the formula, winning first and second places in its particular class.

The Brush single-cylinder tackled a big proposition when it ran with the Buick, Chalmers-Detroit, Jackson and Moline, but it held its own, and under the formula was a winner.

The Model O Apperson, the most recent addition to the Kokomo family, more than made good. It not only won its class, but its handicap percentage was the best of all the cars that competed in the climb. In this line of doping, the Brush was second, the Corbin third, and the Buick runabout fourth.

The Thomas Flyer, Apperson Jackrabbit, and Pierce Arrow had a three-handed battle in Class E, the last of the handicap events, but for the third consecutive year the Pierce won its class laurels and was a most consistent performer.

Then came the two free-for-alls, and with it a pretty fight for the Algonquin cup. The Stearns six, Thomas Flyer, Apperson "Big Dick," the big Knox, and the Stearns four fought it out, and Leland won the class and the trophy, establishing a mark of :29 2-5 for Phillips hill, while the Thomas Flyer did :30.

The Apperson Jackrabbit and the little Knox won the time honors at Perry hill, there being a tie at :24 1-5. The previous mark was :25 3-5, made by Sulzberger in the Stearns last May, although this did not stand, the motor club calling off all performances made at the time. The Phillips hill best was :35 2-5, made last year, although this course was about 100 feet shorter.

WHITE WINS SALT LAKE FREE-FOR-ALL.

Salt Lake City, Utah, Aug. 10.—The Salt Lake City Automobile Club held a successful hill-climb last Saturday on Federal Heights. Fast times were made, and several second [illegible]d

Stripped White Steamer Winning Free-for-All.

off last year's records in all classes. A parade was formed in front of the clubhouse to drive out to the course, and the long line of machines which answered the call bore witness to the growing popularity of the sport. There were nine events, with well-filled entry lists. Jackson, Stoddard-Dayton and Stearns carried off many honors, H. Bracken on the first-named getting first in the $1,500 and $2,000 classes and second in the two $3,000 classes for stripped and fully equipped cars. Stoddard scored first in the $3,000 and $5,000 stripped classes, and Stearns in the $5,000 fully equipped. J. F. Dunn's White won the free-for-all, the only event for which it was eligible, in the excellent time of 1:40. A summary of the free-for-all follows:

Car.	Owner.	Driver.	Time.
White Steamer	J. F. Dunn	F. A. Dundee	1:40
Stearns Six	A. Savage	A. Savage	1:43
Stoddard-Dayton	Sharman Auto Co	C. Selfert	1:47 1-5
Pierce-Arrow	Samuel Newhouse	Bert Fuller	1:48 2-5
Stearns Four	H. B. Lamb	Bert Angel	2:13 4-5
Studebaker	Studebaker Bros.	S. O. Reid	2:24

Prince Henry of Prussia is very content with the proposal to wind up next year's race in South Germany and to hold the speed trial on the flat in Forstenried Park, near Munich. It is quite likely that Austrian territory will be taken in as well.

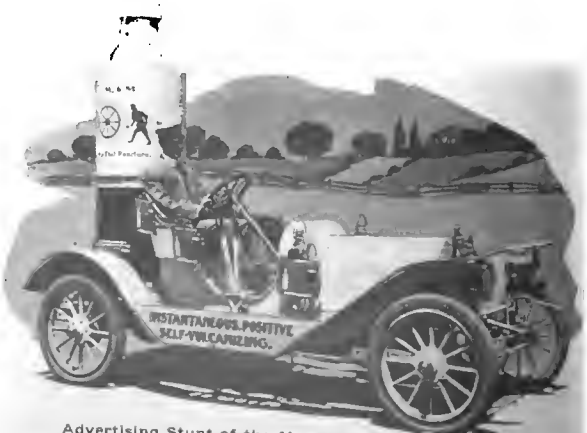
BUSY DAYS WITH CHALMERS-DETROIT.

Detroit, Aug. 17.—In the Chalmers-Detroit factory the production of 1909 cars is now going forward rapidly. Just at present, the manufacturing departments of the company are concentrating their attention on the Chalmers "30." Salesmanager Counselman reports that he has contracted for 2,802 cars already, 80 per cent. of them 30's. The various departments have been entirely rearranged to secure the greatest convenience in bringing together the parts. The final assembling room, a picture of which is shown above, is 200 feet long and has facilities for the setting up of 50 cars at a time. One of the new 30's is now engaged on an endurance test which should certainly demonstrate the reliability of the car. The plan is to run it two hundred miles a day for one hundred days. The course is from Detroit to Pontiac, Mich., 26 miles each way.

Busy Scene in Chalmers-Detroit Assembling Room.

A COMPETITION FOR TIRE INFLATORS.

Paris, Aug. 12.—A competition for mechanically operated tire inflators will be one of the features of the next Paris show to be held in the Grand Palais during November and December. The idea was put forth last year, but owing to the small number of entries had to be postponed. Any type of apparatus is eligible to compete provided it does not use compressed air prepared in advance. The basis on which the awards will be made is security and strength of the apparatus, 12 points; ease of adoption to automobiles, 8 points; ease with which the apparatus can be used, 12 points; weight and space occupied, 6 points; ease of attachment and dismounting and care of the apparatus, 4 points; selling price, 6 points; rapidity with which tires can be inflated, 12 points; the use of atmospheric air and conditions of its use, 12 points.



Advertising Stunt of the M. and M. Mfg. Co., Akron, O.
This Car, with the Giant Bottle of M. and M. Tire Solution on the Rumble, Has Been Touring Through Michigan, Ohio and New York.

Acting Mayor McGowan Welcomes the Thomas Round-the-World Winner at the New York City Hall.

HOME-COMING OF THE ROUND-THE-WORLD WINNER

Two days of well-sustained and enthusiastic greeting signaled the home-coming of the Thomas car, victor in the Paris to New York race, and its crew. On their arrival by the *Lorraine* on Saturday morning, at the French line pier close to two score enthusiasts of prominence in the automobile world were gathered to greet them. They included representatives of the national body, the trade associations, and the local club. Harry S. Houpt and John E. Bowles, of the Harry S. Houpt Company, the entrant of the car; E. R. Thomas, of Buffalo, its maker; F. V. Faurote, of the Thomas factory staff, and Montague Roberts, who piloted it as far as Cheyenne, were the "home folks" on hand. Two of the competing cars in the race were also represented—the Zust, by Walter F. Sykes and A. G. Pisani, of the American company, and the Protos, by Paul Funke. Max Paroutoud, American correspondent of *Le Matin*, one of the promoters of the race, was also on hand.

An octette of cars was on hand to carry the crew and the greeting band to the Automobile Club of America. Into them the guests of honor—George Schuster, driver of the car; George Miller, the mechanic, and George MacAdam, who made the run with them from Seattle as correspondent of the New York *Times*—were placed. The caravan then paraded up Broadway by way of the Wall street district to the Automobile Club of America, where lunch was served and congratulatory speeches made.

E. R. Thomas spoke in appreciation of the services of Schuster, Miller and MacAdam in the race, and the splendid work done by Roberts, Mathewson, and Brinker in this country. He said that the victory of the American flag was more to him than the victory of the Thomas car. He then announced the intention to enter the car in the 24-hour race.

Harry S. Houpt and John E. Bowles spoke for the Houpt Company, which was responsible for the entry of the car. Paul Funke, the Protos car designer, declared the Thomas well merited the victory, and that if the Germans had understood the circumstances there would have been no protest ever made against awarding it full honors. Walter E. Sykes, on behalf of the Zust car which competed in the race, and made a splendid showing in America, paid graceful tribute to the car and crew.

It was announced at the luncheon that the Thomas car was not only the winner of the New York to Paris race, but was likely to be awarded the prize offered by the Grand Duke Vladimir for the first car to reach St. Petersburg. It has been con-

Acting Mayor McGowan Takes the Wheel of the Thomas Round-the-World Winner in City Hall Park.
To the right are to be seen Harry S. Houpt, with E. R. Thomas alongside. Next is Reporter MacAdams, of the New York "Times." Then Montague Roberts. New York's temporary Chief Executive is at the wheel, with Schuster in the other front seat, and Mechanic Miller standing alongside.

Hoisting the Winner from the Ship's Hold.

ceded that this trophy would go to the Protos, which actually arrived in St. Petersburg first, but when the American crew was there it was said that the trophy was not for the first car to reach there from Vladivostok, but for the first car from New York to St. Petersburg, and that the trophy would be awarded by the Russian Automobile Club in accordance with the decision of the Race Committee on the main prize. The Thomas car won, as well, the cup given by the New York *Times* for the first car to reach San Francisco.

George Schuster and Montague Roberts jointly win the $1,000 prize offered by Jefferson deMont Thompson, chairman of the A. A. A. Racing Board, to the driver who should carry the American flag first to Paris around the world. Chairman Thompson's making good his offer was sportsmanlike in the extreme and more than generous, in view of the fact that when it was made the schedule of the race called for a run through Alaska, an undertaking that the Thomas car, on its arrival in Alaska, found impossible to carry out, though of all the contestants it was the only one to make the attempt.

The uncrating of the victorious car on Monday was made the occasion of another celebration. Including a motor truck, containing a band and the victorious car, bearing Schuster, Miller, MacAdams, and Roberts, and the escorting machines, there were 24 automobiles in line. The procession paraded through Broad and Wall streets to the City Hall, where the winning crew and Messrs. Thomas, Houpt, and Bowles were received and congratulated by Acting Mayor McGowan in his office. His honor pro tem. then came out and, seated at the wheel of the victor, good-naturedly posed for the camera corps. The procession then continued up Broadway and disbanded at the Houpt garage.

At the Automobile Club of America to-night Orrel A. Parker will deliver a lecture on the race, illustrated by lantern slides. Mr. Houpt is the host of the occasion.

Thomas Emerging from Its Wooden Overcoat.

EIGHTH OF COLUMN, AMERICAN ARRIVAL, PARIS

Paris, Aug. 10.—Germany is not yet at all reconciled to the loss of first position in the New York-Paris race, as is shown by an official protest sent to the *Matin* by the *Berliner Zeitung am Mittag*. Of course no attention can be paid to the protest, the Protos having been officially declared disqualified owing to its departure from the official route. If the Zust finishes, which is practically certain unless some unforeseen accident takes place, it will be given second position to the Thomas. All the glory the Protos can claim is in its record run from Vladivostok to Paris, where, owing to being newly fitted out and repaired, it was able to gain four days on the American car.

The feelings of France in the matter can be gauged by the fact that the *Matin* devoted an eighth of a column to the arrival of the Thomas in Paris, and other journals summarized the event in as many lines.

CAMERON A WINNER OF LIGHT CAR CHALLENGE.

Baltimore, Aug. 17.—As the result of the run-off of the challenge contests inaugurated by the local branch of the Ford company, the Cameron air-cooled car was the winner in two out of three, so that the cup was awarded to it without running the speed trials. The events were the result of a challenge issued by the Ford backers that they would be willing to match their cars against anything selling under $1,500, and the fiat was given due publicity through the daily papers late in July. The challenge

Flag Which Costs Chairman J. de M. Thompson $1,000.

was accepted by the representatives of the Cameron company, three contests being named, an economy run, a hill-climb and a speed test, the cars to be stock machines as per 1908 catalogues, the removal of the mudguards, bonnet and muffler being permitted. All other medium-powered cars were invited to compete, and the Overland was represented. In the economy test, the Cameron representatives insisted that lubricating oil consumption should also figure as a basis for the award, but this was not agreed to by the other contestants. The course was a 65-mile run over as bad roads as Maryland or any other State affords. The results were: Cameron, 1 7-8 gallons gasoline, 1 pint lubricating oil; Ford, 2 5-8 gallons gasoline; Overland, 3 5-8 gallons gasoline, the oil consumption not being stated by the others.

The climb was held on a hill measuring about 7-8-mile, with a grade averaging from 8 to 22 per cent. and with one or two very bad turns. This the Cameron won in 1:35 1-5, the Ford's time being 1:40 1-5 and the Overland, 1:55. As the winning of the two events in succession made it "two out of three straight" for the Cameron, it was decided to abandon the speed trials, much to the disappointment of the backers of the latter, who were confident of scoring another victory. The winning Cameron was a standard stock model with a 3 5-8 by 3 1-2-inch motor and the same gear-set and gear ratio as ordinarily employed. The car made the run over the road from Beverly, Mass., to Baltimore, and was entered without change.

CLUBS THAT ARE AIDING AUTOING'S PROGRESS

ADMIRABLE PLAN OF PHILADELPHIA CLUBS.

PHILADELPHIA, Aug. 17.—Following upon the meeting several weeks ago, in the quarters of the Automobile Club of Germantown, to discuss the formation of an alliance of local and nearby clubs for offensive and defensive purposes, a committee was named last week to bring about uniform action when matters of interest to all come up for consideration. The committee, which consists of one representative from each club, is made up as follows: C. H. Wheeler, chairman, Automobile Club of Germantown; Stedman Bent, Automobile Club of Philadelphia; Edwin S. Nyce, Norristown Automobile Club; John B. Bird, Delaware Automobile Association; A. H. Tomlinson, Delaware County (Pa.) Automobile Club; G. Douglass Bartlett, Quaker City Motor Club, and S. Boyer Davis, secretary and treasurer, Automobile Club of Philadelphia.

The name decided upon for the new body is the "Committee of Allied Interests of the Automobile Clubs of Philadelphia and Vicinity," and among the objects it hopes to accomplish are the preparation of road maps and route information; the erection of warning and direction signs; the repair of roads, if essential, and where it can be effected only by the automobilists themselves; the compilation of touring information, not only in regard to roads, but as to accommodations, garages, repair shops, and stations, and where gasoline and oil may be purchased, and the care of local legislation (city and township ordinances).

In the past all of the clubs represented have done more or less work, in a desultory fashion, along the lines represented above, and it was pointed out at the preliminary meeting how much more effectively—and economically—this work could be done if all hands would combine. When a matter of vital interest to motorists of this vicinity confronts the clubs in the future, there will be no separate meetings of the clubs, the naming of separate committees, and the incurring of expenditures, which, in the aggregate, would amount to quite a respectable total. Instead, the matter will be turned over to the Committee of Allied Interests, which has full power to act.

The majority of the committee are lawyers, and, in the event of the necessity for quick action in matters affecting legislation, this is a decided advantage. In such work as the signhoarding of the roads, and the erection of warning notices, the saving that will be effected in the future through the impossibility of duplication will in itself be considerable.

The new committee will get to work at once and outline a system of procedure. Meetings will be held upon the call of the chairman, and with the advantage of compactness quick results may be looked for when it tackles any proposition.

MINNEAPOLIS CLUB'S INCREASING MEMBERSHIP.

MINNEAPOLIS, MINN., Aug. 17.—The Minneapolis Automobile Club, which now ranks among the foremost in the country in membership and activity, has decided upon another campaign for members. The opening of the new country clubhouse, 16 miles from the city, is the motive for the new activity, and the principal inducement offered is the remission of the initiation fee. There has been a rush of autoists to the club rolls, and it now numbers over 700 of the 1,900 automobile owners in the city. A hill-climbing contest is announced for August 29, and entries are rapidly coming in. The new rules of the A. A. A. will be used.

A PLAN TO EDUCATE THE FARMERS.

BEAVER FALLS, PA., Aug. 17.—The Beaver Valley Motor Club will give the farmers a tour over the surrounding country in automobiles on farmers' day during Old Home Week. The idea is to demonstrate to the farmers the importance of good roads and to overcome their prejudice against automobiles.

LONG ISLAND CLUB IS GAINING STEADILY.

BROOKLYN, N. Y., Aug. 17.—The annual handbook of the Long Island Automobile Club for 1908 has just been issued, and comprises an attractive little volume bound in green linen-covered boards with the name of the club stamped in gold. The frontispiece is ornamented with a half-tone plate giving portraits of President Charles Jerome Edwards, Vice-president Dr. C. B. Barker, Treasurer Louis T. Weiss, and Secretary Russell A. Field, in addition to photographs of the city headquarters and garage at 360 to 366 Cumberland street, Brooklyn, and the country home at Bay Shore, Long Island. Heading the membership list, which follows the constitution and by-laws of the club, are the names of President Roosevelt, Timothy L. Woodruff, and William J. Youngs, as honorary members. The club was incorporated November 27, 1900, and a feature to be noted in glancing through the membership list of the 1908 year book is the number of founder members who are still actively engaged in forwarding the interests of the organization. These include Louis R. Adams, A. R. Pardington, and Frank G. Webb. Another prominent member is William K. Vanderbilt, Jr., he having joined November 11, 1901.

The club may well be proud of its progress during the eight years of its existence, as represented by this latest issue of its year book. The membership is nearing the 500 mark.

MANY ENTRIES FOR BOSTON'S ENDURANCE RUN.

BOSTON, Aug. 17.—Rules and entry blanks for the twenty-four-hour endurance run which is to be conducted by the Bay State Automobile Association, September 23, were issued to-day. The run will cover a distance of approximately 275 miles, the route being from Boston to the White Mountains and return, the outward trip being along the north shore through Newburyport, Portsmouth, Rochester, North Conway and the Crawford Notch to Bretton Woods, and the return trip being through Bethlehem and the Merrimac Valley. Motors must be kept running, with the exception of a two-hour stop at Bretton Woods, and a one-hour stop at another point for luncheon.

In drafting the rules for this contest the committee has kept in mind that it is intended to be a thorough test of the reliability of the cars rather than a test of the endurance of the drivers. As it is a test of cars only, the rules permit the carrying of spare drivers and changes may be made at any of the controls upon notice to the checker. There will be three controls each way outside Boston and Bretton Woods, so the trip will not be arduous on the pilots. Another excellent feature of the rules is the requirement that the observers shall all be practical operators, acceptable to the committee. This is to insure a complete and careful record of the actual performance of each car. The test will start at 10 A.M., September 23, and is expected to finish early in the afternoon of the following day. If there is one positive winner a silver cup will be awarded; if there is a tie all perfect score cards will be given certificates. The driver making the most consistent performance will be awarded a gold watch.

During the daytime a pilot car will mark the route with confetti; at night the pilot car will carry a red searchlight on the rear and will precede the leading competing car by two minutes. There are to be two classes—A, for touring cars, and B, for runabouts, roadsters and tourabouts. Enough entries have been assured to make it evident that at least 50 cars will participate.

POPULAR SUBSCRIPTION FOR JERSEY LAW TEST.

NEWARK, N. J., Aug. 17.—Having retained the Hon. John W. Griggs, ex-governor of New Jersey and ex-attorney general under President McKinley, and Charles Thaddeus Terry, as counsel to fight the constitutionality of the obnoxious Freylinghuysen law, it has been decided by the joint committee of the

Associated Automobile Clubs of New Jersey and the New Jersey Automobile Trade Association, to make the matter a popular movement by giving Jersey autoists generally an opportunity to register a protest against such unreasonable and unfair treatment by subscribing to the fund for the payment of attorneys' fees and the costs of testing the constitutionality of the law. Subscriptions will be received by any of the committee, or by the treasurer, R. A. Greene, 90 Washington street, Newark, N. J. The committee consists of the following: W. C. Crosby, J. H. Edwards, G. F. Blakeslee, R. A. Greene, George Paddock, A. H. Darnell, George A. Post, Joseph H. Wood, secretary.

CLEVELAND CLUB TO HOLD A RELIABILITY RUN.

CLEVELAND, Aug. 17.—After considerable urging on the part of dealers in this city, the Cleveland Automobile Club has consented to act as the sponsor of a reliability run, to be held some time during September or the first part of October. The representatives of such cars as the Pierce-Arrow, Stoddard-Dayton, Knox, Chalmers-Detroit, Gaeth, Regal, Cartercar and others have promised at least one entry each, and are enthusiastic over the project. A few years ago, Cleveland was a center of automobile events of all kinds, and now it is coming to life again.

WORCESTER CLUB HAS NEW SECRETARY.

WORCESTER, MASS., Aug. 17.—Herbert M. Sawyer, until recently secretary of the Board of Trade, has been notified of his election to the office of secretary of the Worcester Automobile Club. He will enter upon the duties of his new position this week. Mr. Sawyer will also be made a director of the club, in order that he may represent it at legislative hearings and meetings of State clubs and associations. In the past most of this work fell upon John P. Coughlin, president of the club.

NEW JERSEY CLUB IS OILING ROADS.

TRENTON, N. J., Aug. 17.—The Mercer County Automobile Club is furnishing and applying oil to some of the country roads, as an experiment in abating the dust nuisance. It is hoped that this method will be adopted by the State in all road construction. This will also preserve the farmers' crops from injury by the dust which settles, and incidentally blinds the automobilist who is in the wake of another car. This example should be followed by other automobile clubs, as it helps to secure better legislation.

OILING ROADS IN COUNCIL BLUFFS, IA.

COUNCIL BLUFFS, IA., Aug. 17.—At a meeting of the recently organized automobile club of this city it was decided to make the experiment of oiling McPherson avenue from the Chicago, Milwaukee & St. Paul tracks to the paving on East Pierce street. The cost is estimated at $150.

HARTFORD CLUB'S PROTEST BRINGS RESULTS.

HARTFORD, CONN., Aug. 17.—As the result of the constant and bitter complaint that has been made for some time past by prominent members of the Automobile Club of Hartford, the notorious "hen-coop bridge" stretch is to receive attention, and others that are in the same class with it will be repaired. The Highway Commissioner has been stirred to action, and the bad spots will be taken in hand at once.

FORTY ENTRIES FOR BRITISH FOUR-INCH RACE.

LONDON, Aug. 12.—Total entries for the British Four-Inch Race, the limited bore event to be held on the Isle of Man, Thursday, September 24, stand at 40, five additional cars having been put in at double fees. The late comers are two S. C. A. T., a Vinot, a Piccard, and a Rover. The course on which the race is to be held is about 38 miles round; having to be covered nine times the exact total distance is 350 miles. A large portion of the old Tourist Trophy route has been selected.

REMARKABLE ECONOMY DEMONSTRATED.

HARRISBURG, PA., Aug. 17.—The first economy test of the Motor Club of Harrisburg, held last Saturday, brought forth some splendid records, a single-cylinder Cadillac, a 1903 model, being used as a grocerman's delivery wagon, securing a mileage of 38 1-2 miles on the gallon of gasoline allotted to each contestant in the test. Andrew Redmond, driving a Columbus electric in the electric class, covered the remarkable distance of 140 miles on a single charge, requiring twelve hours for making the run, as the cars most economical speed was 12 miles.

The contest was held over a four-mile course laid out on the paved streets of the city, and attracted more attention than any other contest ever held in Central Pennsylvania. Splendid scores were made in all the classes, the only requirements being that the cars should carry capacity of passengers and travel around the course until the gallon of gasoline had given out. This contest will be followed by a road test of 100 miles in September. There were eight classes, and the results were as follows:

CLASS NO. 1—SINGLE-CYLINDER CARS.

1.	Cadillac	Harrisburg Auto Co	23.9
2.	Reo	George W. Myers	38.5

CLASS NO 2—TWO-CYLINDER RUNABOUTS.

1.	Jackson	Motor Vehicle Co	31.6
2.	Maxwell	John Sellers	31.3
3.	Ford	C. L. Scott	26.5

CLASS NO. 3—TWO-CYLINDER TOURING CARS.

1.	Maxwell	Andrew Redmond	33.2
2.	Jackson	Motor Vehicle Co	30.2
3.	Maxwell	F. H. Baumgardner	18.3

CLASS NO. 4—FOUR-CYLINDER RUNABOUTS UNDER $1,000.

1.	Buick	Central Pennsylvania Auto Co	28.6
2.	Ford	Harrisburg Auto Co	22.4

CLASS NO. 5—FOUR-CYLINDER RUNABOUTS, $1,000 TO $2,000.

1.	Franklin	Paul Messner	32.6
2.	Pullman	Robert Morton	24.2

CLASS NO. 6—FOUR-CYLINDER TOURING CARS UNDER $2,000.

1.	Pullman	J. A. Kline	27.6
2.	Franklin	Frank Oenslager	21.5

NO. 7—FOUR-CYLINDER TOURING CARS, $2,000 OR OVER.

1.	Cadillac	C. C. Crispen	27.5
2.	Franklin	Central Pennsylvania Auto Co	17.5
3.	Pullman	W. F. Graupner	15.8
4.	Stoddard-Dayton	J. M. Jaycox	13.6

CLASS NO. 8—FOUR-CYLINDER RUNABOUTS, $2,000 OR OVER.

1.	Cleveland	G. L. Strayer	20.2
2.	Pullman	E. G. Irvin	19.0

CLASS NO. 9—(Exhibition Run on Single Charge.)

1.	Columbus Electric	Andrew Redmond	140.0

A WESTERN NEW YORK SPEED TRAP.

FREDONIA, N. Y., Aug. 17.—Practically the whole township of Portland, which is between Fredonia and Westfield, is interested these days in trapping the unsuspecting autoist. Portland is on the main road between Buffalo and Erie and is traveled by many automobilists, who in the future will do well to inquire at Fredonia when westward bound as to the operating of the Portland trap, and when coming eastward the same sort of inquiry should be made at Westfield. Rather than waste time in fighting the trap, the average autoist has contributed to the Portland town treasury, and continued his journey in a cussing frame of mind.

WHITES CARRY PORTO RICO PASSENGERS.

Charles H. Martin, who several years ago established a line of Knox 'buses between Ponce and San Juan, is back in Porto Rico. He has been there a month engaged in re-establishing an automobile passenger line between these two points. This time he is acting as agent for the New York branch of the White Company. Already enough White steamers have been installed to insure a daily trip each way. Touring cars only are used, as only passenger traffic is sought. Mr. Martin is engaged in the formation of a local motor transportation company between the points named.

A. A. A ISSUES GENERAL WARNING AGAINST RECKLESS DRIVING

NEW YORK, Aug. 15.—The American Automobile Association has sent a hurried notice to its 20,000 odd members, scattered throughout the country, to the effect that drastic anti-automobile legislation will be enacted in several of the eastern States, and particularly Connecticut and New York, at the coming sessions, if reckless speeding is not stopped. This action grows out of the request made by Secretary G. K. Dustin, of the Automobile Club of Hartford, that visiting autoists respect the law of Connecticut, as otherwise it would be repealed, as well as out of attitude of the authorities of Nassau county, Long Island, who are determined to suppress reckless driving to the common danger. The Association has always condemned speeding, and the attitude of President W. H. Hotchkiss, and Charles T. Terry, of the Legislative Board, has been made public on numerous occasions during the past year.

On Wednesrday last, Mr. Terry and Secretary Elliott attended a hearing before the supervisors of Nassau county, who have announced that they will send all speeders to jail, unless the A. A. A. and its affiliated clubs can bring about the necessary reform by moral suasion. The Long Island Automobile Club was represented by F. G. Webb, chairman of the club's committee on public safety; W. P. Richardson, L. T. Weiss, Russell A. Field and C. C. Cluff, while the Vanderbilt cup commission was represented by Chairman Jefferson de Mont Thompson and A. R. Pardington. The representatives of the different automobile bodies prescnt were all thoroughly in accord with the attitude of the Nassau county supervisors, which reflects, in a large measure, that of local authorities all over the country. Halstead Scudder, counsel to the board, stated that he had been authorized by the supervisors to notify the representatives of all automobile bodies that speeding must stop at once, or the most cxtreme measures permitted by the law will be enforced. Mr. Scudder has been collecting statistics of the fatalities on Long Island due to speeding, and divides them into murder, homicide, suicide and assault with intent to kill, classifying the autoist who drives a machine without respect to the rights of other vehicles at crossings as a plain outlaw, bent upon murdering some other user of the highway, or on committing suicide.

In its warning, the American Automobile Association states that it is the duty of every one of its members to heed it personally, as if the present undercurrent of feeling is allowed to grow and spread, it will result in the enactment of laws in the different States, of so radical and violent a character, that it will be impossible for the Association to ever secure the passage of a Uniform State motor vehicle measure, or a Federal Automobile bill, for which it is now putting forth every effort.

Two White Steamer Ambulances Which Have Been Built for the U. S. Navy.

AUTO TRANSPORTS ONLY IN FRENCH ARMY MANEUVERS

PARIS, Aug. 12.—For a period of fourteen days over 100,000 men will be dependent on the automobile for food and drink, the French army authorities having decided to use mechanical means of transport exclusively in the next maneuvers to be held in the neighborhood of Blois, Tours, and Chateroux. A total of eighty vehicles are required to carry victuals to the 4th, 5th, 8th and 9th army corps which will be in the field. As the army does not possess this number of vehicles, an appeal has been made to manufacturers to meet the deficiency by the loan of automobile trucks and drivers.

Although the pecuniary advantage is but slight, there is little doubt but that the eighty trucks will be supplied by French manufacturers, and that the horses of the army service corps will be left without work during the military operations. The indemnity to manufacturers is at the rate of 20 cents per horsepower per day, fuel, oil and grease being provided by the army. Drivers are allowed a special indemnity of 50 cents per day, which is really handsome treatment compared with the one of five cents received by the privates in line regiments. In practically every case the men having charge of the military automobiles will be workmcn of the firm engaging their vehicle, who are liable for service as reservists in the standing army. Special facilities are allowed by which men who would normally have to pass 15 or 28 days in some other branch of the army are allowed to fulfil their military duties at the wheel of one of their employer's army service wagons.

The usual method of procedure during the maneuvers is for the automobiles to be divided up into groups according to their power and speed, a certain number being allotted to each army corps. Every morning at daybreak the automobile convoy, under the charge of an officer who regulates the speed and sets the line of march, starts out for the camp which it is required to furnish with provisions, and water if necessary. The average distance from the base to the fighting line is from 30 to 35 miles. It is not always over the main roads, for as the troops move away from the centers of civilization the wagons have to follow them. Usually by noon the loads have been discharged, and after lunch at the camp or on the roadside the convoy sets out empty for the army base. If there is any necessity for it, the sick men of the troops are carried back to the headquarters.

Navajo Indians Up-to-Date Transported.

This party of Navajo Indians in the Studebaker Truck Was Photographed During the Meeting of the National Education Association in Cleveland. They Seem to Be Enjoying Themselves.

Brush Runabout in Columbus Circle, New York.

Car No. 1, of the five single-cylinder Brush Runabouts and Delivery Wagons Which Left Detroit Recently for Various Parts of the Country, Arrived in New York in Good Condition and Continued on Its Way to Boston.

Strenuous Hill-Climb Test for Ramblers.

All Rambler Cars Before Leaving the Factory Must Prove Their Hill-Climbing Ability on This Inclined Track, with Grades of 20, 30 and 40 per cent.

CANADIAN ARMY WILL HAVE AUTO CORPS.

MONTREAL, Aug. 10.—The experience of the Canadian Army Service Corps with automobile transportation at Quebec's recent tercentenary celebration will probably result in the establishment of an automobile corps like that in England. Colonel Biggar, the chief of the Service Corps, will go to England on special leave to study the system in force there. It is proposed that all automobiles and traction engines in use in Canada be registered at Ottawa for this purpose.

RACE MEET TO BE HELD AT MONTREAL.

MONTREAL, Aug. 10.—R. M. Jaffray, acting for the Automobile Club of Canada, is promoting a three-day race meet and gymkhana, to be held in Montreal August 28, 29, and 30. The fast and well-banked track at Delormier Park has been secured and a large number of entries are assured.

"Great Western" Tackling a Tough Climb.

The Testing Track of the Model Automobile Company Seems to Run through a Washed-Out River Bottom. This Is Only a Part of the Test Given All of This Company's Cars.

DEFY N. A. A. M., A. M. C. M. A., AND A. A. A.

The Motor Racing Association, a New York organization, made up of four importers, two makers, and two local agents, first organized as the Metropolitan Motor Association, has decided to run its two-days' meet at the Brighton Beach track on Friday and Saturday, September 18 and 19.

At the meeting last Friday night, at which the dates were fixed, it was decided to ask for no sanction from the race governing body. The reasons for this action are stated in the official announcement of the proceedings to be: "In order to obviate the necessity of taking sides in the existing controversy between the A. A. A. and the A. C. A., it was decided to hold the meet without asking for the sanction or approval of any organization." This is in opposition to the policy of supporting the national body, formally decided upon by the N. A. A. M. and the A. M. C. M. A., representing the American trade.

Carter-car Automobile Stage Which Daily Climbs Mount Hamilton.

Climbing Mount Hamilton.—To the thousands of tourists who visit California every year one of the most interesting side trips is that up Mount Hamilton to the world-famous Lick Observatory. Heretofore this has always meant a long and tedious journey, as a stage coach was the usual means of ascending the mountain, and many have grown discouraged and abandoned the trip when they discovered this. Such was the state of affairs when John H. McGehee, of Lechter's Garage, San José, was struck by the idea that an automobile stage would be an improvement. After considerable investigation he decided to purchase a friction-driven Carter-car for the purpose. The photograph shows the car at its daily work. The road has an elevation of 2,100 feet in a distance of seven miles. Although the picture was taken in July, it shows the ground and shrubbery covered with snow.

Another Packard Stunt.—Still looking for new worlds to conquer, the Packard Motor Car Company has established another testing route on the old State Road between Philadelphia and Pittsburg. Automobilists who have toured in all parts of the country agree that no known route affords finer scenery, with every kind of going, good, bad and indifferent, than this. The Packard camp is located at McConnellsburg, and a number of cars of different types are at present undergoing speed and endurance trials there. In charge of operations are H. B. Joy, the general manager; S. D. Waldron, assistant general manager, and M. J. Budlong and E. M. Moriarity, representatives in New York and Kansas City, respectively.

Carriage Builders Take Up Autos.—The C. T. McCue Company, Hartford, Conn., which has been prominent in the manufacture of running gears for horse-drawn vehicles for a number of years, has decided to take up the building of automobiles. It is understood that most of the parts for the new car, which is to be known as the McCue-Hartford, are to be supplied by the Billings & Spencer Company, F. C. Billings, of the latter firm, also being vice-president of the McCue Company, and that the latter will merely assemble. The new car is an attractive looking machine, and it is understood that an initial order for thirty like it has already been received from the South.

Logan Reorganization.—B. A. Gramm and Fred Bisantz, formerly engineer and superintendent, respectively, of the Logan Construction Company, Chillicothe, O., which recently failed, have organized the Gramm-Logan Motor Car Company, which will be located in the northern part of Ohio. The plant has already been erected, and announcements will soon be made.

Tires in the East Indies.—The experts of the Netherlands Rubber Company, of Singapore, Straits Settlements, who have been investigating the various makes of tires upon the market, have finally decided to adopt the Swinehart. This Akron, O., company claims that fully 90 per cent. of the solid tires for automobiles made in the world are made under its patents.

Winton Prize Contest.—The second annual $2,500 prize contest for Winton Six Chauffeurs will start November 1, 1908, and end June 30, 1909. Any employed driver of a Winton Six, whether of the 1908 or the 1909 model, is eligible to compete. The contest follows the same plan as the last one, the results of which were announced recently.

Premier Home Again.—The "100 Miles for 100 Days" Premier, which acted as press car with the Glidden Tour, has returned to Indiana, and is now making a tour of the cities near Indianapolis. The car has already covered three-quarters of the intended distance. It is still using one of the original set of Fisk clincher tires.

Postal to Be Built in Cincinnati.—The Postal Auto & Engine Company, of which Clarence E. Runey is president, and which builds the Postal buggy type of car, is now removing its plant to Cincinnati. New models for the season of 1909, consisting of several additions to the Postal line, will shortly make their appearance.

Logan Company Fails.—The Logan Construction Company, of Chillicothe, O., which is engaged in the manufacture of automobiles and auto-trucks, has filed a petition in bankruptcy, with assets of $69,000 and liabilities of $120,000.

Waukesha Company Enlarges.—The Waukesha Motor Company, of Waukesha, Wis., are completing designs for a new building to be erected in Waukesha, which will triple their present capacity.

IN AND ABOUT THE AGENCIES.

Atlas.—The Atlas Motor Car Company, of Springfield, Mass., has discontinued its agency in New York, and has established a branch house at 1876 Broadway, under the management of E. H. Sherwood, formerly with the Aerocar.

Autocar.—Beginning September 1, the Autocar, formerly represented in Philadelphia by the General Motor Car Company as agents, will be exploited in the Quaker City through the medium of a branch.

Peerless.—The Peerless agency in Boston is preparing to enlarge their salesrooms by taking over the adjoining store, which was previously occupied by the Diamond Rubber Company.

Panhard Oil.—The G. A. Haws Company announces the appointment of the Beckley-Ralston Company, 80 Michigan avenue, Chicago, as Chicago distributors for Panhard oil.

Cadillac.—The Lubeck Automobile Company, of Grand Rapids, Mich., has taken over the agency for the Cadillac, formerly sold in that city by C. J. Bronson.

Lozier.—On September 1 the General Motor Car Company, agents for the Lozier in Philadelphia, will remove to the new building at 227-229 North Broad street.

Havoline Oil.—T. E. Hamilton has opened a salesroom on Boylston street, Boston, Mass., and will handle Havoline oils exclusively.

PERSONAL TRADE MENTION.

James E. Murray, secretary of the New York Sporting Goods Company, 17 Warren street, New York, has returned from a two-months' vacation in New Hampshire. He will be pleased to have manufacturers of accessories send 1909 quotations for the company's new catalog.

Robert Morton, who has been acting as head inspector and tester for the Pullman Company, of York, Pa., will in the future be attached to the staff of the Keystone Motor Car Company, and will look after the Pullman interests in Harrisburg.

F. A. Babcock, Jr., has succeeded C. M. Atterbury as manager of the Chicago branch of the Babcock Electric Carriage Company, 1330 Michigan avenue. Mr. Babcock has started on a tour of inspection of the various agencies in his district, covering the whole distance in a Babcock.

Alexander Winton received an unusual honor last Saturday at the hands of the Lakewood Yacht Club, of Cleveland, of which he is commodore. That day was set apart as "Commodore's Day," and was celebrated with a squadron sail, salutes, etc.

Percy Owen has joined the sales forces of Carl H. Page & Company, Broadway and Fiftieth street, who are agents for the Chalmers-Detroit line. He will also continue to handle the Bianchi.

E. B. Olmsted, for the past five years secretary and general manager of the Autocar Equipment Company, of Buffalo, N. Y., has resigned to accept the position of vice-president and general manager of the American Motor Truck Company.

Allan Miller, sales manager of the Reliable Dayton Motor Car Company, is making a three-weeks' trip to northern Illinois and Iowa in a Reliable Dayton Type F, taking in the Iowa State Fair at Des Moines.

H. P. Maxim, designer of the Maxim-Goodridge electric, is taking his vacation on an automobile trip through the New England States.

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THE AUTOMOBILE

How Wilbur Wright "Motored" at Le Mans

By W. T. Bradley

LE MANS, Aug. 20.—Wilbur Wright is the hero of the hour. His machine lies in the wooden shed on the Hunaudieres racecourse with one wing completely broken, and is not expected to be out again for a week, but even in his accident the American aeronaut has triumphed. It happened on Thursday morning last, after a more than usually brilliant flight that had caused Engineer Surcouf, of *Ville de Paris* fame, to exclaim: "Our machines are but children's toys."

On the previous days the crowd had been too big for Wilbur Wright's ideas of seclusion, and, instead of flying in the evening, the aeroplane was brought out of the shed which it shares with its pilot and placed on the wooden starting rail at 6 A. M. A few minutes after seven, all being ready, attachment was made to the catapult, the motor started, and the apparatus sent spinning through the air. For 8 min. 13 2-5 sec. it evolved over the ground, making big sweeps, cutting short to swing round as if on a pivot, flying over the tree tops at a height of 80 to 85 feet, then descending to twenty feet from the ground, to mount up again a moment later, all being done in a fresh northwest breeze that would have sorely troubled any other sky pilot.

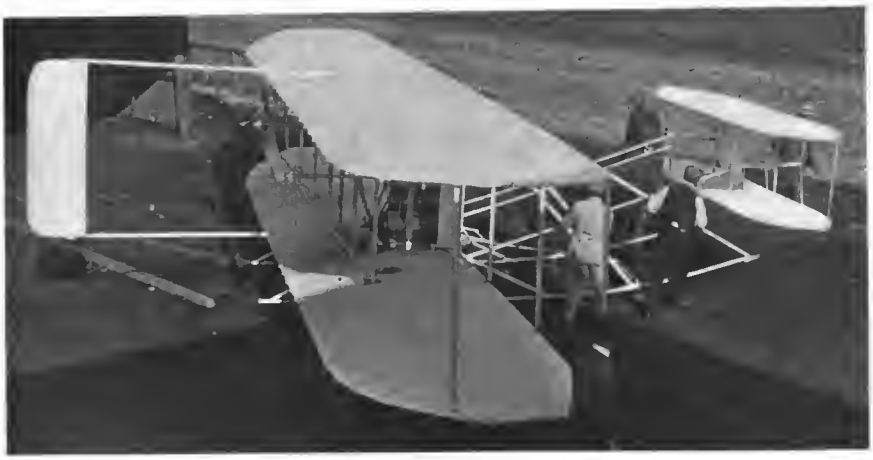
When he had had enough of it, the apparatus was brought nearer to earth, the engine cut out, and the artificial bird allowed to gracefully settle down on its wooden skates, the operation being performed with such gentleness that not a tremor was observable on the canvas frame. Half an hour later the apparatus was off again, but from the first it was noticed that the motor was missing. Nevertheless, Wilbur Wright mounted to a height of 90 feet, the highest altitude ever attained by a heavier-than-air machine in France, and appeared to be little troubled by the irregular firing of his engine. After remaining a minute in the air and describing a huge circle, the aeroplane was brought to about 30 feet from the ground, the engine cut out, and a gentle gliding movement downwards begun. Suddenly it was seen that the machine was heeling more than usual, the left wing touched the ground, there was a sound of breaking spars, and a second later the aeroplane had collapsed. As soon as Wilbur Wright had extricated himself from the wreckage, without a scratch to show for his fall, he explained that, seeing he was about to alight on a mound of earth, he had tried to change the direction of the machine, but owing to insufficient training pulled the lever the wrong way, with the result that the left wing struck the object he was trying to avoid. Since coming to France the controlling mechanism of the aeroplane has been changed, all operations now being performed by two levers only; when in the States there were four levers, two being operated by Wilbur and two by Orville Wright. It was owing to inexperience with this system that the accident happened.

Though the person most interested looked upon the false movement as a piece of stupidity, the public regarded the descent as a triumph, for by it Wilbur Wright had proved that the stoppage of the engine was not a source of danger, the operation of coming to earth having been performed with the ease and certainty of a powerful bird.

On the Wednesday morning, also about 7 o'clock, an excellent flight, lasting 6 min. 56 2-5 sec., was made in a fresh breeze, and at a height which at one moment reached 80 feet. Eight rounds were made of the racecourse at a speed averaging 35 miles an hour, the distance covered being about five miles. It was not a long-distance test, however, for the machine was changed in direction every minute or so, various figures being described to the astonishment of the spectators, none of whom had ever before seen such work in a 10-mile-an-hour breeze. On the evening of the same day two other attempts were made, but the first only lasted 40 seconds and the second 1 min. 45 sec. The wind was rather strong, and Wilbur Wright preferred not to take any risks, declaring that he could fly with ease if his brother were there to help him control the machine, but that the operation was difficult for one man.

Wright and Kapferer at Le Mans.

Tuesday's flight, executed late in the evening, consisted of three com-

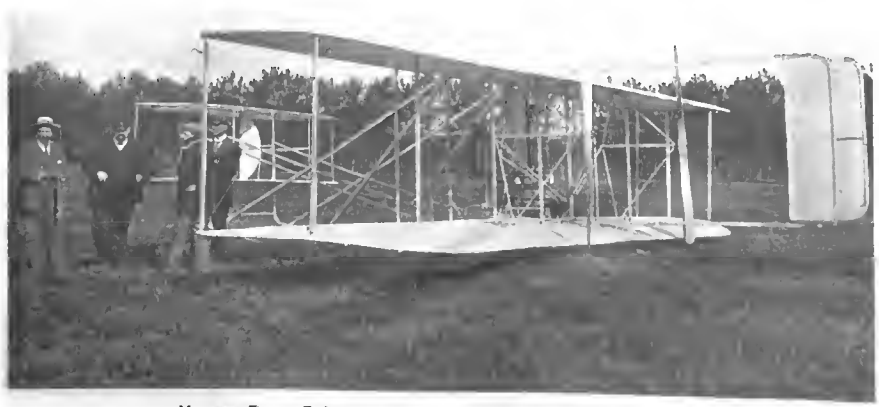


Bringing Aeroplane from Its Shed Before a Flight.

plete circles of the racecourse in 3 min. 43 sec., at a speed of 38 miles an hour. On Monday two successful flights were made, the first of 42 seconds, the second of 1 min. 41 sec. Though remarkably successful work has been done, these flights have been undertaken entirely with a view of familiarizing the operator with his machine and the ground, no attempt whatever being made to break records. This is shown by the progressive nature of the flights, which are as follows:

Saturday, August 8	1 minute, 45 seconds.
Monday, August 10	False start.
	42 seconds.
	1 minute, 41 seconds.
Tuesday, August 11	3 minutes, 43 seconds.
Wednesday, August 12	40 seconds.
	1 minute, 45 seconds.
	6 minutes, 56 2-5 seconds.
Thursday, August 13	8 minutes, 13 2-5 seconds.
	1 minute, height record of 90 feet, broke wing in descending.

So complete has been the triumph of Wilbur Wright that in French aeronautical circles there is only one opinion on the abilities of the man from Dayton. Such practical aeronauts as Delagrange, Surcouf, Kapferer, and Zens declare that the results are marvelous, far surpassing anything they ever thought possible. It must be remembered, too, that the majority of French aeronauts were firmly convinced that the Wright brothers were huge bluffers. The most astounding thing is that two men should, alone and unaided, have worked at such a problem and achieve success with the scanty means at their disposition. For the machine which has astounded the world is the exclusive work of Wilbur and Orville Wright; even the engine is the production of the brothers from Ohio.



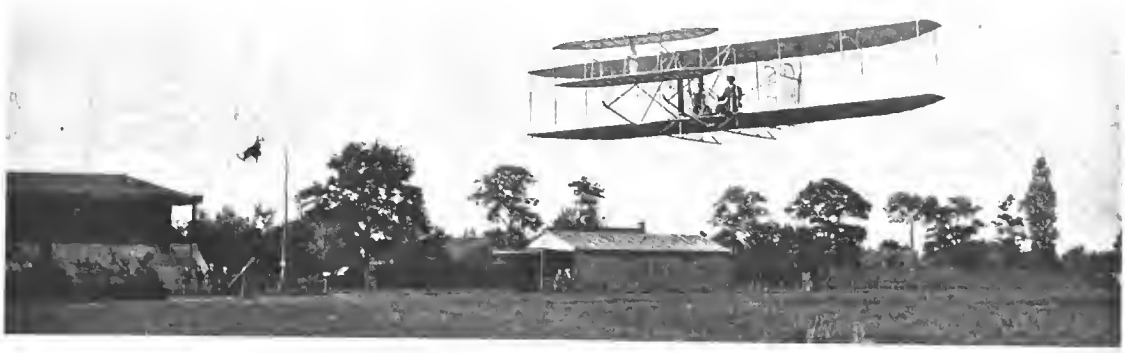
Messrs. Berg, Bollee, Kapferer and Wright Beside Aeroplane.

It is here that there is room for criticism, but even the criticism sounds strangely like praise. The motor and aeroplane have been built by the two brothers, and as it is practically impossible for any two men with rather limited means to show such results as the best factories, manned by experts in the different branches, there are things that the technical man can quibble at. The motor, declared one engineer, looks as if it had been made by a clever village locksmith. The framework is ingenious and strongly constructed for use, but it has not the fine finish of the French machines. The latter, however, fly with a certain hesitation, as if they had not yet got out of their swaddling clothes, while the Wright apparatus is a mechanical bird that has been bred to the air. There is this difference between the American and the French machines, that the former has grown up with the men who operate it, and is the result of years of long study and practice; the latter have been made by skilled workmen who have never flown, and have been handed ready-made to men who have not yet obtained many of the secrets of the birds.

In principle there is little difference between the machines used by Farman and Delagrange and that of the Wright brothers. The closest resemblance lies with the apparatus with which Santos-Dumont, in 1906, first made a mechanical flight in Europe, for the Brazilian's machine, unlike those which immediately followed, had no tail and had its elevation planes in front.

The Wright machine consists of two superimposed, slightly concave wings, 40 feet from tip to tip, and distant one from the other about eight feet. They are mounted across the rear end of a couple of runners having a strong resemblance to the runners of a sleigh. In front are two smaller superimposed planes, the object of which is to provide for the ascension and descent of the mechanical bird. Naturally, these are pivoted, and can be controlled by the pilot. To the rear are two vertical rudders, made like the wings of a wooden frame covered with canvas. Between the two elevation planes is a small vertical rudder connected with the large ones in the rear, and designed exclusively to act as a tell-tale.

Midway on the lower wing is the 25-horsepower four-cylinder gasoline motor which has come in for so much criticism in France. Though it has given satisfactory service, it is certain that better results could have been obtained by the adoption of one of the light-weight engines put on the market by specialists in aeronautical work. The Wright brothers, however, appear to have taken a pride in constructing the entire apparatus themselves. The engine is the ordinary automobile article, with detail modifications. The cylinders are separate, surrounded by copper water jackets, camshaft within the crankcase operating overhead valves by means of rocker arms. The carbureter has been abolished in favor of direct fuel-feed by means of a pump and distributor mechanism. Ignition is by means of high-tension magneto driven off the camshaft through gears outside



Wright Aeroplane in Successful Flight at Fair Grounds, Le Mans, France.

the crankcase. On the rear end of the engine shaft are two pinions, each one connecting up, by means of a chain, with a propeller shaft a couple of feet above the engine base and to the left and right of it. The two wooden propellers are driven in contrary directions at 400 r.p.m. for 1,000 r.p.m. of the engine.

The gasoline supply is contained in a tall vertical copper cylinder attached to one of the uprights between the two planes. Thus whatever the angle the fuel must flow, and, further, there is no loss of balance through the gasoline swinging in the tank. On the opposite side of the engine, and also attached to the uprights, is the plain, copper-tube radiator.

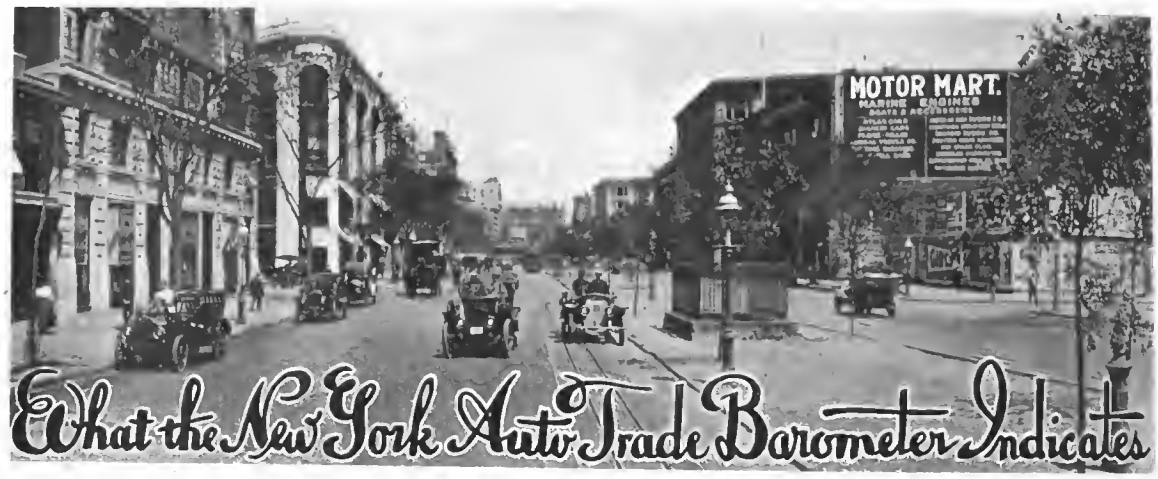
A start is made by placing the apparatus on a single wooden rail grooving into the bottom of the aeroplane. The catapult, as it has been termed, is a simple but effective method of starting, by means of which a rope is attached to the frame, carried forward round a pulley, then under and to the rear of the aeroplane to heavy weights raised and maintained some distance from the ground. On the weights being released the apparatus is violently shot along the rail, and flight occurs immediately.

At the time of starting the pilot is seated on the lower wing, looking forward, with the motor on his right hand. His feet project to rest on a cross beam, and in each hand he has a controlling lever. On the other side of the engine is the seat for a passenger, when one is carried. Control is somewhat difficult, for in addition to keeping the motor running, the pilot had to operate the forward elevation plane, the rear rudder, and the bending of the tips of the wings, one of the distinctive features of the Wright machine and one to which it owes much of its success. It will be readily understood that for one man the position is no sinecure. If a descent is made away from the starting rail it is necessary to mount the apparatus on a small carriage and wheel it back to the rail, the aeroplane not being provided with wheels, as in the case of the French machines. Aeronauts here regard this as one of the weak points, but it would be more correct to see in it an evidence of the more natural conditions under which the Americans have worked, wheels being useless except on specially prepared grounds.

LE MANS, Aug. 22.—Wilbur Wright has had to move to larger quarters, the racecourse on the outskirts of the town being too small for the flights which he intends to undertake at an early date. Eight miles from the present field is the military ground of Auvours, on the Paris road, and seven miles from Le Mans. It is here that the longer flights will be made, permission having been obtained for the use of the ground and for the erection of a shed in which to lodge the apparatus. The construction of this latter has already been commenced. On the new ground it will be possible to make a flight of three miles in a straight line, a condition of affairs which will certainly be to the advantage of the aeronaut and will allow the more accurate measurement of distances covered. The Hunaudieres racecourse is so small that the machine has to continually twist and turn.

Though the large tract of land at Auvours has been secured, it is possible that the smaller course will be maintained and that Wilbur Wright will fly across country from one to the other. The aeronaut himself has made no statement regarding this, but, according to Léon Bollée, who is in his confidence, it is being seriously considered. Two starting appliances are being erected on the Auvours ground at a distance of three miles. It is here that the two 50-kilometer flights, which have to be performed to win the $20,000 prize, will be undertaken.

Showing the Famous Aeroplane with Its Unique Starting Device Ready for Action.



What the New York Auto Trade Barometer Indicates

MORE scared than hurt comes pretty near to expressing retail trade conditions in New York during the selling season of 1908, now at an end for most dealers through the arrival of the 1909 models. New York was the storm center of the panic, and, being closest to Wall Street, was more thickly enshrouded in the atmosphere of despond that was the aftermath of the October crisis than other sections of the country. Then, again, Wall Street being near at hand is a temptation to which many New Yorkers yield, and when times are hard down there the sympathetic depression extends to no small proportion of the moneyed population. Further, "automobile row" gets many customers from those who have made lucky strikes in Wall Street. In times of money market depression and stagnation there is a cessation of buying, not only by the brokers, but also by those who dabble in stocks.

All this was against the buying of luxuries in general, and of automobiles in particular. In the face of all this, show time fears would seem to have been well founded. The outcome of the season, however, has proved the vitality and the permanency of the automobile as a sport and an industry. The results, conditions considered, have been amazing. The failures along Broadway have been insignificant in number and inconsequential in importance. Furthermore, a pretty complete canvass of "automobile row" discloses a gain in business for some, moderate profits for the majority, and an encouraging foundation for next year for all.

The panic came, happily, at a time which made it possible not only for the factories to temporarily curtail their production, but also for the dealers to trim their sails to meet any unfavorable wind that the panic aftermath might set to blowing. Consequently, makers did not try to overload their agents, and the agents put out orders for no more cars than the public could safely digest. As a result, dealers will start on their 1909 campaign with decks clearer than they have ever been at the end of any previous season.

The panic about killed retail selling at the shows, which has always been a harvest time for New York agencies and branches. Business came to a standstill and so continued during winter. With the coming of the spring, however, business began to pick up, timidly at first; but with the arrival of May it was in surprisingly active swing, and by June was at its best. July and August have brought a lot of late buying, though some of it has been of the new crop of cars of the makers who habitually make their bow in midsummer. Much of it has been by buyers, who were well able to purchase cars earlier, but prudently waited for business conditions to cross the safety line and head once more toward the prosperity zone without dispute.

Dealers are looking forward to an early fall trade. New models will more generally than ever before make their appearance in September, which, with the shows put back again to January and no longer obstructing automobile buying, would seem to insure a good fall trade. Along with other business men, automobile dealers are looking forward to a prosperity boom in 1909, and the retail trade is showing its hope and confidence by largely increased orders. Dealers argue with good reason that many men who drove 1906 and 1907 cars in 1908 through prudent economy will exchange them for 1909 cars, and they believe that this considerable contingent of buyers, added to the natural increment of the normal growth of the use of the automobile, given free rein by a return of prosperity, will bring about the biggest business year the motor car industry has ever had.

This is what New York branch managers, dealers and others have to say of the results of 1908 and the prospects of 1909:

Acme.—W. H. Flinn, of Cordner & Flinn: "I have represented the Acme since last autumn. It was not, however, until May 1 that Mr. Cordner and I established the present agency. You see, we have a few 1908 and three new cars on the floor. We think so well of the prospect from what we have already done that we have closed for 1909 for New York, New Jersey, the western half of Massachusetts and England. In fact, we have already appointed English agents and expect considerable export business."

Apperson.—Sidney B. Bowman, of the Bowman Automobile Company: "Trade was slow until May, when business began to pick up and improve. It has been well enough sustained for us to have disposed of some fifty cars. We are arranging for half as many more for next season. We are laying great store by the 1909 Apperson line. It will include a 35-40-horsepower runabout with double ignition at $3,000. We are also to have 25-30 chassis as a three-seated runabout or four-seated roadster with extension cape top at $2,450, which should be a big seller."

Autocar.—Walter C. Evans, manager of the Autocar branch: "This has been a better year than last. I am expecting the new models in September. We are expecting big results from our new Type XVIII 18-horsepower chassis, which will be listed at $2,000, including magneto and batteries. We are preparing to build town car, landaulet and victoria bodies to order for $500 up. Two wheelbases will be furnished—97 and 85 inches. Commercial wagons of all kinds will be built to order on these chassis, which have a capacity of 1,500 pounds."

Baker.—Nathaniel Platt, manager of the Baker Electric branch: "We have done fairly well considering the business depression. The victorias and roadsters have been good sellers. The first of our new runabouts is now at Newport, where it is making a hit. It has a bonnet, and is good for 30 miles an hour. Our runabouts have been showing 90 miles on one charge. We expect another of the new runabouts here in two weeks. We are already taking orders for 1909 victorias and landaulets."

Cadillac.—E. H. Brandt, manager Cadillac Motor Car Company's branch: "I have only been here since July 2, but in that time I have sold sixteen single-cylinder cars and taken orders for thirty of the new $1,400 four-cylinder machines. Our real campaign, however, will begin with our taking possession of our new building on West Fifty-ninth street on October 1. It will have an entrance on Columbus Circle. We will store and look after Cadillacs only. Mr. Leland has supplied our repair shop with the latest machinery and we have floor space for storing eighty cars, despite the fact that a 42 by 65 foot space on the main floor is given over to a showroom and the second floor to executive offices. Four-cylinder deliveries will begin in October and be at the rate of thirty per month for three months. After that we are promised all we can handle. We will go after night-hawks and independent drivers with taxicabs built on single-cylinder chassis, and you will soon see Cadillacs in that field."

Chalmers-Detroit.—Percy Owen, general manager Carl H. Page Company: "I have been a long time in the business, but I have never seen any new car arouse the public interest that has been created by the Chalmers-Detroit. We have actually had as many as 500 visitors in one day. A count one day showed fifty-eight people in the salesrooms at one time. Forty agents have already made applications for territory. Under these conditions, Mr. Page has been to Detroit and succeeded in having our allotment of cars raised to 400. Our district embraces Greater New York, Long Island, Westchester county and Northern New Jersey. We are promised twenty cars the first month, forty the second and sixty the third, which rate will thereafter be maintained. We have been taking retail orders thus early at the rate of five per day, so what will it be when the season is in full swing?"

Corbin.—H. D. Tucker, acting manager of the Corbin branch: "Mr Hutchinson has been transferred to the factory

as sales manager and I have only just taken hold here I have been connected with the branch, however, for two years and am pretty well acquainted with what has been doing here. We have sold 60 per cent. more cars than last year and have cleaned up our 1908 output. The factory, though, is putting through 100 more of Model K, which has a water-cooled motor. New York and Chicago have sold more water- than air-cooled cars. The results in San Francisco, however, have been just the reverse."

Elmore.—A. J. Robinson, of A. Elliot Ranney Company: "This has been the best season we have ever had with the Elmore We were sold out completely by April 15 Since then we have been picking up cars here and there from agents. Our sales have been around seventy-five. We are expecting the first shipment of 1909 cars the first week in September. We have already taken orders for fifteen and expect to dispose of at least 125 cars."

Fiat.—E. R. Hollander, of Fiat Automobile Company: "We have put 110 cars through the custom house and have sold ninety-six or ninety-seven of them."

Ford.—Gaston Plantiff, manager of the Ford branch: "In June our branch did the biggest business in its history. It approximated $240,000 and was for the most part made up of runabouts. We did not get our goods until late, the factory doing little until February. Since then we have had a good season. I don't think business in the aggregate has fallen off 20 per cent. I am speaking, you know, for the entire district handled from the branch. Out-of-town business has increased; in New York it has been somewhat quiet. Our territory extends to Trenton, Hartford and Albany. The new models are promised in September. I may be over-enthusiastic, but the future looks mighty good to me."

Franklin.—Winfield S. Jewell, manager of the Franklin branch: "We have done, I think, fairly well, having disposed of a little over 100 cars. We have handled more of the big and fewer of the small cars than we did in 1907. We have gotten the list price and the freight for every one of our cars and have taken no cars in exchange. Our policy in this respect has been to sell a car for a customer. We have not paid a cent of commission to a sub-agent, a chauffeur or to any salesman not on our staff. We are expecting the new cars next week. Already fifty or sixty customers have notified us that they would buy 1909 cars. Some of them have already placed orders and made deposits."

Garford.—C. R. Teaboldt, sales manager of the Garford Motor Car Company, of New York: "We have cleaned up all of our 1908 models except two. In fact, we have done much better than we expected. Our 1909 cars are at the body factory being equipped, and will be ready in ten days. We are extending our line of agents throughout the district east of the Alleghanies."

Glide and Jackson.—George J. Scott, of the George J. Scott Motor Company: "We did well with the small cars, but the big models rather held fire. In fact, the small cars sold faster than we could get them. They are all gone. We have but one Glide and two Jacksons left over. They are in use as demonstrating cars. We expect our new Glides in September and our 1909 Jacksons in October."

Haynes.—E. W. Haddington, manager of the Haynes branch: "The last of our 1908 cars were disposed of this week. The business of this branch, despite the panic, has

been better than last year. We expected, being in New York, to suffer badly from the panic, but we have done well. In 1908 trade has been the best the Haynes company ever had. The new models are promised for September 10."

Imperial.—E. S. Watson, of Watson & Treadwell: "We did not start until nearly March. We only expected this season to lay a foundation for next year. The results have been good enough to encourage us to continue. This has been a second-hand year. We believe that 1909 will be a new-car season."

Knox.—H. M. Davis, manager of the Knox branch: "Our August business has been ahead of last year. The business men who laid off horses owing to hard times are looking up motor trucks. We are securing many orders from this class. Our pleasure vehicle business has also been ahead of last year's. We are now supplying agents with 1909 models and will begin deliveries to customers the first of the month."

Locomobile.—Ray Trowbridge, superintendent of the Locomobile branch: "Business has been favorable to us. We have sold fifty-five cars more than we did last year and have cleaned up our 1908 allotment. We have always been in a position to sell any cars that our agents might not be ready to take at the time specified in their contracts."

Locomotive.—James Joyce, manager of the automobile department of the American Locomotive Company: "High-priced cars were naturally most affected by the panic, but we have done better than we expected. Our taxicab business has been splendid and the success of this department has put it up to us to produce as many cars as possible. We are surprised how good our cabs are. Reports come to us of thousands of miles without a cent for repairs. We will build more touring cars than ever next season. In fact, our factory has never been running so completely before. Every machine in it is at work."

Lozier.—C. A. Emise, sales manager Lozier Motor Company: "We have had a steady business since January 1, during which time we have sold from five to eight cars per week. Lozier registrations at Albany from January 1 to July 1 show an increase of 89 per cent. It must not be forgotten either that the prices of our cars range from $5,000 to $8,000. We had but three of our 1908 cars unsold on July 1 last. Our 1909 cars are selling at the same rate. For instance, we got rid of seven or eight cars last week. We could not have taken care of our business had it not been a panic year. We are going to prepare for next year, however, by building an addition to our factory."

Maxwell.—Col. K. C. Pardee, of Maxwell-Briscoe, Inc.: "We are ahead of last year in this branch, despite the panic. We have entirely cleaned up our 1908 allotment. Up to July the factory had turned out 3,000 more cars than last year, and we, of course, got our share of the increase."

Mitchell.—C. P. Skinner, of the Mitchell Motor Car Company of New York: "Business has been a hundred per cent. better than last year. We have sold eighty-eight cars. This was all we could get from the factory. We are looking for 300 cars next year. We are expecting our new models in September. We will be prepared to meet the new price competition with a 30-horsepower four-cylinder car ,with magneto and selective transmission, which we will sell at $1,500. The Albany registration shows a gain for the Mitchell of 127 per cent., the figures from January 1 to July 1 showing 193, to 85 for the same period in 1908."

Moon.—Charles A. Duerr, president Moon Motor Car Com-

pany of New York: "This company took the Moon agency on July 1 and since then has sold seven cars, all of them 1909 models. We are figuring on 100 the coming season and are promised shipments at the rate of ten per month."

Mora.—W. W. Burke, manager Mora Motor Car Company's branch: "I did not take charge of the branch until February 1 and the new factory was not completed until May, so I had no right to hope to do much more than establish the Mora in New York in a good position for trade another year. We have done what I should call a fair business, though we have sold more cars than were ever put out in the metropolitan district before. Our line for 1909 will embrace a 24 at $1,850, and a 60 at $2,750; both fours. We will also continue our six."

National and Rambler.—Fred E. Lee, sales manager Homan & Schultz Company: "We have so far done about 75 per cent. of the business of last season. This applies equally to Ramblers and to Nationals. It looks, however, like a late season. In the first place, those who thought themselves poor are now realizing that they are not. Then again, the shows do not take place until late and we are not talking of 1909 cars, which we will not get until the shows."

Oldsmobile.—Gen. John T. Cutting, of the Oldsmobile Company of New York: "We have done a much larger business than we had any right to expect under present financial conditions, and in view of the fact that we were delayed in receiving cars at the beginning of the season, owing to our factory having curtailed production during the panic months. Despite all this, we have sold three-quarters as many cars as we did in 1907, but that year we took more than we placed ordered."

Packard.—M. J. Budlong, manager of the Packard branch: "Our business in this season was way ahead of last year. It kept up prosperous at the factory, which turned out 300 more cars than it did in 1907 and will increase the output by several hundred in 1909."

Peerless.—John A. Clark, of the Peerless Motor Car Company of New York: "We sold the last of our 1908 allotment three months ago and since then have sold all the cars we could buy from other agents. We have doubled our order for 1909 cars. Customers are offering premiums for delivery before October 1. Our business this year was fully 50 per cent. above expectations."

Pierce.—R. W. Slusser, of Harrolds Motor Car Company: "Our manager, Mr. Garden, is away on his vacation, but I can tell you that we have sold all the cars the factory would let us have. The demand for the new cars, which will be out in October, is enormous. We are booking orders for them from photographs and blue prints. We think that as far as big orders are concerned 1909 will be a repetition of 1906."

Pope and Matheson.—A. G. Southworth, of A. G. Southworth & Company: "We have done exceptionally well under the circumstances We ordered and disposed of the same number of Pope-Hartfords as last year, but you must remember that in former years we went beyond our allotment and got cars from other agents. More Mathesons have been sold in New York than ever before, but the former agent had a stock in hand, cut the prices and sold two to our one."

Pullman.—F. Cimiotti, of Cimiotti Bros.: "Our success dinner given early in the summer in celebration of our having disposed of an entire allotment of Pullmans, I think, will answer any question as to this season's business, and the fact that we have doubled our order for 1909 any query as to what we think of the prospects of the year to come."

P. & S. and Simplex.—C. A. Singer, of Palmer & Singer Mfg. Co.: "We did not begin to receive our P. & S. cars from our Milwaukee factory until June 15, so we are practically beginning the 1909 season. The factory has been turning out from seven to ten per week and we have had customers all the time awaiting their arrival."

Rainier.—Paul Lineberger, sales manager of the Rainier Motor Car Company: "We started to make 300 cars, but owing to the panic cut it down to 180. We have but three of these left. Seventy-five per cent. of the cars were sold in New York and the balance by our agencies in Pittsburg, Los Angeles and Chicago. We are planning to build 250 cars."

Renault.—Paul Lacroix, manager American branch of Renault Frères: "The panic did not affect us. In fact, we did better than last year, when we sold 214 cars. We are already over that number, with several months of selling yet to come. I am expecting shortly a new 20-30-horsepower Renault built especially for American roads. It has ten inches' clearance and is lighter and shorter than the standard chassis. It has a 120-inch wheelbase and will sell, complete with runabout body, at $6,000. Next year I will import a 10-horsepower runabout with 3x4 ¾-inch cylinders, to sell at $1,500."

Reo and Premier.—R. M. Owen, of R. M. Owen & Company: "Our local business is a mere detail of our general selling. We have, though, done better in New York than last year. Our business in the country at large has not varied considerably from that of last year. We have been unable to get all the Premiers we wanted."

Stearns.—William Wurster, of Wyckoff, Church & Partridge: "Including cars sold by our branches in Boston, Brooklyn, Philadelphia and Baltimore, we have disposed of 160 machines. Registrations of Stearns cars in this State from January 1 to July 1 were ninety-four, as against forty-six in 1907, an increase of 104 per cent. These sales were practically all local. Our order for next year will be raised to 275 cars. Our contract is $3,000,000 of Stearns cars in three years."

Stevens-Duryea.—Frank Eveland, manager of A. G. Spalding & Bros.: "We were without four-cylinder cars from October till June. During that time, though, we delivered 25 per cent. more six-cylinders than the year before. Since July 1 we have had the largest business in our history for July and August in selling and delivering of cars. We have had since July 1 many sales right off the floor, and now are making prompt deliveries of our four-cylinder cars."

Stoddard-Dayton.—R. S. Newton, of the Atlantic Motor Car Company: "Up to the panic in October, the 1908 cars, which began to come through in August, sold exceedingly well. Everything then fell off till Christmas and then grew gradually better. We sold forty-three cars in May, which was the best month for our business. Our trade as a whole has averaged up to last year's, despite the panic let-up."

Studebaker.—C. F. Reddin, manager of Studebaker Automobile Company branch: "We have doubled our sales of 1908 cars over the 1907 models. We are anticipating big business with our 1909 line, which is to include an autobuggy."

Thomas.—Harry S. Houpt, of the Harry S. Houpt Company: "Our business has been highly satisfactory, considering the panic. We are now doing a better business than we did at the corresponding season last year."

Waltham.—A. G. Bechtel, assistant sales manager of the Waltham branch: "Our selling season does not end until January, when the new cars will be brought out at the show, so you see we have four selling months ahead of us. We have closed out all our big cars and have only 50 of the single-cylinder buckboards left to be sold. Our two-cylinder buckboards have made such a hit that we have but six of them left."

White.—G. W. Bennett, district manager of the White Company: "In our territory we have sold within three cars of double what we did last year. In New York there has been a big improvement over last season. We have but six unsold cars in all our branches, so you see how well stock has been cleaned up in this district. During the entire panic I did not lay off a single salesman. In my opinion, 1909 will be the biggest year in the history of the trade."

Winton.—Charles M. Brown, manager of the Winton branch: "I have only been here, you know, since July 4. However, I have been looking in the books and can tell you that we have done more business in dollars and cents and sold more new and second-hand cars than in 1907. It must not be forgotten, either, that we have been up against a raise in prices from $2,500 to $3,500 and $4,500. We have not only cleaned up on our allotment, but also drawn on other branches."

WHAT IS THE BEST RELATION OF BORE TO STROKE?*

By Gerard Lavergne.

BEFORE directly taking up this subject, which is one of considerable interest to designers and car owners alike, at the present moment, it will be well to go briefly into the subject of the power of the motor as a necessary preliminary, in order to show the importance of the stroke as a factor. To do this, we will take the formula of M. Witz, which is as follows:

$$P = 4 K p \frac{\pi D^2 L \omega}{4 \times 60 \times 75}$$

In which P represents the maximum output of the motor in horsepower, the formulæ and tables of the present article dealing with four-cylinder motors; K, the mechanical efficiency of the motor, which it is prudent not to estimate as being above 75 per cent.; p, the mean effective pressure per square centimeter of the explosive gases, expressed in kilogrammes, and D and L, the bore of the cylinders and the stroke of the pistons in millimeters, ω, the angular velocity of the motor in r.p.m. But as the application of this formula would be found very difficult in practice, we have eliminated the mean effective pressure, p, the angular velocity and the stroke L.

The impossibility of conveniently determining the mean pressure causes us to drop it, though possibly by doing so we have neglected one of the elements whose influence would be the most interesting that could be shown. However, with equal compression and a similar method of ignition, and there is scarcely anything more standard than ignition by magneto, whether high or low tension, the m.e.p. of one motor is practically on an equality with that of another. We have based our elimination of the angular velocity and the stroke on the fact that they do not enter into the formula, except by their product, ωL, and that, at an equal piston speed, when the stroke L is increased, the angular velocity decreases in such a manner that the product ωL remains nearly constant. In fact, we have adopted the formulæ, $P = 0.0028\ D^3$, adopted by the *Commission Technique de l'Automobile Club de France*, and $P = 0.0025\ D^3$, recommended by M. Arnoux. Since that time numerous other formulæ have been proposed. The relation of the parabolic form is the following: $P = K D^m$, which, put in logarithmic form, becomes $\log D = \frac{1}{m}(\log P - \log K)$, which may be represented graphically by a straight line, of which the angular coefficient is 1/m, and of which the point of contact with the axis of the abscissæ furnishes, on the logarithmic scale, the value of K.

Carrying on the abscissæ and the ordinates, respectively, the values of the decimal logarithms of the powers and bores (the logarithmic scales, written the length of the two axes of the coordinates, permitting the direct reading of the values of the powers and bores corresponding to any point on the diagram), it will be found that the relative points of 105 four-cylinder motors are almost all comprised within two lines corresponding to the parabolas having for their equations respectively:

$$P = 0.044\ D^{2.1}$$
$$P = 0.167\ D^{2.82}$$

Owing to its clearness, this diagram may be utilized to advantage for the study of the comparison of the experimental results relative to different types of motors.

Unfortunately all formulæ of the type $P = K D^m$, not taking into account anything but the bore, and in which, in every case, the influence of the elements, K, p, ωL, is not present except in a numerical coefficient, is not exact. It will suffice to make this clear, to recall that we have taken, in order to eliminate the elements ω and L from the Witz formula, the constance of the product ωL, which is itself based on the constance of the linear speed of the piston. If we now refer to the table given by M. Arnoux in his article *The Predetermination of the Maximum Power of Explosive Motors* (published in The Automobile of January 24, 1907), we can extract Table I, which we have completed by the addition of the piston speeds and relation of the bore to the stroke. We can see from this that the piston speeds vary from 3.62 meters to 8 meters per minute, and that it increases with the bore and power of the motor. While this factor varies in the ratio of 1 to 2.2, the r.p.m. rate (if in M. Arnoux's table the single exception with a speed of 950 r.p.m. be omitted) only has a range of from 1,100 to 1,650, or a ratio of 1 to 1.5.

The product ωL, under such conditions, would have, in the case of motor No. 1 of the table, the value $3.62 \times 1,450 = 5,249$, and in the case of motor No. 26, $8 \times 1,200 = 9,600$. Its constance may be judged from this, and at the same time the importance of taking the stroke into consideration when calculating the horsepower of a motor may be realized. This is so well understood that many authors have proposed formulæ in which they have neglected the influence of the angular velocity, while giving particular importance to the stroke L. In 1904, M. Favron proposed the formula, $P = 0.007\ D^m\ L^n$, in which it is necessary to have $m = 2.1$ to 2.15, and $n = 0.6$ to 0.8, according to the results of experiments with a series of Aster motors, having bores ranging from 80 to 140 mm. Later, and in order to avoid the employment of logarithms, he proposed the substitution for the preceding formula of the following: $P = 0.007 D^2 L^{0.5}$. But as both the application and the accuracy of the last are not as great as those of the first formulæ, he developed in 1907 a short rule of calculation which permits of directly reading the results of the better formula. M. Faroux successively proposed $P = 0.00002956\ D^2\ L^{0.6}$ and $P = 0.00002956\ D^{2.3}\ L^{0.7}$. However that may be, the influence of the stroke has been sufficiently demonstrated, and it is the purpose of this article to study the latter.

TABLE I.

Data Concerning a Number of Four-cylinder Motors.

Brake H.P.	R.P.M.	Piston Speed Metres per Sec.	Bore, mm.	Stroke, mm.	Bore to Stroke.
10	1,450	3.62	55	75	1.15
12.5	1,600	3.66	65	70	1.07
20	1,400	5.50	90	120	1.33
18	950	4.11	90	130	1.44
22.5	1,500	5.00	90	100	1.11
24	1,500	5.05	90	95	1.05
33.5	1,350	5.35	104	130	1.25
31.3	1,250	5.00	104	120	1.15
27.7	1,550	5.58	104	110	1.05
25.4	1,500	6.00	104	120	1.15
43	1,250	5.33	120	140	1.15
40.5	1,150	5.55	120	145	1.20
47	1,300	5.53	120	130	1.08
52	1,350	5.49	120	122	1.01
67	1,300	6.28	140	145	1.03
70	1,380	6.44	140	140	1.00
60	1,150	5.13	140	150	1.14
63.5	1,260	6.30	140	150	1.07
75	1,400	6.44	140	138	0.98
82	1,250	6.56	155	150	1.03
93	1,400	7.00	155	150	0.96
79	1,150	6.13	155	160	1.03
85	1,350	6.75	155	150	0.96
86	1,250	7.16	160	172	1.07
95	1,300	7.15	150	155	1.03
101	1,200	8.00	150	200	1.25
101.5	1,350	6.20	160	140	0.87
90	1,250	7.08	160	170	1.06
80	1,200	7.20	160	180	1.12
105	1,350	7.11	150	158	0.98

Comparative Data of a Number of Motors.

Theoretical Inconveniences of a Long Stroke.

We will begin by taking up the disadvantages of a long stroke, the following of which are irrefutable:

1.—The long stroke necessarily increases the space occupied by the motor, which is naturally not an inconvenience in the case of the stationary motor, on which it is universally regarded as advantageous. It is likewise for the automobile motor, but the latter is always mounted vertically on the forward part of the car (the horizontal motor unjustly proscribed by fashion would avoid this objection). In fact, it has been calcu-

*Translated from *Omnia*, Paris, by Charles B. Hayward.

lated that a four-cylinder motor of 155 mm. bore, such as those which lined up in the recent Grand Prix race, would, if given a stroke of 240 mm., probably a great advantage in both power and efficiency, have resulted in a car with a bonnet about 1.60 metres above ground, an excess of elevation of the center of gravity which would have evil consequences on its stability.*

2.—The increased length of the stroke and that of the crank (equal to one-half that of the former), if transformed, with the same connecting rod, into an increase in the latter's angularity, with the consequent necessity for a greater offset.

3.—It increases the weight of the motor, and as a result diminishes its power per pound.

The *Commission Technique de l'Automobile Club de France*, in the preparation of the program for its races for motors of high power for weight, made a special investigation of the motors of a number of builders. The results were published in the form of a table and a diagram. From the former we have extracted our Table II, in which the sixth column gives the weight of the motor, including that of the carbureter, ignition system complete, starting crank, water pipes, radiator with water reservoir, grease cups, etc., but without the weight of the inlet manifold, exhaust piping, water, gasoline, oil or grease. The motors are classified in the order of their descending power for weight (*puissance massique*). We there see that among the first five there are three comparatively short motors and two "square"; then there are several long motors, and the eleventh is really short. However, after a general fashion the table clearly proves that the weight per horsepower increases with an increase in the stroke, and experience verifies this deduction.

TABLE II.

Weights of Motors per Horse-power from Data Supplied by Makers.

Bore, mm.	Stroke, mm.	Bore to Stroke.	R.P.M.	HP.	Wt. Kilos.	Wt. per HP.
170	150	0.88	1,300	102	370	3.62
150	150	1.00	1,000	80	300	3.75
180	170	0.94	1,100	127	480	3.78
160	98	0.61	1,300	95	395	4.15
160	160	1.00	1,100	90	380	4.22
155	175	1.12	1,100	100	450	4.50
145	160	1.10	1,360	84	412	4.90
102	116	1.13	1,460	37	233	6.29
120	140	1.16	1,200	44	300	6.81
120	140	1.16	1,200	60	420	7.00
150	138	0.92	1,200	70	497	7.01
110	130	1.18	1,500	43	311	7.24
112	130	1.16	1,200	38	368	9.68
110	120	1.09	1,100	35	350	10.00
110	130	1.18	1,300	35	353	10.08

Weight per Horsepower Compared with Other Factors.

On the other hand, it is not necessary to exaggerate the importance of inconveniences attendant upon a long stroke. As we have already mentioned, the weight of a motor from which its weight per horsepower is calculated does not comprise the weight of its supplies, and particularly that of gasoline. But long-distance touring cars must carry a tank sufficiently large to make frequent replenishment unnecessary. As an offset to this, as we will show later on, the short motor does not utilize so effectively the results of expansion as does the long motor, and should consume more than the latter. If, then, it is desired that with the short motor the necessity of refilling the tank should occur at the same intervals as with the long motor, it will be necessary to increase its volume and weight. But, everything considered, the weight per horsepower of the motor-tank group should be about as great with one as with the other.

4.—In lengthening the cylinder and, in consequence, increasing the piston speed, the duration of the various phases of the cycle, and particularly that of combustion and expansion, the long motor increases the length of the cooling jacket, with the consequent heat losses that this entails, so that the calories contained in the combustible are not as effectively utilized.

For a long time past M. A. Witz has called attention to the striking influence of the walls of the cylinder on the efficiency. Following experiments made with a motor, in which the piston speed under the action of the explosive mixture could be increased or moderated at will, he demonstrated that the cooling of the gas in contact with a wall more or less hot, modified the order of combustion and expansion. By reducing to the greatest extent possible this cooling action, the efficiency of the motor is increased; the calories drawn from the combustion cycle by the cold water and wasted in the air are diminished. It is expedient, then, to have the motor function with the cylinder walls as warm as possible in order to effect the combustion and expansion in the minimum period, which cannot be done with the long stroke, assuming the same piston speed.

But since the question here is one of time, by increasing the speed of the piston (and this is what justifies the notable variations appearing in Table I), this disadvantage of the long stroke disappears, and, it must be added, this is the only one that presents itself from the point of view of theoretical heat efficiency. This naturally leads us to a study of its advantages.

Theoretical Advantages of a Long Stroke.

1.—By increasing the duration of the various phases of the cycle, with an equal piston speed, the gaseous mixture becomes more intimate in the carbureter, in the manifold, and in the cylinder, where it remains a longer period (it is true in greater mass, as the cylinder is larger); the ignition and combustion take place under better conditions; finally, and above all, the expansion is more integral, the calories utilized more numerous, and those rejected to the atmosphere with the exhaust gases of less importance. The exhaust is more effectively accomplished, and the combustion chamber emptied to a greater extent, thus permitting of a larger charge of fresh gas being aspirated in the same period of time.

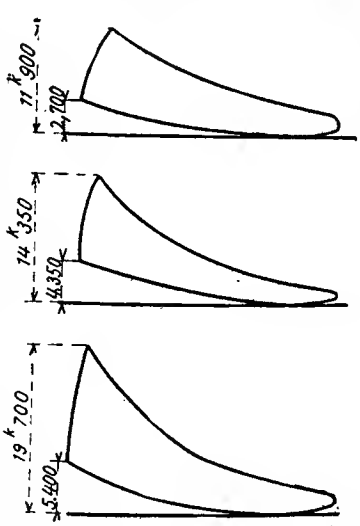


Fig. 1.—Effect of Increasing Compression.

2.—From the viewpoint of mechanical efficiency, the long stroke is also an advantage. The resistance offered by the moving parts of the mechanism should, in fact, be calculated with reference to the maximum stresses they are called upon to endure in the form of pressure exerted on the head of the piston by the explosion. On the other hand, it is not the maximum pressure so much as the mean effective pressure that determines the power, and it may be said that the mechanism is being utilized to a greater degree when the maximum and mean pressures are close to one another. In the majority of motors their relation is equal to 15; it is too great, and in diminishing the surface of the piston and increasing its stroke this is diminished also, making a much smoother running motor.

3.—With an equal density of mixture, the same volume of the combustion chamber in which the compression takes place, the latter is, for a given bore, proportional to the stroke of the piston. The advantages of high compression are well known:

(a.) It raises the temperature of the mixture before ignition, rendering the latter more prompt and integral, and with it the more complete combustion and utilization of the fuel.

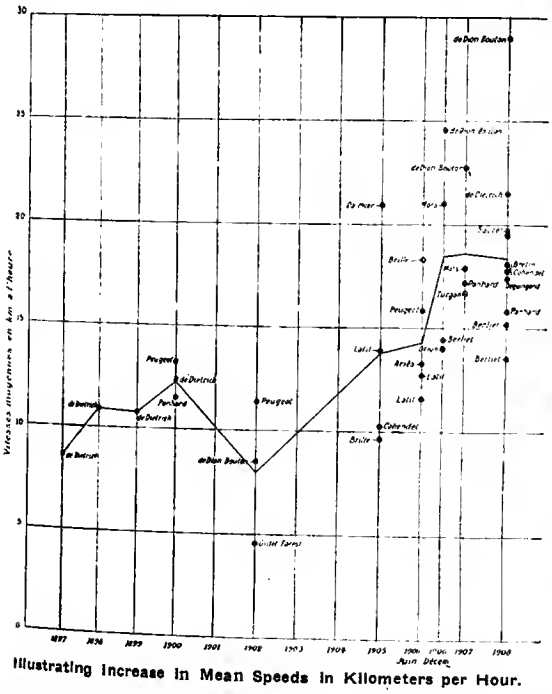
(b.) Compare the diagrams of Fig. 1, taken on the same motor, with the same combustible mixture and operating with a constantly increasing compression: 2.70 kilogrammes; 4.25 kilogrammes, and 5.40 kilogrammes per square centimetre. The line of the card showing the explosion is heightened and lengthened as the compression increases. The pressure at the end

*Experience has shown that for racing cars, the connecting rod should be four times as long as the crank; an increase of hut 20 mm. in the stroke is attended by an increased height of the motor of 100 mm.

of the stroke has the respective values of 11.90, 14.35 and 19.70 kilogrammes, and the mean pressure 5.04, 6.0, and 6.94 kilogrammes. The area of the diagrams, representing a measure of the indicated power, follows an analogous progression. It is the same with the indicated efficiency, since the mixture introduced only varies in volume, and not in nature, and with the same expense of fuel a greater amount of work is obtained.

(c) The increase in the compression decreases, as we have already said, the duration of the explosion, permits of giving the piston a greater linear speed, and shortens the duration of the cooling effect, combining the advantages of slight cooling and long expansion, and overcoming in this manner the sole objection which we have made on the latter score, from the point of view of thermal efficiency.

But what degree of compression should be adopted? M. Marchis has estimated that 2.5 to 5 kilogrammes per square centimeter, which represents present practice, could readily be increased to 6 to 7 kilogrammes without modifying to any extent the essentials of the motor. The latter figure may be slightly exaggerated, and, in fact, high compression becomes useless when it can only be employed by an excessive dilution of the mixture to avoid auto-ignition. Customarily 13.5 parts of air are mixed with one of gasoline, and it seems that the proportion could be carried to 15 to 1 with advantage, and then the compression could be raised to 6 kilogrammes without any fear of auto-ignition. However, as a high compression renders the recovery of the motor more difficult, it will be more prudent to adopt as a standard for the touring car a compression of 5 kilogrammes per square centimeter.



Illustrating Increase in Mean Speeds in Kilometers per Hour.

4—For a given piston speed the long motor will wear less than the short one, for the very good reason that there are fewer reversals of the movement of the piston and connecting rod—reversals that are always sudden and which tend to disrupt the mechanism. The long stroke and the smaller number of turns also diminish the friction, and should increase the efficiency.

5—A motor having a high angular velocity is more difficult to regulate than a motor with a less number of r.p.m. The reasoning *a priori* can clearly be concluded in favor of the long motor.

What is the teaching of experience on the subject? A short motor, having a bore of 152 mm. and a stroke of 110 mm., with a piston speed of 7.33 metres per second, turning over at about 2,000 r.p.m., develops 100 horsepower. In one minute it aspires 1,000 cylinderfuls, or 8,000 litres, of carbureted mixture, equivalent to 80 litres per horsepower minute. A long motor, having a bore of 130 mm. and a stroke of 150 mm., with a piston speed of 6 metres per second, turning over at about 1,200 r.p.m., aspires 600 cylinderfuls per minute and develops 70 horsepower. The consumption per horsepower minute is but 68 litres.

M. Faroux reports that a well-known manufacturer of light cars, wishing to decide upon a single-cylinder type of 100 mm. bore, constructed several varying types and submitted them to severe comparative trials. A stroke of 140 mm. gave 14 horsepower, which was considerably better than dimensions of 100 by 120 produced. By further increasing the stroke to 150 mm. the power increased to 15.5, and finally a stroke of 170 mm. produced 18 horsepower, with a slightly decreased consumption per horsepower hour than was the case with the 100 by 140 motor, which gave but 14 horsepower. Accordingly, experience may be said to substantiate the theoretical deductions. We will show later the results obtained by recent Grand Prix cars.

ROLLER BEARING AXLES FOR HEAVY TRUCKS

Among the products that are being brought out for the season of 1909 by the Timken Roller Bearing Axle Company, Canton, O., for business wagon makers is a line of heavy roller-bearing axles specially designed for heavy commercial work. As in the lighter models turned out by the same company, the object has been to provide an axle in which friction has been reduced to a negligible quantity; in other words, one that will have the greatest carrying capacity per unit of bearing, and one that will withstand both radial load and end thrust without the use of extra bearings to take care of the latter. This new axle, which is illustrated by the accompanying cuts, is of the I beam type of 2 1-2 by 4-inch section, and is equipped with Timken roller-bearings in the steering heads, universal steering joint connections and large knuckles of the Elliott type, hardened and ground steel bushings, grease cups and other necessary fittings. It is designed to carry a load, including the truck, of 18,000 pounds. The top view of this new axle shows the great range of centers for seating springs that is provided, the pads being forged integral with the axle, while the seats can be located where desired. The attention now being paid to special parts for the commercial vehicle affords excellent evidence of the increasing demand for cars of this type and for all classes of service up to the heaviest, in which the parts must be unusually strong.

Plan View Showing Range for Seating Spring Centers.

Medium Weight Axle for Commercial Work.

Heavy Type Timken Axle for Large Trucks.

LETTERS INTERESTING AND INSTRUCTIVE

FOCUS OF ACETYLENE HEADLIGHTS.

Editor THE AUTOMOBILE:

[1,516.]—I have been much annoyed lately by a very mysterious trouble affecting one of the acetylene headlights on my car, and there is nothing that I can think of that even suggests a method of remedying the difficulty. If your knowledge will help me out, I certainly will greatly appreciate having the benefit of it. The derangement is confined to one lamp, of the two that are fed from a single generator, and causes the light from this lamp to slant upward, so that it does not strike the road at all, except in coming from a level onto a hill. The result is that the lamp, though it gives a good light, throws this light in such a direction as to make it practically useless for driving. I thought at first that the reflector, which is of the usual glass kind, might have become tilted or displaced, but there are no signs of this, the lamp being of very substantial construction, with heavy brass parts holding the reflector securely in place. Is it possible that the reflector could be in any way warped from the heat of the flame?

Birmingham, Ala. JOHN W. FEENEY.

The difficulty appears to be due to the position of the flame, which must be slightly below instead of directly in the focus of the lens mirror, where it should be. A fore or aft displacement away from the focus would have the effect of spreading the beam, but from your letter we infer that the beam is fairly concentrated, only projected in the wrong direction, showing a displacement of the flame in a plane at right angles to the axis of the mirror. A possible cause of the displacement may be in the recent replacement of the burner tip with one that starts too low for the lamp. But a more likely cause—one that often gives the symptoms you describe—is a weak flame, due to the clogging of the burner openings. In such a case the center of luminosity of the flame will be materially lower than the normal, with the result that the light rays strike the lens at such an angle as to be reflected too high. The remedy is cleaning the burner with a fine wire, or better still, to replace it with a new one.

QUERIES ON TWO POINTS OF INTEREST.

Editor THE AUTOMOBILE:

[1,517.]—I should like some enlightenment on the following two subjects: (1) Why will spark plugs miss fire with a gap of 1-64 inch, and fire regularly with a gap of 1-32 inch?

(2) I have been awaiting information asked some time ago by a correspondent owning an Autocar, regarding the so-called "puddle" carhureter (probably the 1908 Holley). What can the Ford runabout owners say about them? SPARK GAP.

Somerville, Mass.

Do you mean why does the spark plug miss fire, or why does the cylinder in which it is located fail to fire its charge when the spark plug in it has the smaller gap? In the latter case, we should say it was a case of the mixture and not of the spark plug alone. In other words, the spark caused by the current bridging the smaller gap is not sufficient to fire the mixture in the cylinder, whereas the 1-32-inch spark is. It must also be borne in mind, that the spark which actually takes place in the cylinder is nothing like as large as that which is seen when the current is caused to bridge the gap of the plug in the open air. This is because of the greater resistance of the mixture in the cylinder, due to the increased compression. The spark which occurs when the points are only 1-64 inch apart, may appear strong and sufficient in the open air, but it is much weaker when subjected to the compression in the cylinder, and is probably reduced to a point where it does not raise the temperature of the gases immediately surrounding it to a point where they will ignite with the small spark caused by the gap in question. It is not that the current fails to create a spark at the gap, but the spark thus made is insufficient.

We again call the attention of our subscribers to your second query and trust that some of them will come forward in the near future with the desired information.

FORMULA OF THE ALGONQUIN HILL CLIMB.

Editor THE AUTOMOBILE:

[1,518.]—Will you kindly enlighten me in your "Letters Interesting and Instructive" how the efficiency of an engine may be arrived at by using the Chicago Motor Club's formula, which they employed at the hill-climb at Algonquin, August 15? I believe they multiply the cylinder displacement by the time made on two hills, and divide the result by the weight of the car, including the driver.

New York City. S. E. T.

Your information concerning the formula is correct, with the exception of the first item, which should be the piston area, instead of the cylinder displacement. Assuming the same mean effective pressure, the power of the engine increases as the square of the diameter of the bore, in other words, the piston area, so that this has been taken as the factor representing the power of the motor. Hence, we have in the formula in question, the product of *power* by *time*, divided by *weight moved* through a given distance, the result of which is the measure of efficiency of the car. Of course, it can only be approximate owing to the important factor of power being a variable that may differ very greatly. Nor does it take into account the personal equation in the shape of the driver, as skilful handling may make several seconds difference in the time required to ascend the hill, but this of course is something that could not be equalized by any method of calculation, so that taken all in all, the formula may be said to work out equally well, in favor of all the competing cars, particularly as the latter are classified according to size and power as a preliminary.

MOTOR MISSES WHEN RUN LIGHT.

Editor THE AUTOMOBILE:

[1,519.]—Will you please answer through "Letters Interesting and Instructive" the following questions: I have an opposed 5 by 5 automobile motor, water-cooled, which pulls good under a load, but going down hill it will miss half of the explosions. Also misses when running idle, but give it the throttle and it fires all right. What is the cause of this?

What is the cause of the outer casings cracking at the clincher? Same are 32 by 4, and have only run 723 miles. Car weight is 2,000 pounds. They have never been punctured. R. H. DOE.

Adrian, Minn.

It seems quite evident that it is not getting sufficient gasoline when running light to enable it fire regularly. Either open the gasoline needle valve slightly or correct the air adjustment so that it does not get too much air when not under load. The reason that it fires regularly when running loaded is due to the greatly increased suction exerted by the pistons and, as a consequence, the increased amount of fuel that is drawn through the nozzle. We do not know exactly what to ascribe this failure of the tire to, without more information, or, in fact, a view of one of the casings. Speaking generally, however, it may be due to having run the tire without being properly inflated, and may actually be a form of rim cutting. Or it is possible that it may be a defect in that particular casing.

WHAT IS MEANT BY A HORSEPOWER?

Editor THE AUTOMOBILE:

[1,520.]—If it is not too much trouble, will you please tell me what a horsepower is? Also how far it is by road from Mahanoy City, Pa., to Chicago, Ill.? I was referred to you by the editor of "Popular Mechanics." ANDREW DEMEETER.

Shenandoah, Pa.

Horsepower is a rate of performing work, the foot-pound being the unit of work. James Watts figured that a horse was capable of lifting 33,000 pounds one foot per minute, or in other words, of performing 33,000 foot-pounds of useful work per minute, and he established this as a standard which has since been universally followed.

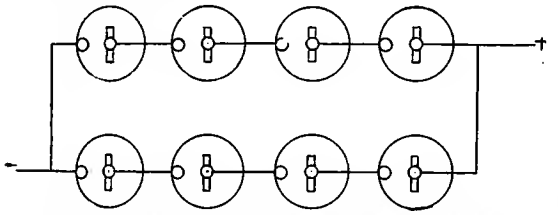
The distance from Mahanoy City, Pa., to Chicago, Ill., depends very largely upon which way you would go, as it is

possible either to start northward toward Elmira or southward toward Harrisburg or Altoona, in each case connecting with a trunk line highway to Chicago. An average would put the distance between 800 and 900 miles.

OLD NEWSPAPERS AS AN AID TO TOURING.

Editor THE AUTOMOBILE:

[1,521.]—I have found it a good plan to always carry several newspapers in the car when touring. If the rear wheels start to spin round in a muddy spot, a couple of newspapers spread over the mud will often enable the rear wheels to climb out, thus avoiding the necessity of putting on the chains in an unpleasant place. Newspapers will also be found handy when any adjustments have to be made under the car.



Series-Multiple Wiring of Dry Cells Increases Mileage.

I have been able to obtain much greater mileage from four dry cells than from six dry cells, wired in series. When six cells are used, a much greater current is forced through the coils, which rapidly exhausts the batteries and also causes pitting and burning of the platinum contact points. If one wishes to use more cells it is better to connect them in series-parallel, i.e., two groups of four cells, connected in multiple, as shown by the accompanying sketch. When connected in this manner, they last quite a while.

Allegheny, Pa. MURRAY FAHNESTOCK.

The use of newspapers for the purpose of protecting one's clothing and of saving as much of one's temper as possible, when it is compulsory to stay for any length of time underneath the car is such a simple expedient that it can well be recommended to those who tour. Even where there does not happen to be any mud present, it saves the necessity of having to brush a goodly coating of road dirt from one's clothes, and doubtless even an experienced chemist would be surprised to find the number of undesirable constituents to be found in road dirt.

This form of connecting up dry cells has long been recommended by builders of cars, and the manufacturers of dry cells themselves, and we have also always taken pains to point it out to those who complain of poor service from dry cells. Connecting them in series multiple in this manner, as shown by your sketch, is merely providing a factor of safety which prevents the cells from being overworked constantly, and which also permits them to deliver their output at a rate better suited to their capacity, and in this way their active life is greatly prolonged.

TO PREVENT GRADE CROSSING ACCIDENTS.

Editor THE AUTOMOBILE:

[1,522.]—I notice that in spite of the great number of recent accidents at unguarded grade crossings and the resulting, yet resultless, talk that has followed, these accidents still continue. I would like to propose a new scheme, which, though cheap in itself, would not allow this wholesale loss of life to continue. By placing this in your "Lettere Interesting and Instructive," I believe that it will receive due attention from all those interested. Leaving at the railroad tracks the present T sign, "Look out for the cars," I propose that on each side of the crossing, at from a half to a quarter mile out from the railroad tracks, a similar, or some conspicuous warning, sign be placed so that automobiles going in either direction will notice it. Then, at no matter what rate the machine is going, the driver, seeing the sign, will have sufficient time to slow down and have the machine under perfect control when the sign by the tracks comes into view. Then one of the party could get out, cross the tracks, and signal the driver to come ahead or not, just as the conductors on the trolleys do.

Under present conditions, where they try to remedy the danger at a place where the road makes a sudden bend and hides the crossing till just upon it, by placing a flagman there—even if they put gates there—the driver will have no more of a chance to escape the danger than if no man was there. In the nighttime a red light or some illuminating scheme to light up the sign could be placed on the first post. For a few cents a week some resident nearby would willingly attend to the lamps. Then another lamp on the post by the tracks will show the motorist where the tracks are. In this way, be it night or day, be no longer drives along ignorant of danger ahead.

If the automobile clubs would get together, they could easily make railroads, the county or townships—whichever is responsible—place these signs on the roads. Why not let the clubs start in immediately themselves and set the example? It certainly would be much cheaper than putting men at the crossings and installing gates; the cost would be comparatively nothing. Surely human life is worth that much. For those reckless and heedless drivers who have more than harmed the reputation of the motoring public, should they continue their reckless pace and ignore such warnings and signals as they do the law, then let them dash on to that dreadful, inevitable, yet deserving fate. AUSTIN M. WOLF.

New York City.

REDUCING THE DANGERS OF TRACK RACING.

Editor THE AUTOMOBILE:

[1,523.]—As it is reported that more automobile races are to be held on the present horse tracks, it may be that a suggestion as to a method which, in the writer's opinion, would greatly reduce the danger attending such races, will be of interest. If track racing accidents are investigated it will be found that in most cases the trouble was caused by the vehicle, after leaving the track at a turn, dashing into either spectators, fences or trees or running over banks, and that had the driver sufficient cleared ground outside the track to have brought his vehicle under control after leaving it and before the obstruction or danger point was reached no disastrous results would have followed. It will also be found that even those few accidents due to collisions or breakage of parts might have, in a large measure, been prevented from having serious results if the driver had a place outside of the track which he could have run on to in an emergency. It is believed that the danger of reasonably restricted automobile races upon horse tracks could be reduced by means of the suggested cleared ground to such an extent that it would not be greater than that on a specially constructed track where races were held without restrictions.

The cleared ground should always extend around turns beyond the commencement of the straight parts at both inside and outside of the track. It need not be exactly level (if banked so much the better), and should be left soft in order to check a vehicle running on to it quickly as possible. There should not be any gutters that might upset a machine between this cleared ground and the track and all spectators should be kept off of it. This latter, it is thought, would be comparatively easy, as the principal reason why spectators persist in getting close to the track at present is the fact that the fences, usually near its edge, not only obstruct the view of anyone some distance back from them, but also form a very advantageous support to sit or lean on. If fences are necessary, they should be as far as possible from the track at the curves, so as to both be out of the way of any automobile that leaves the track and to render it unnecessary to attempt to drive the spectators back from them.

In closing, the writer would say that he would like to hear of other methods of reducing the danger of track racing, as by a discussion of the subject it may be possible to reach some inexpensive plan which will make it at least as safe as other sports and which will enable the holding of race meets, and particularly 24-hour races, without fear that they will be marred by serious accidents. A. E. OSBORNE.

New York City.

JERSEY SEASHORE TRAPS WORKING FULL BLAST.

Editor THE AUTOMOBILE:

[1,524.]—Would you please inform all your readers that intend coming to Asbury Park and other points on the Jersey coast to drive with care, as there are police traps from Red Bank, N. J., to Point Pleasant? As far as I can find out, from Sunday to the present time there have been some 80 arrested and fined. In Point Pleasant they fine them for exceeding 10 miles per hour. Some got fined when found they were going only 12 miles per hour.

It's the same old story; the speeders get away and the more careful and sane users of the road have to stand for all the bad that the reckless drivers did this Summer. Right here I would like to appeal to all users of the automobile to drive with care and cut out the road racing. If you don't it will be only a short time till we will have to quit autoing in the country, as the small towns are going to make it hot for us. There is no use in saying they cannot do so, because they can, as some found out Sunday around here as it stands now. Every time we go out we are in fear of arrest, and if that feeling is caused to be kept up, it is going to kill autoing for pleasure. R. A. C.

Asbury Park, N. J.

POINTS OF INTEREST TO AUTO REPAIRERS

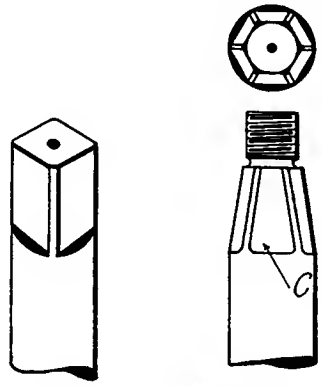
AS a rule, all threaded connections in the gasoline line should be soldered, as this is the only way to insure their permanency. Occasionally, however, it is inconvenient or undesirable to solder such a connection, and in that case other means must be taken to insure its tightness. Dry soap is frequently used for such joints. A better substance, however, is a hard paste of soap and fine emery. The emery cuts the threads and permits the joint to be screwed together further and tighter than soap alone, while making a joint that can easily be taken apart.

One of the accompanying illustrations shows a handy wrench, which can be made in a few minutes from a scrap of ⅛ or 3-16-inch flat iron stock, for gasoline valves having squared stems unprovided with a handle or wheel for turning them. By shaping the end as illustrated, the wrench is easily guided to the correct position on the stem, even when the latter cannot be seen and the valve has to be closed by feeling only. A strong string or bit of chain may be run through the wire ring and secured with a few inches of slack to the valve itself, thus making the wrench always handy when it is wanted.

Homemade Gasoline Valve Wrench.

Filleting Shafts with Squared Ends.

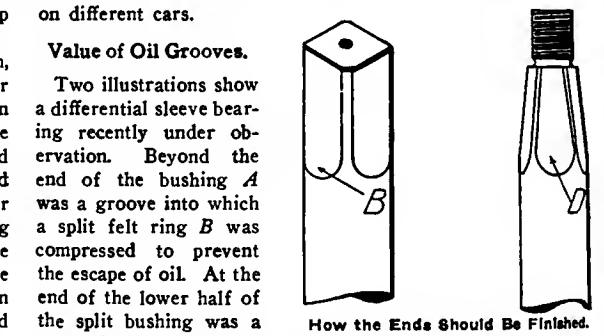
A shaft to which a gear is attached by a squared or hexagonal section at one end is obviously weaker at that end than elsewhere, unless the end has been enlarged so that the diameter over the flats is equal to the diameter of the round part of the shaft. In some cars this precaution has been overlooked, and the flats are milled off from the round contour of the shaft, which is thereby reduced in section. Among the parts in which this construction will be found are the live axle shafts, the differential shafts of a chain-driven car, the bevel pinion shaft of a live-axle car, and the shafts to which the propeller shaft universal joints are attached. A shaft containing no more than 40 "points" of carbon, or a nickel or chrome nickel steel shaft, will twist noticeably before it breaks, provided it has a chance. If the rear axle is of the floating type, the squared ends of the shaft will be a loose fit in the differential gears and the wheel hubs, and there will probably be ⅛ inch or more where the squared portion adjoins the round, where this twist will appear. If at this point there is a well-defined shoulder, *A*, the fracture when it comes will take place at the shoulder, and it will probably occur a good deal sooner than if there were an easy fillet *B* connecting the round and squared portions. In case the shaft is hexagonal and a taper fit in the gear, there is a chance for the same thing to occur, since the gear is not expected to fetch up against the shoulder at the end of the hexagonal portion. *D* is the hexagonal shaft with the fillet used. It is a good idea when a car is overhauled to examine shafts such as these to see whether or not there are signs of twisting. If there are, it will be policy to replace the shafts without waiting for the inevitable fracture to occur. If there is no sign of twisting, it will be extremely easy to help the chance of durability by putting fillets in place of the shoulders. This may be done on an emery wheel if the shoulder is small, or in a shaper or milling machine if the shaft is squared. The illustrations show good and bad forms of squared and hexagonal ends as found on different cars.



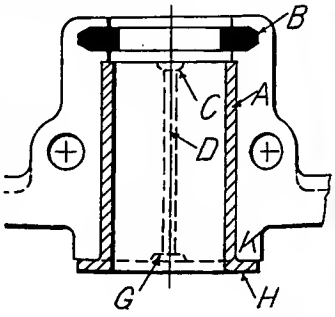
Illustrating Poor Shaft Design.

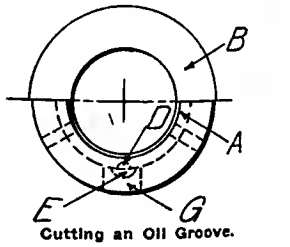
Value of Oil Grooves.

Two illustrations show a differential sleeve bearing recently under observation. Beyond the end of the bushing *A* was a groove into which a split felt ring *B* was compressed to prevent the escape of oil. At the end of the lower half of the split bushing was a notch *C* about 3-16 by ⅛ inch, by way of which it was evidently the intention for oil working to that end of the bearing to return to the gearcase. This excellent idea of the designer had in some manner gone astray, for the return oil groove *D*, which by the way was cut in the under portion of the bushing itself, was hardly more than 1-16 inch wide and 1-32 inch deep, certainly by no means large enough to afford a passage for the thick oil commonly used in gear cases, since capillary action alone would have prevented the oil from flowing, save under pressure much greater than could possibly arise. Worse than that, there was no outlet whatever into the gearcase. The inner end of the bushing was flanged at *H* and neither that flange nor the seat *K* against which it bore was recessed in the slightest. This bearing was considerably cut, and a couple of paper liners had to be put under the lower half of the bushing. In order to give a sufficient passage for the oil, a groove *E* was chipped in the seat under the bushing, and to prevent the paper liners, which now separated the upper and lower grooves, from retarding the flow of oil, they were cut away at the grooves. Since this divided them into separate right and left portions, they were shellacked to the bushing to keep them from shifting, and the bushing itself was secured by brass dowel pins. An outlet was chipped in the seat at *G*. If this treatment had not been applied, the oil reaching the outer portion of the bearing could not have escaped except past the felt washer *B* and it would have accumulated metal particles and started cutting of the shaft and bushing. Small points of construction may make or mar the service that a car will render, and regardless of how well built it may be in general, if attention has not been paid to the apparently insignificant details there will be frequent occasion for repairs.

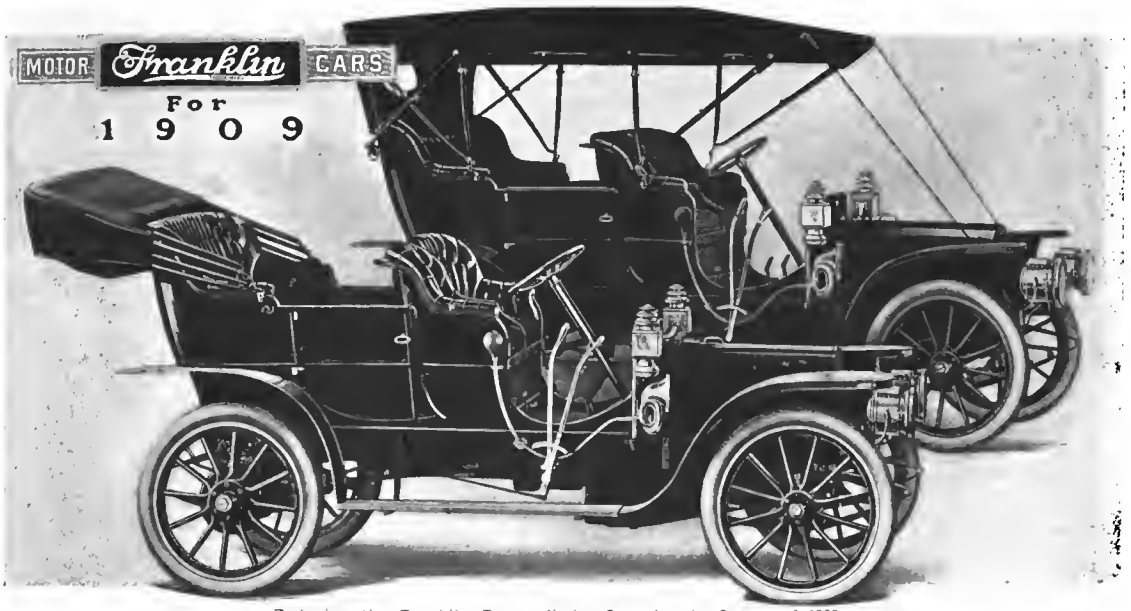


How the Ends Should Be Finished.





Cutting an Oil Groove.



Picturing the Franklin Four-cylinder Cars for the Season of 1909.

FRANKLIN cars for 1909 represent the culmination of six years of steady development, beginning in 1902 with a 7-horsepower runabout, which was the first air-cooled car to be placed on the market in this country. It certainly seems a far cry from the crude little machine of that time to the Franklin cars of the present day, but it was with that as a basis that the Franklins of 1909 have been developed, as the original principles which were embodied in this prototype of the air-cooled car in this country are still retained in the 1909 models, many of the features of which differ from those of its early predecessor merely in detailed refinement. Each succeeding year has not only marked improvement in the Franklin cars, but also has seen additions to the Franklin line, the present year being no exception. It now comprises two-seated runabouts equipped with hampers, or with single or double rumble seats, touring cars having a capacity of four, five or seven passengers, and closed cars of all types, suoh as broughams, landaulets, limousines, town cars and motor cabs.

Smallest Franklin Is Now 18 Horsepower.

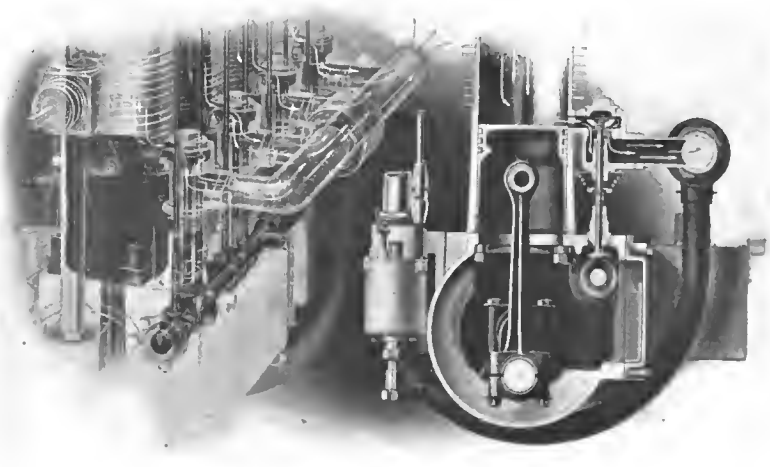
In past years the Franklin company has been turning out a very successful small car with an air-cooled motor rated at 12-horsepower, but for 1909 the smallest car which they will turn out will be known as Model G and will be rated at 18-horsepower. It has a four-cylinder air-cooled motor, the cylinder dimensions of which are 3⅜ by 4 inches. It is built on lines similar to the 28 and 42-horsepower motors, except that it is smaller and is a slower-running motor. With its added power and slightly reduced weight, Model G forms an extremely satisfactory four-passenger car, and really places it in a class by itself, when its price, passenger capacity and power are considered in the light of its capabilities.

Among the improvements made in this smallest representative of the Franklin family since the appearance of the 1908 models a year ago, probably the most apparent improvement is the use of 32-inch wheels instead of the 30-inch size formerly employed, this serving to increase the wheelbase by 1½ inches. Another change of note where the power-plant is concerned is the adoption of a Bosch high-tension magneto as the only means of ignition, in connection with a fixed point of firing. The increase in the wheelbase has also made an extension of the body possible, thus adding to the comfort and appearance of the car. In its fittings and appointments the standard body is somewhat similar to that used last season. But this model is also built witb a brougham body, making it a very serviceable vehicle for a doctor, or wherever a two-passenger closed vehicle is desired. It will also be furnished with a landaulet body similar in design to that used on the 28-horsepower car, but smaller in proportion. These bodies are built by recognized leaders in this line of work and are finely finished. The touring car, landaulet and brougham will be finished in royal blue and the runabouts with a red body and black running gear.

At the other end of the four-cylinder line of Franklins is Type D, a 28-horsepower car, which is the largest four-cylinder car turned out by the Franklin company. Its motor dimensions are 4¼ by 4 inches, and it is also equipped with a Bosch high-tension magncto as the sole source of ignition. As is the case with the smaller cars described, one of the most important changes where Type D is concerned is the adoption of 36-inch wheels instead of the 34-inch size employed during the past season. This gives a much better clearance, makes the car easier riding and adds to tbe life of the tire equipment, while also giving the car a much better appearance than with tbe smaller wheels. When built with a landaulet body, however, the 32-inch size wheels are employed, in order to make entrance to the car easier. In touring car and runabout styles this car is equipped with bodies patterned after the lines of the six-cylinder models, except that they are lighter and smaller to conform with thc lesser horsepower of the motor.

The six-cylinder model of the Franklin line, which is known

Type H, Franklin Six-cylinder Touring Car.



Views of the Working of the Franklin Auxiliary Exhaust.

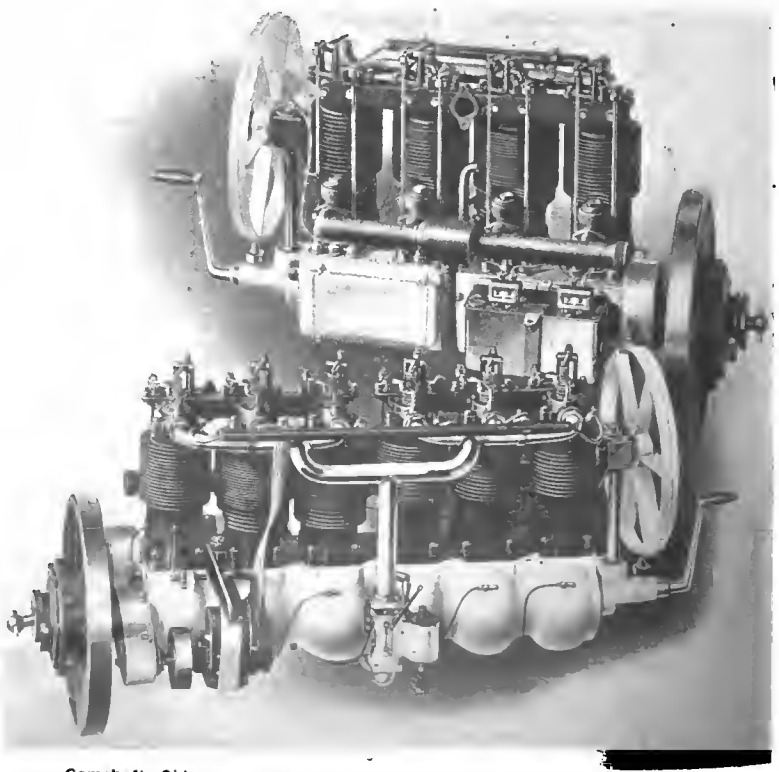
as Type H, is built in three different styles. First, as a seven-passenger touring car; second, a single or double rumble seat runabout, and third, as a seven-passenger limousine. This is the highest-powered Franklin car built and is rated at 42-horse-power. One of its features is a steering mechanism of the worm-gear type, which is made by the Franklin company in its own shops. Its design is such as to prevent any lost motion, which is of vital importance, besides being extremely easy to handle. Type H has a 127-inch wheelbase, which admits of a roomy and well-designed body, the extra seats being of the folding or Pullman reversible type, so arranged as to be readily removed, or closed up against the side of the body out of the way. For its power, this is undoubtedly one of the lightest cars on the market, tipping the scales, as it does, at less than 2,500 pounds, though listed at the latter figure.

As in the past, the power equipment of all the Franklin cars consists of four and six-cylinder air-cooled motors. In both design and construction they are similar to the Franklin motors for 1908, except in certain details, which thorough tests in the Franklin laboratories and practise have been found to increase the efficiency of the air-cooled engine. The governor, which has heretofore been considered necessary to the satisfactory working of this type of motor, is not used on any of this year's models, it having been demonstrated that with the present construction better results are obtained without it. This is due, to quite an extent, to the advances made in carbureter design during the past few years, this essential of the motor having been brought to a point where absolute uniformity of action and a perfect mixture under all conditions is assured. On the Model H there has been a slight change in the crankshaft, this being made stiffer and larger, thus adding materially to the smoothness of the engine's running.

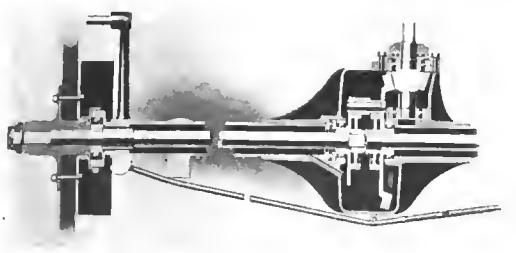
Through extensive hill-climbing tests carried on by the Franklin company it has been demonstrated that the results obtained are more or less affected by the position of the carbureter, and its location as regards a central position on the motor. A change has therefore been made by reversing the position of the carbureter, thus adding materially to the hill-climbing ability of this year's models. A demonstration of this was the work done by the Franklin cars in the A. A. A. tour, where the uniformity of their power at all times and under varying conditions was noticeable and favorably commented on by the press and contestants, showing the important results obtainable from slight changes.

A change from double or battery and magneto ignition to single high-tension magneto is a very interesting feature of the 1909 models, the Bosch system, which is used, representing the latest practice of the leading French and German manufacturers. On the Model H the magneto's action is controlled by an automatic governor with expanding arms pressing outward against the magneto's balance wheel, thus obviating the possibility of backkick. The method of wiring is also a point worthy of mention, the wires passing through a conduit so constructed as to make the chafing of wire and short circuiting impossible. The discarding of the timer has made possible several changes and the elimination of parts which slightly reduces the engine's weight, and naturally simplifies the ignition system, entirely eliminating, as it does, the possibility of timer troubles. This system was used on two of the Franklin cars in the A. A. A. tour and gave such perfect satisfaction as to merit its adoption on all of the 1909 models.

With the new engine construction the front cheek-piece can be removed without disturbing the camshaft, or the camshaft may be taken out without interfering with the cheek-piece. The starting crank in its attachment to the crankshaft has been made waterproof, and is held in place by a leather stirrup. The concentric valve and dome head cylinders are two features used exclusively on the Franklin motors, and while having made their



Camshaft Side of Four-cylinder and Off Side of Six-cylinder Motor.



The Franklin Rear Axle, Differential and Drive.

appearance on the 1908 models, have after a season's use shown themselves so important in the perfect working of the Franklin motor as to entitle them to be incorporated as features of the 1909 models without any changes.

The intake and exhaust valves are concentric, or, in other words, have the same center and take up the same space so far as using the top of the cylinder is concerned. This method of construction makes possible the using of valves having twice the area as where separate intake and exhaust valves are used. This form of valve and the dome-head cylinder fit each other, naturally leaving no corner for dead gases to lurk in, thus making the exhaust more complete, and therefore leaving greater room for a fresh charge. The area of the cylinder's inner surface through its shape is reduced, while the external or heat radiating surface remains the same. Therefore with this construction the cylinders are cooled quicker and more thoroughly than where the smaller valve and flat-top cylinders are used. Other advantages of the concentric valve and the dome-head cylinder are that the opening from the suction pipe to the cylinder is more direct. A greater amount of gas can therefore enter because of the decreased friction in the passage. The suction valve is also kept cooler by its not coming into direct contact with the cylinder head. Therefore, the gas expands less on entering the cylinder and a more concentrated charge can enter. There is less loss of heat in the cylinder, the heat expressing itself more completely in power. It also increases cooling ability by adding to the external surface of the cylinder and decreasing the internal surface. These large and small advantages of the concentric valve and dome-head cylinder are found to be effective at all speeds, but particularly at high speed on hard climbs or whenever the engine is taxed to its utmost.

The method of suspending the Type H engine is somewhat different from that used during the past season, the cross rails being made of angle steel, which also supports the magneto and oiler in a manner greatly reducing vibration and making removal or adjustment easy. A double heat accumulator, which is the method of securing warm air for the carbureter, is a new feature on the six-cylinder motor. This is accomplished by encircling the auxiliary pipe with a copper jacket and passing the heat so accumulated through the air intake pipe underneath the engine base to the carbureter. The copper case used on this motor is in addition to the regular steel warm-air collector used on all of the other Franklin engines. With the adoption of this device a considerable increase in the carbureter efficiency has been brought about by the perfect mixing of warm air in such volume as may be required by the varying conditions.

A change in the style of the oiler and method of carrying is such as would seem to add considerably to the convenience of filling the oiler. The Hancock positive gear-driven oiler of various feeds, depending on the size of the engine, is used on all models, being placed directly against the engine base where the oil is, through the warmth expelled from the engine, kept at all times in the proper condition for the most satisfactory lubrication. All the 1909 engines are equipped with a transverse slotted oil baffle plate, used in connection with the splash system of oiling, the pistons in their action forming a suction or natural pump drawing up the oil, and spraying it directly on the points required, causing a more even lubrication than through the ordinary splash system, which distributes the oil without regard to the exact points requiring lubrication and depending upon the operation of the engine for working the oil around.

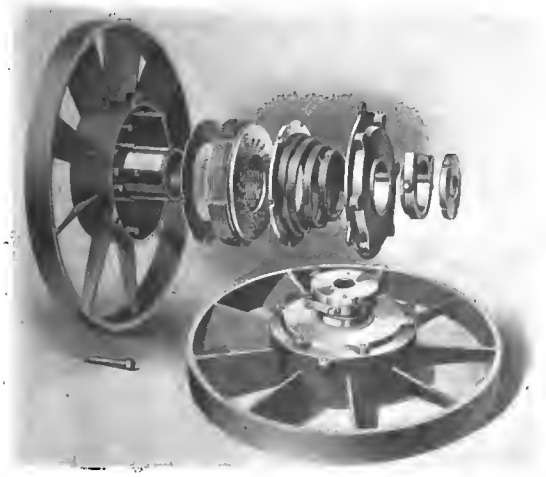
Franklin Steering Gear.

As has been their policy in the past, the Franklin Company use the lightest yet strongest materials procurable, which by thorough laboratory tests and actual practice have been found to be best adapted to air-cooled motor construction. The valve springs on all models are this year made of vanadium steel, which eliminates almost entirely the possibility of trouble from this source. As a test of these springs the Franklin cars in the A. A. A. tour were so equipped, and covered the entire tour with absolutely no trouble whatsoever. By a change in the position of the carbureter, the connectionless intake pipe has been altered, making a more direct passage for the gases.

The auxiliary exhaust is an exclusive feature on the Franklin, which, through its unique construction and position, these valves being at the base of the cylinder, dispel 71 per cent. of the burnt gases immediately on the completion of the power stroke, the remaining 29 per cent. passing out through the main exhaust, which, not being connected with the muffler, makes back pressure impossible and thus obviates the necessity of a muffler cut-off. These valves are mechanically operated by the camshaft in a similar manner to the regular exhaust valve.

The clutch is of the Franklin multiple disc type, the discs being made of phosphor bronze and steel alternated. The phosphor bronze discs are prevented from rotating by bolts, but are free to move laterally by friction gradually exerted through a spring. The discs are thus made to revolve, and, pressing out the oil, are brought into action without grabbing.

Two styles of change gear lever arrangement are used on the coming season's models, the selective type being used on all models except the 18-horsepower Model G, these being equipped with the self-finding gear shift. The selective type is so constructed as to be entirely free from lost motion, and is positive in its action. Whenever the lever is brought to a vertical posi- spring tension. The absence of the H-guiding plate used as a rule on the selective type transmission is noticeable. Operation between change gear lever and transmission is direct, all intermediate complications being entirely done away with. Through the arrangement of gears and operating levers it is possible to pass from one gear into another without disengaging the clutch.



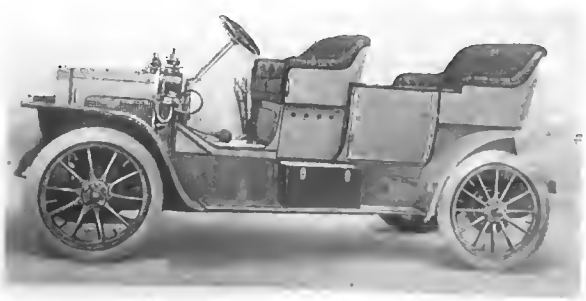
Essentials of the Franklin Multiple Disc Clutch.

The 1909 White Steam Cars

Model M, the 40-horsepower White Steamer for the Coming Season.

UNUSUAL interest centers each season in the plans of The White Company, because the White Steamer is a distinctively American machine, and the annual announcements dealing with the development of its characteristic features are certain to be something more than echoes of the doings of foreign designers. Furthermore, the announcements of The White Company are of interest, not only to the automobile public, but also to engineers all over the world, because the power plant of the White car is known to them as the most economical and efficient steam power plant ever devised, and the White generator as being radically unlike any other type of steam-making device. As in 1907 and 1908, the White steam car for 1909 will be built in two distinct models, which, while differing from each other widely in power, in size, and in price, resemble each other in their general lines of construction. The horsepower ratings of the two models are based on the actual power delivered at the rear wheels, not the power delivered at the engine.

The larger of the new White cars will be known as the Model M, and will be the successor of the Model K of the present season. The Model M is rated at 40-horsepower and sells for $4,000, with the usual equipment of acetylene headlights and tank, oil lamps, horn and tool kit. The wheelbase is 122 inches; the front tires, 36 by 4 inches, and the rear tires 36 by 5 inches. The car is regularly fitted with a straight-line seven-passenger body. The engine is compound, of new design, described in full below. The high-pressure cylinder is of 3½-inch bore; the low-pressure cylinder of 6-inch bore, and the stroke is 4½ inches. The frame is of armored wood, the reinforcing plates of nickel steel being fastened on both sides of the wooden sills. The front axle is of a tubular type; the front springs are 44 inches long and 2½ inches wide; the rear springs 55 inches long and 2½ inches wide. Both the foot-brake and the hand-brake act on drums on the rear wheels, the former being of the expanding type and the latter of the contracting type.



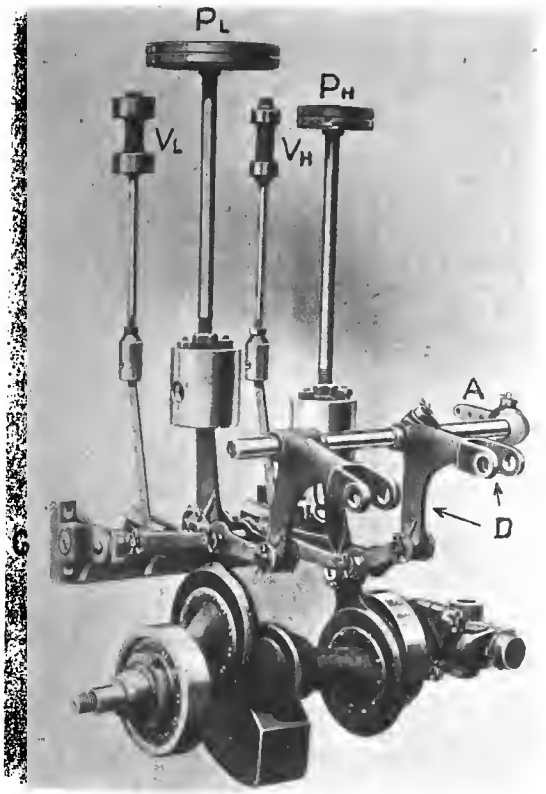
Model O is a 20-horsepower Replica of the Larger White.

The smaller of the new White cars will be known as the Model O. This car may be described more appropriately as a smaller edition of the new Model M, rather than as a successor of any previous model. The Model O is rated at 20 horsepower and sells for $2,000. The wheelbase is 104 inches and the tires, both front and rear, are 32 by 3½ inches. The car is regularly fitted with a straight-line five-passenger body. The engine, except as regards size, is identical with that in the Model M. The high-pressure cylinder is of 2½-inch bore, the low-pressure cylinder is 4¼-inch bore; the stroke is 3 inches. The frame is of heat-treated pressed steel. The front axle is a one-piece forging of I-beam cross-section. The front springs are 37 inches long and 1¾ inches wide; the rear springs are 45 inches long and 1¾ inches wide. Both the foot-brake and the hand-brake act on drums on the rear wheels, the same as on the Model M. As in the larger car, the water tank is placed under the footboards and the fuel tank is in the rear.

The White Engine Improvements.

The principal mechanical change in the new cars, as compared with previous White models, is in the engine. As previously mentioned, the engines in the two new models differ only as regards dimensions, and, therefore, the following description applies to both models. The new engine construction has been undergoing a thorough trying-out for two years, and both the Model M engine and the Model O engine have been subjected to tests of over 30,000 miles of usage, and, therefore, may be regarded as thoroughly seasoned products. The change in the engine may be summarized as follows: In the place of one standard type of valve mechanism another standard type of valve mechanism is used. In former years the engines used in the White cars were fitted with the Stephenson link motion, which was actuated by eccentrics on the crankshaft, as were also the pumps. The new White engines are fitted with the Joy direct valve action, which is operated from the connecting rods; and the pumps, all of which are located on the left-hand side of the engine, are driven directly from rocker arms, attached to the levers of the valve-operating mechanism.

This new construction permits of a great simplification of the engine. The number of parts is reduced almost to a half of those formerly necessary, considerable weight is saved, all eccentrics are done away with and the cylinders are brought close together, permitting the use of a short one-piece crankshaft.



Complete Working Parts of White Compound Engine.

PH, high-pressure piston; PL, low-pressure piston; VH, high-pressure valve; VL, low-pressure valve; G, valve guide, by tilting which the engine is reversed; A, rocker-arm which drives the oiler; D, rocker-arms which drive the pumps.

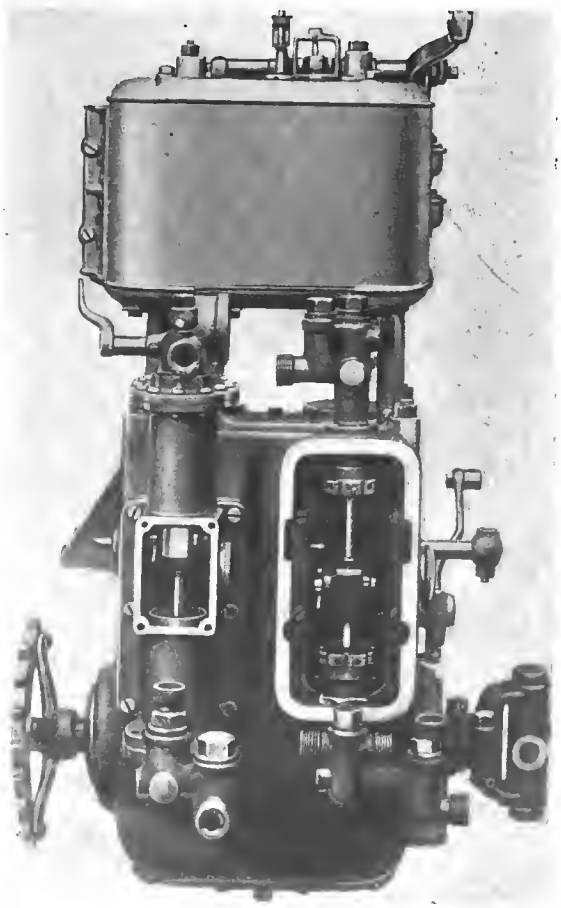
The new crankshaft is a one-piece forging of tool steel, and, as shown in Fig. 2, there are but two mainbearings to the crankshaft. This is a most advantageous construction, because when three or more bearings are used in any shaft there is always a possibility that they may get out of alignment. The main bearings are of the annular type and may be removed from the crankshaft by taking off the lock nuts and lock washers, as shown in Fig. 2. The two main bearings and the two connecting rod bearings are fitted with ball separators, and the balls are of extra large size. The connecting rods are one-piece forgings.

In Fig. 3 are shown all the working parts of the new White engine, the pistons, crossheads, connecting rods, crank, valve mechanism and pump levers. It will be seen that both the high-pressure valve and the low-pressure valve are piston valves. Steam is admitted through the center of the valve and exhausts at the ends. The pressure on the valve stuffing-boxes is thus reduced to that of the exhaust from the respective cylinders. The small arm, *A*, on the end of the pump rockershaft is connected by means of a rod to a ratchet device which drives the oiler placed on the dashboard. The sprocket on the forward end of the crankshaft is connected by chain to the fanshaft, and the ratio of the sprockets is such that the latter runs faster than the engine. The fan itself is not rigidly fastened to the shaft, but is connected by an ingenious ratchet device which permits the fan to run ahead of the shaft. Therefore, when the engine is stopped or slowed down the fan continues to run as long as its momentum persists, thus preventing any back-lash in the chain. The fanshaft housing is held in place by eccentrics and the tension of the chain may be readily altered by turning these eccentrics. As a good draft of air between the condenser tubes is an important element in securing good condensation, which means good economy in water consumption, these improvements in driving the fan are of no little importance in the running of the White cars.

Accessibility Is a Prominent Feature.

The crankcase of the engine is made in one piece, but ready access may be had to all the parts within by the removal of the side and bottom plates, and the crankshaft may be taken out through either end. The new engine permits of a pleasing and symmetrical arrangement of the necessary piping, and everything under the bonnet is easily accessible. Stuffing-boxes are fitted to the upper end of the slides in which the crossheads travel, so that no oil may be splattered out of the crankcase. There are the most thorough provisions for keeping everything within the crankcase well lubricated. The cylinders are provided with relief valves for getting rid of any water which may be in the cylinders when starting the engine "cold." These valves are opened momentarily by a small lever on the dash, before admitting steam to the engine, and the entering steam quickly and effectually removes the water.

The engine is so adjusted that it runs normally on the "cut-off," that is, the admission of the steam to each cylinder is stopped before the end of the stroke and the steam then works expansively for the balance of the stroke. In starting the engine, the pushing of the "simpling" pedal allows the engine to take steam during the full stroke. There is also a "cut-off" pedal which, when passed, produces the same results. This "cut-off" pedal is used only when slow, hard pulling is required, as in climbing particularly steep grades or running over very



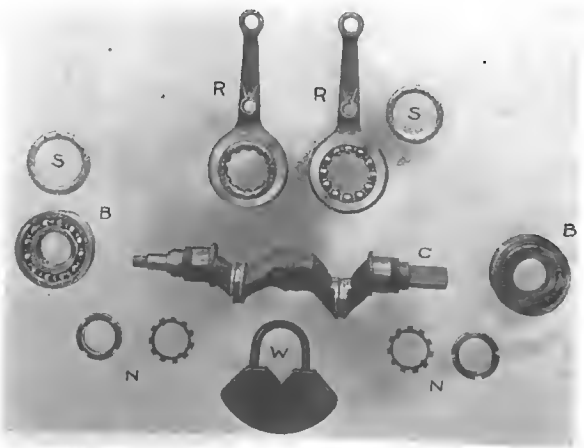
The White Engine Ready to Place on the Chassis.

Steam Generator of the White Cars.

heavy roads. An interesting feature of the Joy valve mechanism is that, when the "cut-off" is changed, the "lead" of the valves is unchanged and the engine thus runs more smoothly on "cut-off" than was possible with the Stephenson valves. The engine is reversed and the "cut-off" is changed by simply changing the tilt of the guide, *G*, as shown. The engine is supported on two cross-members of the frame, which are so placed that the entire weight of the engine is behind the front axle. The engine is so hung that the driving shaft is perfectly horizontal, and, as there is neither clutch nor transmission gear on the White, the drive is direct and positive from the engine through the driving shaft to the rear axle.

Unique System of Steam Generation.

The exhaust pipe from the engine to the condenser is located on the right-hand side. Within this exhaust pipe there is a coil of piping, through which the water from the pumps circulates on its way to the generator. This arrangement thus constitutes a neat and compact feed-water heater, which performs the double function of heating the feed-water and of aiding the process of condensation. The generator is of the same construction as in former years. For those who are not familiar with this device, it may be said that the White generator, shown above, consists simply of a series of coils of steel tubing, placed one above the other, and connected in series. If the whole were to be unwound and straightened out, the generator would be seen to be made of a single long piece of tubing. In operation, the water is pumped into the upper coil and steam issues from the lower coil. There is but a very small quantity of water in the generator at any given moment (in the larger car the total capacity of the generator is less than one-third of a cubic foot), but the process of making steam is so rapid that steam is always available in the quantity which the running



Crankshaft, Connecting Rods and other Essentials.

conditions may make necessary. In both the Model Model O cars the generator tubing is of ½-inch interna eter, but the length of tubing used differs, of course.

The system of regulation, whereby the temperature ar sure of the steam are kept constant without in any way e or requiring the attention of the operator, is the same new models as in the 1908 machines. To describe bri scheme of regulation, the supply of water to the genera the supply of fuel to the burner are so controlled as al be in perfect balance with each other. As soon as th pressure rises appreciably above the normal working p both supplies are at once cut off. As soon as the pressur at all below the normal both water and fuel are supplied portionate quantities. The devices which regulate the fu ply and the water supply are positive in their action, no delicate parts, and depend for their operation only o perature and pressure, forces which are absolute in thei ing. External atmospheric or climatic conditions in n influence the action of the regulating devices. In conclu may be stated that those who know the White car will h difficulty in recognizing the new models at a glance, a exhibit the characteristic external features which dist the cars of this make—now entering upon their ninth yea

A NEW METHOD OF AUTOGENOUS WELD

Of unusual interest to the automobile trade is the new of autogenous welding developed by A. K. Schaap, 344 C land street, Brooklyn, N. Y., and recently demonstrated ir for the first time. The improved form of blowpipe i by Mr. Schaap makes it possible to obtain temperatures o 4,500 degrees, using only an air blast and a small amo city gas. Even higher temperatures may be obtained use of acetylene.

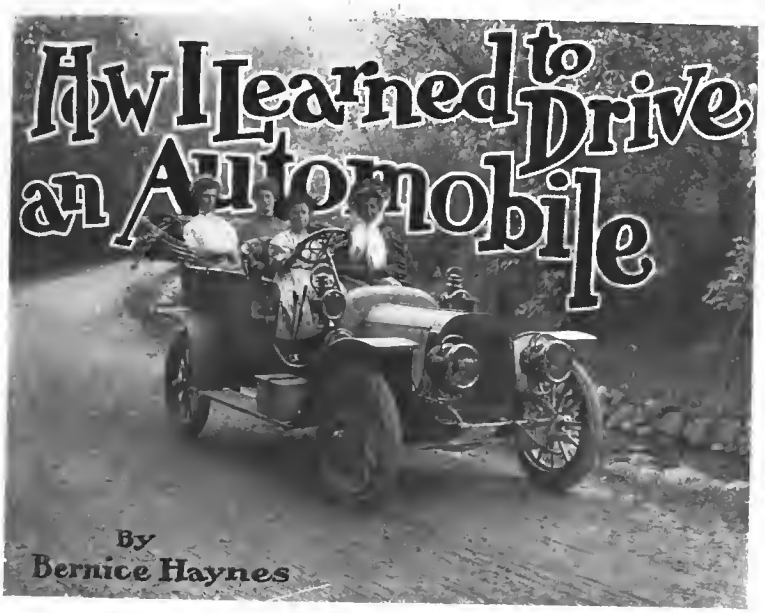
The peculiarity of the blowpipe is that it employs two s of air, one under a very light pressure, the other under 30 pounds; these mingle with the gas, and it is claime the nitrogen of the air is thrown to the outside of the leaving almost pure oxygen in the core. In this way can be obtained almost equal to those from blowpipes chemically pure oxygen in tanks, without the expense. brass, and even aluminum can be welded by this proce

An automobile rear axle was exhibited, in which the alu flange forming the side of the differential casing hac broken off and welded back in place, making the piece ently as good as new.

TASMANIA OFFERS A MARKET FOR AUT

The tariff on automobiles imported into the Con wealth of Australia has been materially reduced, and a ing to reports from Consul Henry D. Baker, of H Tasmania, a considerable field for American manufac has been opened up in that island. The duty formerl 20 per cent. ad valorem, but the new tariff has change to 35 per cent. on the body and 5 per cent. on the cl which makes a reduction on the whole car of, roughly half. Tasmania is a country of wonderful scenery and exceptionally good for this part of the world. About tourists from the mainland of Australia visited the during the last season and many of them brought thei with them. Automobilists here favor low-powered ca between 10 and 18 horsepower, preferably with four-cy engines. Most of those in use are of French or E make; unfortunately there is a prejudice against Am cars, owing to the fact that the first ones imported cheap runabouts which met with poor success on the roads of the island and were difficult to repair.

Nevertheless a good market could easily be made for American automobiles if the manufacturers were w to establish direct agencies in Hobart or even in Melbo Cars should have metric sizes of rims and spark plugs.



Miss Bernice Haynes at the Wheel—Mrs. Elwood Haynes Alongside.

FATHER has owned an automobile, or "engine buggy," as I called it, ever since I can remember. He built the first one before I was two years old, and I have ridden in them whenever I wanted to do so since then. I have never driven the first automobile father made, because I was too small when we used it. It had been standing in the factory until the Spring automobile parade in New York, in which father drove it.

I have always wanted to learn to drive an automobile. When I was eight years old I guided a two-cylinder runabout four miles into the country and father drove it back. That satisfied me for the rest of that Summer, but the next year I wanted to go farther, or to go alone. Father finally gave me permission to drive arount the block alone. I did this a great many times, always going on the slowest speed. I usually took two or three of the neighbor's children with me. Some of the neighbors would not let their children go with me, but they might as well have consented, as we did not have any accidents.

One evening I wanted to drive a car around the block. The automobile, a two-cylinder runabout, was standing in the driveway, and father said that I might take it if I would back it out into the street. I started the engine—this was about the first time I had ever done that—and I backed the automobile out of the yard. My grandmother was an observer, and she said that I would certainly be killed if I started out at that age to drive an antomobile.

One evening, just about dark, we were out riding and ran out of gasoline about three-quarters of a mile from home. We were not far from the trolley line, so father went to the factory on a street car and brought a can of gasoline from the factory in another automobile. We did not know what to do with two automobiles. I suggested that I could take one of them home. Father and mother discussed this plan for a short time and finally agreed to allow me to drive the one home in which we had been riding. Father, mother, and my brother took the other car and drove home on the slow speed. I kept very close to them all of the way, and we accomplished the run without an accident. I thought that after I had done as wonderful a thing as to drive an automobile for three-quarters of a mile without any accidents, I certainly should be allowed to do it again, but father said that I must not, because if the engine stopped I could not start it again.

About a year after this, when I was eleven years old, father had to go away. He took a car to the station, which is about a mile and a half from the factory. As there was no one else at the station who could take the automobile to the factory, father let me take it. This was the first time I drove alone on the middle speed.

I was not allowed to drive alone very frequently until last Autumn. Mother suggested that we might take a ride on some nice day and father said that I might take mother for a ride whenever she wanted to go.

The second drive I took with mother last Autumn we decided that we wanted to gather some walnuts. Father said that we must not go directly to the walnut grove, as there was a bad hill to descend on the way. We went about a mile farther than the grove, and drove back to it on another road, thus avoiding the bad hill. I had to let the engine run all of the time we were gathering walnuts, as we could not start it again. On the way back we went up the bad hill.

One afternoon this Spring I was driving in the country and noticed that the engine was working badly. It finally stopped. I thought that the battery must be out, so I looked under the rear seat and found another battery. We examined the one that was connected and connected the other one the same way. It worked well after that.

We have taken a great many other drives of from 20 to 30 miles in length. I usually go between 18 and 20 miles an hour.

Two kinds of gears are used on automobiles—the clutch gear and the sliding gear. The clutch gear is operated by a lever which releases the clutch when removed from a notch and engages it when placed in a notch. In this way there is no possibility of having two sets of gears in operation at the asme time. The sliding gear is used on most four-cylinder cars. It has a short revolving shaft fastened to the engine. On the end of this shaft is a cogwheel which communicates the power to another shaft by a larger wheel. The power is then transferred to the driving shaft by a small wheel on the former to a large wheel on the latter when slow speed is desired. The intermediate speed is secured by bringing two wheels of about the same size into contact. The high gear is in use when the driving shaft is locked to the engine shaft.

When operating a sliding gear, the clutch is released with the foot, and the lever is placed in the position for the desired speed. The clutch should be let in gradually or the gears will become damaged. It is usually best to start on the slow gear, or the engine may be stopped. With some practice and a high-powered engine, it is possibe to start easily on the high gear. When a lower speed is desired the engine should be allowed to run at a speed corresponding to the desired speed of the car. The "Haynes," the only car I have ever driven, is equipped with a patented device, so that a lower speed may be thrown in at will and will take hold when the car has slowed down enough.

The spark should usually be placed below center after the engine is started. It must always be quite a distance above center when the engine is started, or it will explode too soon, and it may result in injury to the operator.

The throttle should be opened when starting the car. It is usually best to drive as much as possible on the high gear and regulate the speed of the car with the throttle.

It is always advisable to turn all corners slowly, and to drive slowly on any wet place where the car would be likely to skid.

Small machines are often steered with levers. This is a very good way for small cars, but it is not best for the large cars, as the lever communicates all jolts of the wheel to the hands. Wheels are used on large cars and they are much more serviceable than levers.

When meeting a team on the road, it is best to go slowly, but

not to stop unless the occupants of the vehicle demand it. One should turn out well to the right, far enough in front of the team so that the driver of the carriage may have plenty of time to get on the opposite side of the road and thus avoid any confusion. When passing a team from the rear, it is advisable after giving the occupants of the carriage a warning, to pass the vehicle slowly. With a high-powered machine this may be done with the high gear with very little noise. If the gear has to be changed, it should be done before reaching the horse, as the noise made by changing gears might frighten the animal.

When driving on crowded streets it is best to drive on the slow speed and be ready to stop instantly. A warning should be sounded at every corner.

ALL KINDS OF FUEL WILL BE USED.

PARIS, Aug. 20.—The use of all kinds of fuel, economy in its use, and regularity of running will form the basis of the taxicab and light industrial vehicle contest to be held in and around Paris from October 1 to 10. On the first day out all competitors must run on gasoline; on the second and third days 50 per cent. carbuated alcohol is obligatory; during the fourth and fifth days Lepretre's "White Spirit" must be used, and on the last three days the choice of fuel is left to the competitors. Fuel consumption will be the base of the classification, the calcnlations being made on a price basis.

Two main classes are provided for in the competition, each one of which is divided into three or four sub-classes. Thus, in the taxicab competition, the first class is for six-passenger hotel omnibuses with baggage capacity; the second for four-seated taxicabs, and the third for the smallest two-passenger cabs carrying no baggage. In the delivery vehicle class there are four divisions, for motorcycles with carrier attached; vans with a load capacity of 440 pounds; larger vehicles carrying up to 1,300 pounds; and, finally, for covered vehicles capable of taking a load between 1,300 and 2,640 pounds.

During the seven days' running, most of which will be around Paris, a schedule varying from 5 to 18 miles an hour must be adhered to, with numerous controls, no speeding between controls to make up for lost time being allowed. Failure to make a control on time entails disqualification. There will be a hill climbing competition during the test, and a speed test with standing start over a distance of 300 meters. These, however, do not figure for the classification, which is made entirely on the following formula, $\frac{TC}{PxD}$, in which T is the number of hours' running; C the fuel consumption in francs; P the useful load in kilograms, and D the number of kilometers covered.

All vehicles will be placed in a closed park at the end of each day's run, one hour being allowed for oiling, filling tanks and cleaning. No repairs or adjustments must be undertaken, officers being appointed to see that this rule is observed. Whatever repairs are necessary must be done by the team on the cars and by the tools and parts they carry with them, outside help of any nature whatever being rigorously refused.

PROSPECTS FOR AUTO TRADE IN ALGERIA.

American automobile manufacturers who wish to increase their export trade would do well to consider Algeria, according to reports from Consul James Johnston, of Algiers. Automobiles are already used by wine and oil merchants who have to travel in districts as yet inaccessible by railway. The indications are that a permanent and profitable market could be created here by an American manufacturer willing to go to the expense of properly introducing his cars. A direct agency should be established, with literature in French, and demonstrating cars on the floor. No sales can be expected through catalogues alone. The duty on automobiles imported from the United States is 60 francs per 100 kilos ($5.27 per 100 pounds) on cars weighing over 125 kilos.

One of the Brush Cars Used by Washington Post-Office.

WASHINGTON POST-OFFICE TO USE AUTOS.

WASHINGTON, D. C., Aug. 22.—The Brush-Nichols Company, agents for the Brush, have entered into a year's contract with the postal authorities of this city for furnishing four Brush package wagons to be used in collecting mail in the outlying sections of the city, as well as in the business centers. The company has opened a garage in the rear of the city post-office, where the cars will be kept. The contract calls for the furnishing of the cars, together with competent operators, and it has been decided to work two shifts of men in driving them, the vehicles being in service from early morning until after midnight each day. Three cars will be used in the service regularly, while a fourth will be held in reserve.

The Brush cars have since been supplemented by two single-cylinder Cadillacs, provided and operated by the letter carriers under an allowance secured from the Post-Office Department.

It has been announced that the six cars in operation save the service of eight men and twelve horses.

This contract is remarkable in that the Post-Office does not buy the cars outright, but only rents them; the cars are taken care of and the drivers furnished by the agency. All parties concerned are benefited by this arrangement, which is in line with the modern tendency toward specialization. It will undoubtedly be found most advantageous in all cases where a company needs but few cars and cannot afford to maintain a garage department to care for them. The success in operation of the Washington equipment will be closely watched, and its economy over horses will doubtless lead to the adoption of a similar service in many other large cities where the use of horses and wagons is now responsible for much delay.

The King of Spain in Renault Which He Cont

EIGHT-CYLINDER ENGINE OF THE DIXIE II

IN view of the remarkable performance of the *Dixie II* in defeating boats of nearly double the power in the race for the Harmsworth trophy, and her later feat of covering a 30-mile course at the Thousand Islands in 58 minutes, thereby winning the final contest for the Gold Challenge Cup, some particulars of her engine are naturally of interest.

Speaking in general terms, the engine is of the Antoinette type, carrying 8 cylinders arranged in two sets at an angle of 90 degrees from each other, with pistons working in pairs on a four-throw crankshaft of general form, similar to that used in four-cylinder engines. This type of engine was chosen for the saving in weight of crankshaft and crankcase which it permits. In details, however, the engine differs considerably from that of its famous prototype. The engines against which it competed were of the ordinary automobile type, but the engine of the *Dixie II* may fairly be said, for the large cylinder dimensions and the special purpose for which it was designed, to mark an advance over the automobile type. The cylinders are

Engine of Dixie II, Winner of Harmsworth Trophy.

7 1-4-inch bore and stroke, the extremely short stroke common in automobile construction being avoided because it would mean an undesirable increase in the revolutions per minute. Automobile engines of this size have been found to give considerable difficulty in the matter of keeping the valves and piston heads cool, and this fact has necessitated using lower compressions than are customary in smaller sizes, with a resulting sacrifice in power. To a large extent this over-heating is avoided in the engine of the *Dixie II* by the use of auxiliary exhaust ports uncovered by the pistons. A special set of cams operates poppet valves controlling these ports.

The cylinders are cast separately, and the inlet and main exhaust valves open directly into the heads. The water jackets are cast in skeleton only, and are closed in by brass plates screwed over gaskets. A single camshaft operates all the valves. The cams are under cut, and the inlet valves are pulled open against their own spring tension by strong springs, so that one cam operates both valves of each cylinder. A separate shaft carries the cams for make and break ignition.

The crankcase is a manganese bronze casting, and the oil pan, as usual, is aluminum. The pistons, wrist pins and connecting rods are of quite extraordinary lightness, and the last named are hand forged of alloy steel. To secure adequate bearing surfaces at the crank end of the connecting rods without unduly elongating the shaft was a difficult problem, whose solution was found in the novel expedient of giving one connecting rod of each pair a bearing over the entire crankpin, and so forming the outside of the big end of that rod as to afford a bearing for the other rod. In other words, one rod works on the pin and the other rod works on the big end of the first rod. Naturally this implied a special design for four of the rods, but the two sets of rods are nevertheless alike in weight.

Lubrication is effected by a pump which takes oil from a well at the after end of the crankcase and forces it through a filter from which the main bearings and the pistons are supplied. Splash is not depended on, and in fact the cranks do not dip into the oil. Each of the main bearing bushings has a central annular grove to which oil is fed, and this groove registers with a hole drilled in the shaft. The shaft and cranks are bored hollow and of rather large diameter, and the ends of the holes are closed, thus forming oil chambers which, under normal conditions, are constantly filled with oil from the main bearings. Passages drilled in the cranks carry the oil to the crank pins, and from these it escapes to the crank pin bearings. As an illustration of the extreme refinement necessary to keep the engine within the required limit of weight, it may be remarked that the crank pin bearings are lined with white metal only 1-32 of an inch thick, these linings being cast in the rods and bored to size.

Reversal is affected by planetary gearing carried in a frame bolted to the after end of the crankcase. A friction clutch starts the propeller in the forward direction, and positive dogs take the load when the clutch has nearly ceased to slip. The cylinders are cooled by eight separate plunger pumps, which deliver water through separate pipes so that each cylinder is sure of getting its share.

The flywheel is a manganese bronze casting, bolted and keyed to a large flange at the forward end of the crankshaft. The carbureter is of Crane & Whitman design. It has no auxiliary air valve, this being considered undesirable for racing purposes.

The engine weighs complete about 2,200 pounds, including reversing gears and pumps. It is capable of developing approximately one horsepower for each ten pounds weight, and its maximum speed is somewhere between 850 and 900 r.p.m.

PARIS-TO-THE-SEA HAS SMALL ENTRY.

PARIS, Aug. 20.—Paris-to-the-Sea, the annual cruise and race which the capital has put on foot for a number of years, with varying success, is this year almost entirely an outing of amateur motorboat men, the trade element being conspicuously absent. When the start took place at Maisons-Laffitte, the Parisian suburb, the fleet did not number a dozen, and among them was not a single really fast boat. *Delahaye-Nautilus,* one of the Monaco champions, gave a demonstration of speed and was followed by the *Fauber,* the curious hydroplane built and owned by W. H. Fauber, formerly of Chicago, but neither boat went with the fleet, and it is doubtful if they will go later to Havre and Trouville for the races.

The cruise, which lasts eight days, will take the boats down the River Seine by easy stages until Havre is reached, when racing commences.

THE AUTOMOBILE

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THE LIGHT CAR COMING INTO ITS OWN.

In histories of the automobile industry written from the viewpoint of future decades, the year 1908 will undoubtedly stand forth as one of the most noteworthy periods of transition. Not that there have been any important inventions or revolutionizing discoveries, which were formerly so freely predicted—far from it. The science of automobile design, as far as its fundamental principles are concerned, is as fixed and definite as any other branch of engineering. But now, for the first time, we have realized and made full use of the immense progress in refinement and detail.

Hitherto the large car has been the one and highest ambition of every automobile manufacturer; no one seemed to regard himself as firmly established in the industry until he could exhibit a model of from 40 to 60 horsepower. The oldest makers, it is true, worked their way up more or less gradually from the small car; later comers built small cars for one year, at most, and then jumped into the large car class.

Some critics have called this movement a mere craze for speed and power. But that is hardly just; these men saw the boundless possibilities of the automobile, and were striving to realize them in the easiest and most obvious way. They wished to build a car which could go anywhere—climb mountains, plow through mud hub-deep, cross trackless deserts—and they succeeded. Their cars have strength, power, and reliability, but they are too expensive, except for buyers who want cars *de luxe*.

But what was a problem solved itself, as problems often do. While engaged with other and apparently more important questions in large car construction, designers had gradually been improving the efficiency. Every year the same cylinder bore, the same gallon of gasoline, has been made capable of doing us more work. Now, all at once, they have realized that they can build a car of twenty horsepower with all the ability of the earlier forties and sixties. Thus, in the development of the once scorned and neglected light car, has appeared the true solution.

Manufacturers and buyers alike are now beginning to understand that high power, in itself, so far from being an advantage, is in reality a drawback. It is costly, wasteful, and dangerous in the hands of inexperienced or reckless persons. Only the ability which it confers is desirable, and now we can obtain the same ability with half the power and half the expense. Four cylinders of say four inches bore, will carry five persons everywhere they wish to go, quickly, surely, and comfortably, with a bill for gasoline, oil, and tires that is astonishingly low.

These light cars are not merely reduced-size copies of larger models. Their designers have taken full advantage of every improvement in large car construction, and have seized upon several ideas, such as block-cylinder casting and unit construction, which, though of uncertain origin, seemed peculiarly adapted to their ends; but they have also shown remarkable ingenuity and resource in many less noticeable places. Add to this a factory organization and equipment scarcely thought possible a few years ago, and the modern light car appears. Next season it will assume its proper position as a most important class.

* * *

WHAT THE LONG ISLAND PARKWAY MEANS.

The building of the Long Island Motor Parkway is of great significance to the American automobile industry. In its influence, rather than in the results accruing from its direct use, will be found a large part of its value, for if a special highway for automobiles can be built and maintained in one part of the country, there is no reason why similar enterprises cannot be set afoot wherever the population is such as to warrant it, and there are not a few parts of the United States where the automobiling fraternity is sufficiently numerous and progressive to support such an undertaking.

Not the least part of its value will be found in the demonstration that it will afford of the fact that the dustless highway is a practical possibility of the near future, and its influence in this respect should not only prove of value to others backing similar enterprises, but to the course of highway improvement in this country as a whole, for the dustless road is as much of a necessity to horse traffic as it is to the automobile. Since there will be no horse-drawn vehicles on this parkway, it will be possible to see just what effect the surface of the specially constructed highway will have upon tires and also what effect tires will have upon the road. Considered in whatever light it may be taken, the parkway is bound to be productive of valuable and lasting results. Its construction shows that, the automobile having developed to a high standard, the creation of highways on a par with it is in order.

A. A. A. GRANTS A NUMBER OF SANCTIONS.

New York, Aug. 25.—At a meeting of the Sanction Committee of the Racing Board of the American Automobile Association, held at the national headquarters, 471 Fifth avenue, to-day, applications for sanctions for various events to be held in the near future were granted to six different organizations affiliated with the A. A. A., the applicants having complied in every way with the rules of the Racing Board. The sanctions granted were as follows:

. Automobile Club of Minneapolis, hill-climb; Automobile Club of Minneapolis and Automobile Club of St. Paul, joint auspices, race meet; San Antonio (Tex.) Automobile Club, 12-hour endurance contest; Wildwood (N. J.) Motor Club, speed trials; Sonoma County Automobile Club (Santo Rosa, Cal.), race meet; Richmond (Va.) Automobile Club, race meet.

Reservation dates were also requested for sanctioned events to be held in the near future at Poughkeepsie, N. Y., Hot Springs, Ark., and Washington, D. C.

TWO MORE VANDERBILT CUP ENTRIES.

It was stated from an authoritative source on Wednesday that an entry of a Thomas car for the Vanderbilt race, to be held over the Long Island Motor Parkway, October 24 next, had been mailed direct from the offices of the E. R. Thomas Motor Company, in Buffalo, to Jefferson De Mont Thompson, chairman of the Vanderbilt Cup Commission.

In addition to this entry, word comes from Trenton that the Roebling car, now under construction there by W. A. Roebling, would also be entered. This is a four-cylinder machine, the motor of which has developed 140 horsepower under tests. It is expected to be ready for the road by September 15. An entry of a Knox car is also looked for. The first entries close Tuesday next, September 1, on which date W. K. Vanderbilt, Jr., is expected to return from abroad.

AUTOMOBILE NEWS MADE IN GERMANY.

Berlin, Aug. 20.—There is much indignation in Germany at the trick played by the Italians on the trade and press of the rest of Europe. Reports from Turin declared that the victorious Mercedes Grand Prix team had been entered for the Bologna meet, and on hearing this several other big firms sent in entries, only to find that the whole thing was a hoax.

It will be remembered that Belgium gave up its Ardennes race this season in order not to conflict with the Bologna meet, and was to receive the benefit of a reciprocatory action on the part of the Italian A. C. next year, when Belgium was to be the only country to hold a big event after the Grand Prix.

PRESIDENT RECEIVES THE THOMAS CREW

The Thomas car which won the New York to Paris race is en route to Buffalo on a demonstration trip, in charge of George Schuster and George Miller, its victorious crew. Joseph Tracy is accompanying the outfit and will make a report of the conditions and running of the car on the trip.

Last Friday the car, its crew, and Harry S. Houpt, its entrant, were received by President Roosevelt at Oyster Bay. The President was much interested in the story of the trip and congratulated its crew on their victory, declaring that it added another leaf to the laurels America won at the Olympic games.

AMERICAN EXHIBITORS IN PARIS SHOW.

Paris, Aug. 20.—Entries for the eleventh annual Paris Salons, to be held in the Grand Palais during November and December, closed on Saturday, August 15, the total of the demands for space being quite equal to previous years. In addition to the numerous makers of machine tools who show their products through agents, America will be directly represented by Ford, Cadillac, Buick, Goodrich tires and Rushmore searchlights.

THAT UNSANCTIONED BRIGHTON MEET.

The E. R. Thomas Motor Company, of Buffalo, has plainly indicated that it does not approve of the proposed unsanctioned race meet to be held at the Brighton Beach racetrack Friday and Saturday, September 11 and 12, under the auspices of the recently formed Motor Racing Association. The position of the Thomas company is set forth in the following letter, written by E. R. Thomas to the American Automobile Association, with authority to publish it:

"All the Thomas cars entered in the 24-hour race to be held at Brighton Beach, September 17th, have been withdrawn for the reason that the E. R. Thomas Motor Company cannot permit any of its cars, over which it has the slightest control, to participate in a race which has not received the sanction of the American Automobile Association, as it would disqualify our cars and our drivers from all events outside of the metropolitan district.

"We believe that racing must be controlled by an authoritative body, and as the A. A. A. has been controlling racing for some years, we see no reason why the conditions should change. In assuming this position, I feel as if we voice the sentiment of the largest majority of manufacturers, without whose assistance races cannot be successfully run.

"Under instructions, H. S. Houpt has withdrawn his entries in the Brighton Beach race."

(Signed) Edwin Ross Thomas,
President E. R. Thomas Motor Co.

Nevertheless, it is said that while H. S. Houpt has not yet entered a car, he will do so if arrangements can be made to obtain one. It is now understood that a total of 14 cars has been guaranteed, two each from the following firms: Wyckoff, Church & Partridge, Lozier Motor Company, Fiat Import Company, Renault Frères Selling Branch, Palmer & Singer, C. M. Hamilton, representing Isotta, and L. C. Moskovics, Allen-Kingston. Report has it that both A. A. A. and A. C. A. officials are prominent in the management of the meet, among the former being Charles Jerome Edwards, president of the Long Island Automobile Club. However, Mr. Edwards is at the present in California, and from a close personal friend comes the statement that he is confident Mr. Edwards has not authorized the use of his name in this connection.

QUAKERTOWN'S PROJECTED STOCK CAR RACE

Philadelphia, Aug. 24.—With the 200-mile stock car race an almost positive fixture in the Founders' Week entertainment programme, the question has arisen as to whether to run the affair under the sanction of the A. A. A. or under the rules of the A. C. A. The feeling in this city among automobile club members generally seems to be that the race should be run under the rules of the A. A. A.

Meanwhile preparations for the event are going on, and this despite the fact that official permission to use the Fairmount Park roads has not yet been given. But the Mayor is strongly in favor of it; so are his directors, many Councilmen and last, but not least, "Jim" McNichol, the "boss" of the city, who owns several cars and will do all in his power to boost the game.

RULES FOR SAVANNAH'S LIGHT CAR RACE.

Rules for the light car race which the Automobile Club of America proposes to run at Savannah on Wednesday, November 25, the day preceding the date of its proposed race under European rules, have been formally adopted by the club's contest committee. The race will be 200 miles and over a ten-mile course. Cars will be limited to a minimum weight of 950 pounds and a maximum bore of 3¾ inches for four cylinders.

ELLIOT SHEPARD IN BOLOGNA RACE.

Paris, Aug. 20.—America will have a representative in the Bologna race to be held in northern Italy next month under Grand Prix rules, owing to the overturning of the Bayard-Clement car, which finished fourth at Dieppe, and the injuring of driver Rigal. Elliot F. Shepard will replace the French driver.

"Good Luck!"—From "Judge."

HARTFORD DEALERS AT STATE FAIR.

HARTFORD, CONN., Aug. 24.—The original intention of the Hartford Automobile Dealers' Association to hold a show under a large tent during the week of the State fair has been abandoned, and the exhibition will be housed beneath the roof of the skating rink at Luna Park, adjoining the Fair Grounds. The floor space is the same, and then it is a real polished floor, and at night the cars can be safely tucked away from marauders. That interest runs high in the forthcoming exhibition is evident from the fact that every square inch of space has been sold out and several local dealers who were a bit backward are left out in the cold, much to their disappointment, as the prospects are excellent for doing a large business.

Every effort is being made to secure all the old-time models possible for the historical section of the motor car parade in connection with the dedication of the new stone bridge across the Connecticut. The old Selden, Locomobile No. 1, Stanley's early steamer, and many others are being negotiated for. It is the desire of the committee to portray as accurately as possible the evolution of the automobile. It is also the intention to have every commercial car in use in this city to take part in the power-wagon section, and if expectations are only half realized, it will be one of the largest turnouts ever seen in this city. Much is also hoped for from the old-timers' section, as there are many eligible for it hereabouts, and it always serves to attract a large number of people who were not familiar with the automobile in early days.

RELIABILITY RUN FOR INDIANIANS.

INDIANAPOLIS, IND., Aug. 24.—At a meeting held by the committee having the affair in charge, last Tuesday night, it was decided to hold the two days' reliability run under the auspices of the Indianapolis Automobile Trade Association, October 1 and 2. The route, as anticipated, will be to French Lick and return. The first day's run will be 140 miles and the second day's run 120 miles.

A technical committee, consisting of George A. Weidley, of the Premier Motor Manufacturing Company; W. A. Wall, of the National Motor Vehicle Company, and Howard Marmon, of the Nordyke & Marmon Company, has been appointed to arrange the rules, which will probably be similar to those used in the recent Glidden tour. All local manufacturers and dealers will have one or more entries, and it is believed that at least sixty cars will contest.

A GOOD RECORD FOR ONE TOWN'S MEDICOS.

WORCESTER, MASS., Aug. 22.—Gardner, a town of 10,000 population, just north of Worcester, has ten physicians, all of whom acknowledge that for the requirements of their profession automobiles are more serviceable than horses. Drs. A. F. Lowell and W. H. Lyman are running Knox roadsters, Dr. W. H. Ellam swears by the Buick, and Dr. J. B. Donnelly has just bought a Chalmers-Detroit. They have sold their horses and buggies. The remaining six, with but one exception, have been out in different cars within the last week with a view of investing in a machine, and they will soon be converts in fact.

THE PITTSBURG SIX FOR 1909 APPEARS.

The latest model from the shops of the Fort Pitt Motor Manufacturing Company, of New Kensington, Pa., has made its appearance on the road in the hands of Geo. von Rottweiler, its designer. One of the features of the new car is a very simple starting device, particulars of which, however, have not yet been made public. The motor has double ignition with Bosch magneto and Herz distributor with single coil. The change-gear is of the individual clutch type, the gears being always in mesh; the desired pair is engaged by means of a heavy four-jawed clutch. The internal and external brake drums have together 546 square inches of braking surface. Mr. von Rottweiler states that he recently made a trial trip across the Alleghany Mountains to New York and return in 56 hours' running time without any mechanical trouble, a few punctures furnishing the only exciting element.

Mr. von Rottweiler has resigned as managing and mechanical head of the Fort Pitt Motor Manufacturing Company, for the purpose of severing his personal business relations with some of the stockholders, and is reorganizing the company. He will hold a similar position with the new concern.

AUTOISTS WILL HELP OHIO GET ROADS.

AKRON, O., Aug. 24.—Interest in improving highways in Ohio is being given a wonderful impetus by a combination of circumstances. One of the important influences lies in the state automobile tax imposed by the last legislature. Fred C. Caley, in charge of the state licensing department at Columbus, said:

"At the end of five years the state will have collected half a million dollars from motor car owners alone for the improvement of roads. I estimate that the total income this year, the first the new license law has been in operation, will reach $100,000, and inasmuch as the licenses are issued annually only, the receipts ought to easily reach $500,000. Besides, the legislature last winter appropriated $560,000 for state aid to roadbuilding, and the income from the auto licenses is to be used in addition to that. In road building the State will contribute 50 per cent.

A FAMILY EMIGRATING BY AUTOMOBILE.

Here is a modern illustration of the thrilling stories of romance and racing often written about the contests of "squatters" who rush for the government land openings in the West. Now, for the first time, it is believed, an automobile is to be introduced as an aid to reaching the most desirable homesteads first. W. G. Raish and family, of Clarks, Neb., have started on a two-thousand mile trip to the opening of the San Luis Valley reservation, which took place August 12 last. They travelled in their Rambler car and camped out every night. Their equipment, which includes tents, cooking utensils, and a gas range, is all carried on the car. The weight of the party is 740 pounds, and that of the outfit 1,400 pounds, a total load of 2,140 pounds.

W. G. Raish and Family in Their Rambler, Fully

STEARNS ANNOUNCES SHAFT-DRIVEN MODELS

CLEVELAND, Aug. 24.—For the coming season the F. B. Stearns Company announces a new shaft-driven model, which will be practically a replica of the 30-60-horsepower Stearns, as it will embody all the characteristic features of design and construction that have made a name on the latter. It will have a four-cylinder motor rated at 24-28 horsepower, annular ball-bearings throughout, and a shaft-drive of original design. Of equal importance is the announcement that for 1909 the well-known 30-60 four-cylinder model will be made with either side chain or shaft-drive, at the option of the purchaser, owing to the pronounced preference for the latter type.

Apart from this there will be little or no changes of importance in the design of the car, a number of which are now approaching completion in the Stearns assembling room. The Stearns six-cylinder 90-horsepower model will also be continued, practically without any change, but a comparatively small number of this large type will be built. In fact, there is no "quantity" talk about the Stearns plant, as quantity and low prices are elements quite foreign to the Stearns factory atmosphere. Every effort is directed toward the production of quality.

The Stearns shaft-drive presents some new features which make it of considerable interest. Mr. Stearns and his chief engineer, Mr. Sterling, have devoted their efforts to attaining the maximum simplicity with great strength, and an examination of the design shows that they have succeeded in no small measure. An interesting feature of the drive is that it is direct on both third and fourth speeds. The point to which the Stearns side-chain drive has been developed will, however, justify the company in retaining it in those cases where the purchaser prefers this type of power transmission. A great many owners of high-powered cars appreciate its advantages and will have no other.

Everything about the Stearns plant shows that attention is being centered on the production of cars, and though the factory is small, as compared with some of the show establishments of the country, it is one of the most complete of its kind to be found, the Stearns cars being built there from beginning to end. But for the past two years its resources have been severely taxed to keep up with the demand for cars, so that now additions are being made to the factory buildings, and a large order for machine tools has been placed. It is understood that the additional equipment comprised in the latter will place the Stearns plant in a class with the really important producers.

Up to the present time most of the Stearns product has gone to Eastern selling centers, Wyckoff, Church & Partridge, of New York, the Atlantic Coast distributers, taking more than half of the entire output of the factory, and they could have sold more if factory conditions had permitted an increase in the number of cars built. During the past season, however, Chicago has developed into an excellent Stearns market, and the demand from that center will be largely increased next season.

POPE REORGANIZATION TO BECOME EFFECTIVE AT ONCE

HARTFORD, CONN., Aug. 24.—The Pope reorganization committee, consisting of H. Brommer, Frederick H. Ecker and August Heckscher, deeming it advisable that the reorganization should be brought about speedily, has fixed September 8 as the date on or before which the certificates representing the first and second preferred stock must be deposited with the Central Trust Company of New York. The notice to this effect that is being sent to all stockholders is as follows:

"The committee, acting under the plan and agreement of reorganization dated July 15, 1908, gives notice that there has been deposited with the Central Trust Company of New York more than 60 per cent. of first preferred and more than 35 per cent. of second preferred stock. As the committee deems it advisable that there should be a speedy reorganization, it has fixed September 8, 1908, as the date, or before which the first and second preferred stock must be deposited.

"Attention of the stockholders is called to the fact that the right given to acquire proposed notes of the new company, and in addition 50 per cent. of the principal of the notes acquired in par of new stock at a cost of the par of said notes and accrued interest, is conferred upon the depositors of stock, and that no such right is given to the holders of undeposited stock."

Under the plan of reorganization announced July 30 it was stated that participation under this plan in any respect whatever is dependent upon the deposit of securities with the Central Trust Company of New York within such time as may be fixed by notice from the committee. Colonel George Pope stated to-day that, in accordance with this plan, the notice setting the date at September 8 is being sent out. Those whose stock is not deposited by that date will not come in under the reorganization and will thus lose all interest in the company.

GOVERNOR FORT TO OPEN NEW JERSEY CONVENTION

NEWARK, N. J., Aug. 26.—Co-operation of the highest State official is assured the automobilists and farmers for the good roads convention that will be held at Atlantic City, September 25 and 26. Governor Fort, of New Jersey, will make the opening address. The committee in charge of the promotion of the convention is a representative one. It is made up of George W. F. Gaunt, master of the State Grange; H. B. Cook, of the Associated Automobile Clubs of New Jersey; H. A. Bonnell, ex-secretary of the New Jersey Automobile and Motor Club, and Albert Heritage, a member of the executive committee of the State Grange.

A novel and efficient object lesson is planned for freeholders, mayors, road officials and editors. It is nothing less than to carry them to the convention in automobiles, which, to the number of one hundred, have been pledged by the members of the Associated Automobile Clubs of New Jersey and the New Jersey Automobile Trade Association. The runs will start from all sections of the State and go over the roads, both good and bad, within its boundaries, thus arousing the influential men of the State to the benefits of good roads and contrasting them with the obstacles of unimproved highways. Especial emphasis will be laid on the desirability of building continuous routes. Joseph H. Wood, of the local club, will be in charge of the project, in which President Paddock and W. H. Ellis, in behalf of the Trade Association, will co-operate.

Governor Fort was given the other day a taste of the speed-trap graft that is prevalent throughout the State, by running into one himself at Point Pleasant and suffering arrest. The trap in question is declared by automobilists to be an unjust one. They instance the arrest of a man traveling at ten miles an hour, which the constable insisted was a thirty-mile rate and was upheld by the court.

NECESSARY FEATURES OF PROPOSED AUTOMOBILE LEGISLATION

IN view of the fact that several States are contemplating changes in their automobile laws for the purpose of stopping reckless driving over public highways, and at the same time giving the reasonable motorist his just dues, an interview with Walter S. Schutz, counsel for the Connecticut Automobile Association and the man who drafted the present Connecticut automobile law, which is considered a very sane statute, is timely.

"Limitation of speed," said Mr. Schutz Monday, while at the headquarters of the American Automobile Association, 437 Fifth avenue, New York, "was the sole purpose of our earlier statutes; next the identification of the car was considered of importance; then the control and responsibility of the individual operator became the main object of the law. The time is not far distant, in my opinion, when revenue will be the chief, if not the sole reason for automobile legislation. The fact that high-powered cars seriously injure the roads make it necessary to collect an ample revenue from automobilists and apply this to the maintenance of present roads and the new ones.

"There are four points which the model law must cover, viz: proper identification, control of operator, reckless driving provisions, and a clause which will prevent the establishment of traps where the law-abiding motorists are caught on technical violations and through which the speed maniacs easily escape in their high-powered machines.

"My personal opinion is that the examination of drivers, either professional or amateur, avails nothing, and is only a needless expense to the State. Indeed, I believe statistics will bear me out when I say that the great majority of accidents result from the reckless driving of experts, rather than from the ignorance of novices. I do not think we should make any distinction between private operators and professional chauffeurs.

"Public sentiment is opposed to all forms of highway robbery, and in nine cases out of ten a speed trap is operated for no other purpose than to catch a driver and hold him for a technical violation. Each day it is becoming more apparent that the only true test of proper operation is to determine the speed at a particular time, and to take into consideration the width of the highway, the amount of traffic, and the number of pedestrians and the houses along the highway.

"The Connecticut law, which has proven very satisfactory to all classes of citizens and to visiting as well as resident motorists, provides that no person shall operate a motor vehicle on the public highway recklessly, or at a rate of speed greater than is reasonable and proper, always having a regard for other property and for life and limb. Convictions under the new law have been secured under difficulty in cases where the operation of the car was improper, and the Connecticut authorities are holding the reckless in better restraint than they are held in any other State where the automobile laws are based upon speed limitations. An abstract of each conviction is furnished the Secretary of State, and in flagrant cases the Secretary of State has the power to revoke the license of the driver. It is significant that up to this time none of the reports from the courts have recommended such action on the part of State officials.

"A very important feature of the model law is the fair and liberal treatment of non-residents. In Connecticut non-residents are admitted for a period of not more than ten successive days, provided, of course, they carry a license from the States from whence they come.

"As to revenue, it seems to be reasonable to suppose that the automobilists can afford to bear the burden of the reasonable check, provided he is not unjustly hampered in the use of his car, and also feels that the money which he pays is to be used in maintaining the roads. With their constant increase in number, the power of automobilists to properly influence legislation is enormous. If the State automobile associations and the local clubs will work systematically to secure simple and uniform automobile laws, the remaining barriers between States will soon fall away, and petty and needless restrictions upon the proper operation of automobiles will disappear. But this state of affairs cannot be brought about without the co-operation of the great body of motorists at large in suppressing the reckless element."

PROBLEMS OF SUPPRESSION OF DUST ON PUBLIC ROADS

WASHINGTON, D. C., Aug. 24.—Under the caption "Dust Preventives," Logan Waller Page, director of the Office of Public Roads, has prepared for the Department of Agriculture, an elaborate paper in which he goes into this important subject very fully. The following excerpts from this paper will interest automobilists generally:

The most important problem which has confronted highway engineers in recent years is the suppression of dust on roads. Not until the introduction of motor vehicles, however, did this become a factor of sufficient importance to engage the serious consideration of road builders and road users. Fast motor traffic has reached such proportions at the present time as to shorten the life of our most carefully constructed and expensive macadam roads to a great extent, and to keep them in a loose and uneven condition. Before entering into a detailed discussion of the damage to roads from automobiles and methods for its prevention, it may be well, for the sake of those unfamiliar with the subject, to consider its cause, and why the situation has become so serious of late.

The macadam road has been developed with the object in view of withstanding the wear of iron-tired horse vehicles, and it has met successfully the demands of suburban and rural traffic until the advent of the automobile. When in its highest state of perfection, the rock from which such a road is made is so suited to the volume and character of traffic which passes over it that only an amount of dust is worn off sufficient to replace that removed by wind and rain. The dust remaining should be just enough to bind the surface stones of the road thoroughly, forming a smooth, impervious shell.

When such a road is subjected to continuous automobile traffic, entirely new conditions are brought about. The powerful tractive force exerted by the driving wheels of automobiles soon disintegrates the road surface. The fine dust which ordinarily acts as a cementing agent is thrown into the air and carried off by wind or is easily washed off by rains. The pneumatic rubber tires wear off little or no dust to replace that removed by natural agencies. The result is that the stones composing the road become loose and rounded, giving the greatest resistance to traction, and water is allowed to make its way freely to the foundation of the road.

Many remedies have been suggested and tried for meeting this new condition, but a perfectly satisfactory solution of the problem is still to be found. Some success has attended the efforts of those who have sought to find a cure for the evil, and this is encouraging when the many difficulties to be overcome in the treatment of thousands of miles of roadway are considered. It is apparent that this problem can be solved only by the adoption of one or two general methods: (1) By constructing roads in such a manner and with such materials as to reduce to a minimum the formation of dust; and (2) by treating the surfaces of existing roads with materials that will give the same results without the necessity of rebuilding.

WHAT IS GOING ON AMONG THE CLUBS

BAY STATERS MAKE GOOD THIRD MOVE.

BOSTON, Aug. 26.—It is said that three moves are as bad as a fire, but this well-known aphorism surely cannot apply to the Bay State Automobile Club, which this week made the third move in its history, taking possession of its fine new clubrooms in the Hotel Carlton in upper Boylston street. When the club was organized it located in the Hotel Lenox. Outgrowing these quarters, it went to Auburndale and for a time occupied a part of the Woodland Park Hotel. The next change was to the finely equipped clubhouse on Dartmouth street, where it has been located for some years past.

For the occupancy of the club the management of the Hotel Carlton has rebuilt a large part of the street floor of its building and has constructed a private entrance from the Hemenway street side, so that to all intents and purposes the clubrooms are as exclusive as if in a separate building, while the members have the great advantage of the hotel service both for the ordinary club purposes and for the restaurant, which is entirely separate from the hotel restaurant. The new clubrooms consist of six apartments, three of which are very large, one of them having been made by tearing out a half dozen or more ordinary hotel rooms. There are no sleeping accommodations in connection with the clubrooms, except the secretary's room, but the hotel offers all that could be desired in this respect. All the rooms have been rebuilt and refinished under the personal direction of Secretary James Fortescue and the board of directors, and the result is most pleasing. This move on the part of the Bay State Club has been effected just in time to have the new quarters ready for the opening of the fall season, with its numerous activities in the shape of contests and other events to to be held in the next two months.

CONNECTICUT'S STATE BODY MUCH ALIVE.

HARTFORD, CONN., Aug. 24.—Secretary G. K. Dustin, of the Connecticut Automobile Association, has notified the various clubs throughout the State, as well as elsewhere, of various roads now being or shortly to be repaired. The "hen-coop" bridge stretch is to be repaired immediately, and during the period of reconstruction motorists will not be able to drive from Springfield to Hartford or vice versa on the west side of the river. Coming from the north, motorists must cross the bridge at Windsor Locks, if coming down on the west side, completing the balance of the trip on the east side. The trip can be made from the north by the east side entirely if desired. This stretch is the New York to Boston one and on leaving Hartford the east side of the river should be taken.

In the immediate future the seven-mile stretch of macadam is to be laid down on the New Haven turnpike between Hartford and Berlin. This route should not be followed for at least three weeks to come, if not longer. In Branford motorists should follow the shore road and avoid the highway passing the driving park, as it is now ripped up and will be for some time to come. Leaving New Haven due north for Hartford, Springfield and Boston, motorists should keep on the left-hand side of the river coming up to North Haven as far as Yalesville and then on through to Tracey, or, if desired, the bridge may be crossed at Wallingford, then across the railroad tracks through Wallingford to Hartford. The North Haven stretch is the one between the towns of North Haven and Wallingford, which has been bitterly complained of of late.

The membership of the Connecticut association has been increased by the admission of the newly formed Litchfield County Automobile Club of Torrington, with 116 members. There are now seven active clubs.

A MID-SUMMER RUN OF THE BLUE GRASS MOTOR CLUB.

From Lexington to Paris, Ky., through the blue grass region, the county has fine roads, over 85 miles being included of solid well-oiled and well-kept roads, over which it is a delight to drive.

AVON MOUNTAIN FOR HARTFORD CLIMB.

HARTFORD, CONN., Aug. 24.—The Automobile Club of Hartford, through its committee, has scoured the country round in an endeavor to locate a "real" hill. Last year's climb was the initial event for the local club, and was in every way a success. It was thought that the same course might be used this season, but after the experience of the recent endurance run the contest committee was firmly convinced that there were other steep grades and far better adapted to a test of climbing capability. Recently, H. P. Maxim, chairman, W. C. Russell and C. H. Gillette, of the contest committee made a trip to Avon Mountain for the purpose of going over the proposed course, and as a result of their investigation of its possibilities as the venue for a hill-climb, it is more than probable that it will be selected for the purpose, as it affords a rise that will provide a hard test for the cars without any danger.

The Avon course is of fairly good surface, being a succession of sharp turns, level stretches and sharp rises; in the latter respect it is much like Dead Horse hill. The distance from start to finish is a little over a mile. October 17 is the probable date for the climb.

A PROGRESSIVE PENNSYLVANIA CLUB.

NORRISTOWN, PA., Aug. 24.—Scarcely more than a year old, the Norristown Automobile Club is certainly the most lusty infant in the game. Not content with pulling off successful endurance runs and record-breaking hill climbs, just like the

big clubs in the large cities, this youthful but energetic organization is now in a fair way of having a club house of its own. At its next meeting the club will consider the offer of Lewis E. Taubel, one of its prominent members, to take over a large modern stone mansion on the Ridge pike, above Jeffersonville, and convert it into a club house, which can be done at comparatively small expense, as the building is adapted in every way for the purpose. In addition to the house proper the handsome grounds surrounding it are admirably suited to the purposes of golf links, of which ancient Scotch game the club contains many admirers. The enthusiasm among the members over the project practically insures the success of the new venture, and it only needs the official sanction of the club to put the deal through.

BRIDGEPORT CLUB IS WARNING SPEEDERS.

BRIDGEPORT, CONN., Aug. 24.—The Bridgeport Automobile Club has begun a campaign against excessive speeding in the city limits. Residents of Connecticut avenue, a much-traveled thoroughfare which forms the eastern approach to the city, have made many complaints about this, with the result that the club's public safety committee placed flagmen on this avenue and handed all automobilists cards asking that a reasonable speed be maintained. The committee has also sent out circular letters to the members of the club requesting them to join in supporting the law, which is one of the most liberal in the country.

A. C. OF MARYLAND DRAWS UP A NEW LAW.

BALTIMORE, MD., Aug. 24.—Osborne I. Yellott, counsel for the Automobile Club of Maryland, is preparing a bill to be presented to the next Legislature, the object of which is to put an end to reckless driving in this State. It provides that no person shall be allowed to drive an automobile until he has gone before a competent jury and passed a rigid examination as to his fitness. President James S. Reece, of the club, believes that stringent legislation is now absolutely necessary. As the legislature does not meet for some time to come, the club will endeavor to have a similar ordinance passed by the City Council of Baltimore to give immediate relief to the city.

SPRINGFIELD'S SEPTEMBER CLIMB.

SPRINGFIELD, MASS., Aug. 22.—The following officials have been selected by the Automobile Club of Springfield to have charge of the automobile hill climb contest, to be held September 11 on Wilbraham Mountain, near this city:

Judges.—J. C. Kerrison, Boston, Bay State Automobile Club; Frank G. Webb, Brooklyn, vice-chairman of the racing board of the A. A. A.; A. G. Batchelder, New York, and S. L. Haynes, Automobile Club of Springfield.

Referee.—C. H. Gillette, Automobile Club of Hartford, Conn.

Starter.—Fred J. Wagner, New York.

Assistant Starter.—J. H. Bartlett, Automobile Club of Hartford.

Official Timers.—Timers Club of New York.

Clerks of Course.—To be elected from members of Springfield club.

Six cups have already been donated for competition in the climb, as follows: Worthy Cup, Cooley Cup, Massasoit Cup, Norcross & Cameron Cup, Ericka Cup, President's Cup, Mark Aitken, president of the Automobile Club of Springfield.

THAT INTERNATIONAL ROADS CONGRESS.

LONDON, Aug. 20.—Britishers will take an active part in the first International Roads Congress, to be held in Paris from October 11 to 18, under the patronage of the French government, for in addition to a delegate appointed by Parliament several papers will be read by the English delegates. Colonel Crompton will deal with "Improvements in Self-Propelled Vehicles so as to Reduce Road Wear;" the Hon. C. S. Rolls will deal with "The Effect of the Road Surface on the Vehicles;" Lord Montague has taken for his subject "The Value of Good Roads"; Rees Jeffreys deals with "Systems of Highway Administration Compared—Their Influence on Cost and Efficiency."

A De Luxe Party In Detroit.

D. W. Kaufman, general manager of the De Luxe Mo Company, and his wife and child in front of their home on ward avenue, Detroit.

FRAYER-MILLER TAXICABS NOW IN FIE

Among the first representatives of the air-cooled t car to enter the taxicab field are five Frayer-Miller car by the Oscar Lear Automobile Company, Springfie which are now running around the streets of New Yo in regular service. This new addition to the Frayer line is not a touring car made over to adapt it to the p but has been specially designed with a view to this a form of service. The power plant consists of the reg 24-horsepower Frayer-Miller, air-cooled motor, on wh blower is belt-driven, thus making it noiseless. The is so installed that it may be removed and a new one its place in less than an hour, and the same thing is al of the rear axle driving unit, which is of the heavy typ ufactured by the Standard Roller Bearing Company, a ing a three-speed gear set in combination with the d tial and axle. An extension top is provided and can down or removed in a few minutes.

Goodrich Rubber Company's Airship—"Akron to M

GOOD ROADS ACTIVITY IN SOUTHERN CALIFORNIA

LOS ANGELES, CAL., Aug. 20.—Unless the East looks most promptly to her laurels and interests, the far West seems in a fair way to outstrip her in the race for good roads, which within the last twelve months has got going so auspiciously in almost every populous State of the Union. On July 30, at an election, the electorate of Los Angeles county, California, put through by a vote of over three to one a bond issue, having for its avowed purpose the immediate expenditure of $3,500,000 on a comprehensive system of scientifically-built county highways, totaling 307 miles. To the casual newspaper reader the brief accounts of this progressive action by an enlightened community might seem to possess only passing interest, but a more critical analysis quickly develops facts and conditions of extraordinary significance.

For one thing, let it be considered that the amount of this appropriation so unanimously made by the people of a single county of the Golden State is one-fourteenth as great as the total demanded for the entire country by the Brownlow bill, which only three years ago was defeated by the solons at Washington, on the ground that it was too terribly extravagant to squander $50,000,000 on improving the national commonwealth with good roads. For another, let it be understood that the fact of its limitation to a single county must not obscure the importance of this newest highway appropriation, for Los Angeles county is very nearly as large as is the State of Connecticut, is twice as large as Delaware, and four times as large as Rhode Island.

That the appropriation must mean really good roads is assured by the liberal basis on which it is figured. The $3,500,000 divided by 307 (the total mileage) comes to $11,400 a mile—a sum amply sufficient to the building of the type of highways that make of Europe a paradise for touring autoists. And it is just this type that it is intended to construct, for the waste of good American dollars abroad by seekers for good automobile going has been coming home more and more to the business interests of Southern California—a section which finds both growth and prosperity in an increasing touring contingent.

Already a start has been made on the kind of good roads it is proposed to build, the magnificent Huntington boulevard between Los Angeles and Pasadena being now well along towards completion. This boulevard is about ten miles in length, and besides having wide turns and easy gradients, is of ample width and splendid surface. A perfectly graded and lightly crowned foundation of unusual thickness is the basis of this example of good roads building, while the top dressing is a highly durable sort of "oiled macadam"—a dust, mud and wear-proof surfacing that secured the evenness of asphalt without its slipperiness and perishability. All of the new 307 miles will be similarly built and surfaced, the work being in charge of A. E. Loder, a United States engineer, who, for his expert knowledge of road making, was recommended to the authorities of Los Angeles county by Secretary Taft.

As for the perils of graft and misappropriation, these will be minimized by the wide publicity given the enterprise and by interested watchfulness of many and various powerful organizations, such as the militant Automobile Club of Southern California, which, with a membership of some 1,400 strong, is a power to reckon with in the affairs of the great Southwest. Indeed, in no part of the country are automobile interests more powerful than in California, in which there is an automobile to every one hundred of the population. No other State has anything like such a proportion.

Automobile Club of Southern California Is a Power.

Los Angeles has many more automobiles than any other city in the world of anywhere near its size, while the State list is increasing at the rate of 600 a month, despite a total population of only 1,800,000. Moreover, the good roads sentiment in California is on a commensurate basis, as is witnessed by the fact that other counties of the State are on the verge of putting through heavy bond issues for road building. In this way it is fully expected to attract many Eastern autoists, a proportion of whom will, of course, be certain to become permanent residents.

Probably nothing better impresses upon one the magnitude of the Los Angeles county road plans than a consideration of what these plans would involve if extended proportionately to the entire United States. The population of Los Angeles county is about 350,000, so the bond issue of 3,500,000 is equivalent to $10 for each individual in the county. On the same basis, the population of the whole country being about 85,000,000, $850,000,000 would be required to provide all of the United States with as much good roads in proportion to population as Los Angeles county is on the verge of realizing. Or, to figure on a basis of proportionate area, that of California country is one-eight-hundredth of that of the nation, which would require $2,800,000,000 to provide the entire area with roads of similar extent and quality.

The method of providing so considerable a sum of money without working hardship to the taxpayers should be of interest to many communities. The total assessed valuation of all property in the county being about $300,000,000, it was arranged that the payment of principal and interest on the bonds should be distributed over a period of 40 years, requiring the addition of only 40 cents per $1,000 per annum to the tax rate. In other words, on each $1,000 worth of property a total of $16 is to be paid in 40 annual installments of 40 cents each, so if property now worth $1,000 is, in the course of 40 years, enhanced by good roads to a value of more than $1,016, an entry on the profit side of the ledger is assured.

A more immediate result is the prompt importation to the county of $3,500,000 of good Wall Street money, which will be expended at once and the benefits of its expenditure enjoyed, while it will not have to be repaid for 40 years.

One advantage of a lump appropriation of this kind and its immediate expenditure for a system of roads is that an ideal uniformity of scientific planning and construction is thereby permitted. Surveying corps will be organized, rock quarries opened, machinery purchased and small armies of laborers hired on the most efficient and best organized basis possible. Then, when the new system is completed, the regular annual county road appropriation will be wholly available for road maintenance and the building of minor laterals.

LOUISIANA INTENDS TO HAVE GOOD ROADS AT ONCE

NEW ORLEANS, LA., Aug. 24.—The first work of the Good Roads lobby of the Louisiana Automobile Association has been to introduce a bill into the legislature creating a State tax for automobiles and to license all chauffeurs, who must first pass a strict examination. All taxes and licenses are to be turned into a good roads fund, for the improvement of the roads.

The bill has met with instantaneous favor all over the State, and there is no doubt of its passage. Autoists are to a unit in its favor, and the licensing of the chauffeurs is the part that has met with favor with the general public. Especially is this so among the farmers, who are not altogether reconciled to the "smoke wagon" as yet. They are naturally in favor of anything

that will insure better and more careful driving of cars. Then, too, the good roads proposition is one in which they are all greatly interested. And as the major portion of the legislators are from the rural districts, the bill has been admirably drafted.

The Louisiana Automobile Association is, perhaps, the only one of its kind in the South that is keeping a lobby at its ture. All of the plans of this lobby for this session and whole summer are towards the good roads proposition. roads are the one thing necessary to make the South the for tourists, and they have gone about with this idea in

PENNSYLVANIA HIGHWAYS ARE RAPIDLY BEING IMPROVE

THE work of the reconstruction of Pennsylvania roads is now making more rapid progress than at any time since the organization of the State Highway Department by Highway Commissioner Joseph W. Hunter late in 1903. Although actual work on the construction of state roads did not begin until 1904, there had been constructed up to August 1, 348 miles of improved road, and there were under contract or in course of construction, no less than 325 miles. In addition, surveys have been made and are now being made for many additional miles of state highway. During these five years every county has made application for the reconstruction of some of its roads, many turnpikes being abolished in order to secure state aid. New roads have not been built in every county, however, because the supervisors of townships have not always followed up the projects after surveys and estimates had been made.

Both Governor Edwin S. Stuart and Highway Commissioner Hunter are strongly in favor of better roads connecting with all the important cities of the state, and of the reconstruction of the old state road leading from Philadelphia to Pi This is a pet scheme of Governor Stuart's and it i that the next Legislature will be asked to make a big priation for the reconstruction of this old national h From this it is proposed to have state roads running county seats throughout the State.

The Pennsylvania State Highway Department grew o force of four men, named in 1903, and is now cons roads at a rate which, if continued, will put Pennsylvani of all other states within a few years. The yearly cons is now considerably ahead of New York, which has bec ing roads for ten or twelve years, and is in advance o sachusetts and the states of the Middle West, which are close attention to road building. Pennsylvania's road been a bitter experience for touring automobilists and a of much mortification for residents of the state, but v short time its citizens can invite tourists to visit Penn on roads as good as any in the United States.

MINNEAPOLIS ROAD-MAKERS DISCUSS DUST PROBLEM

MINNEAPOLIS, Minn., Aug. 22.—Experiments in road-oiling and surfacing, conducted by the park authorities of the principal cities in the country, were the subject of exhaustive reports made at the annual convention of the American Association of Park Superintendents in session at Minneapolis. The first paper upon the subject was read by Superintendent M. H. West, of Lincoln Park, Chicago, and this was followed by the statement of the experience of other park directors in attempting to find a dustless and automobile-resisting surface for the city drives. Mr. West reported that he had obtained the best results with an emulsion residuum and paraffin oils. By the Chicago formula the oils are mixed in the proportion of one part residuum of about 1.9 specific gravity with three parts paraffin base fuel oil. One part of the mixed oils is then combined with nine parts of hot water, to which naphtha soap is added in the proportion of 15 pounds to 500 gallons of water. Roads treated with five applications of this emulsion came through the winter in good condition. J. W. Rodgers, of Cincinnati, gave the experience of the park board of that city with a preparation similar to that described by Mr. West, but containing 25 pounds of soap.

For dust laying in cities where there are extensive stretches of gravel and dirt roads, but little macadam, a light paraffin oil is the best. Minneapolis is in this class, and Superin Wirth and City Engineer Rinker presented the city's p to the convention. The park board is now using a par and dressing afterwards with sand. Clay roads in Kan have caused trouble in the use of oil there. Superinten H. Dunn stated that it could not be used on the cla ways unless the surface was well bonded and solid; and hills the oil made the roads too slippery for horse traff periments are now being made to overcome this.

Mr. West declared himself opposed to ordinances aga use of chains and other anti-skid devices. He said that lieved that the damage done by these devices to the ro face had been much exaggerated. Assuming that the is caused by the release of a vacuum formed by a flatte and by the slipping of the tire under the tractive force by the rear wheels, it is obvious that any device which tend to prevent this vacuum, or to decrease the shearing would help in a degree to maintain the road, rather t reverse. However, Mr. West said, these effects were to some degree even when chains are used, and he me this point only to bring out that it did not seem justif prohibit the use of devices by which public safety is g when only a questionable harm to public property is aver

OHIOANS WANT AN ENDURANCE RUN AND A BOULEVARI

TOLEDO, O., Aug. 24.—Efforts of local automobile dealers are now centered in arranging for an endurance run which will take place toward the close of this month. The affair will be entirely local, in that it will be confined to Ohio, being the first of its kind to be pulled off within the confines of the Buckeye State. Plans already perfected call for a three days' run, starting from Toledo, going to Columbus for the first day, from Columbus to Cleveland for the second, and from Cleveland to Toledo for the third. No particular efforts will be made to secure speed, but, in the main, the same general regulations will be observed as those in the Glidden tour. Practic the factories having local agencies have arranged to par in the proposed endurance run.

The very pretentious idea of constructing a grand bo from Cleveland through Toledo to Detroit is now r some attention in this section. The total distance is ab miles, a portion of which could easily be built at small co Toledo Chamber of Commerce has taken interest in the taking, and it has ascertained that the road desired could at a cost of about $7,000 per mile.

The Rambler Demonstrating Car Tackling the Steep Grade at Lemont.

Rambler Climbing Stunts.—A remarkable story comes from the Chicago representatives of Thomas B. Jeffery & Co., about the performances of their Rambler demonstrating car. They claim to have found the steepest hill in the Middle West near the town of Lemont, Ill., its grade being 50 per cent. In a recent demonstration a four-cylinder Rambler carried five people up this hill. When half-way up the brakes were put on, locking the wheels, but the car slid back eleven feet of its own weight. The incline was so steep that the passengers in the tonneau could not stand.

Chadwick Wins More Honors.—According to dispatches received by H. B. Larzelere, general sales manager of the Chadwick Engineering works, at the Philadelphia branch, the Great Chadwick Six achieved more hill climbing honors by beating out the field in the Ohio Valley Automobile Club's free-for-all at Wheeling, W. Va., last week. The car was entered by A. W. Paul, an amateur owner and driver, and the Chadwick makers knew nothing of his entry and victory until he wired them concerning it as follows: "My Chadwick won hill-climb race to-day at Wheeling in 2:42½; White steamer driven by Paul Melchert finishing second." The event was the principal one on the club program for the day and was held on Campbell's Hill, which is a stiff and winding grade of 1 1-3 miles. By finishing first Mr. Paul and his Chadwick become the possessors of the silver trophy offered by the club.

Continentals in Australia.—Word comes from the home factory of the Continental Caoutchouc Company, Hanover, Germany, that word has been received there of a trip across Queensland, Australia, by the Hon. J. W. Blair in a Panhard equipped with Continental tires. These were 150 mm. rear and 125 mm. front, and although the roads, where there are any, are extremely rough, the tires came through the 3,000-mile trip with but little perceptible wear, no replacements having been found necessary throughout the entire distance, over stretches never seen by an auto.

Big Carbureter Contract.—F. H. Wheeler, of Wheeler & Schebler, manufacturers of the Schebler carbureter, recently closed a contract with the Buick Company, of Flint, Mich., for 21,000 carbureters for the Buick 1909 product.

Field for Large Cars.—"There is still a large field to be filled by automobiles of the pleasure car type, and it is a mistake to think that the demand has nearly reached its limits," says James Joyce, manager of the American Locomotive Company's automobile department. "There is a demand of remarkable proportions for low-priced cars from persons who never owned a car before, and there is still an astonishing number of well-to-do persons who have not yet joined the ranks of the automobilists. Many of the latter will have nothing less than the very best when they get ready to buy, and the demand from them for cars of distinctively high quality will be added to that steady demand for cars of the exclusive class which comes from those who have had from one to four years' experience with various grades of cars, and have learned the economy of buying what costs least to maintain regardless of the initial price."

Shock Absorbers en Tour.—The "Shock Absorbers," a band of Philadelphia automobile writers, will journey to the Vanderbilt elimination trials in October in a White steam opera 'bus, camping out on the road. They will carry a tent and a chef, with a full commissary department, and will be delightfully independent of the grasping Long Islanders. All will be dressed in white suits, caps and neckties, and the car will be dubbed "The Water Wagon." The party will include Harry Lasher, E. K. Gilchrist, Jack Hiscock, H. McK. White, Richard Kain, John A. Cleary, E. H. Leach, George W. Daly, W. Blackman, Clyde Woolson, Robert Turner, H. W. Sharp, I. C. Minford and Harry J. DeBear.

Maxim's Noiseless Gun Tested.—Official tests of Hiram Percy Maxim's new noiseless rifle were made at Springfield, Mass., a few days ago, and showed that while the ordinary rifle could be heard 3 1-4 miles away, the Maxim rifle's only indication of its presence was a mere click, not distinguishable further than 1,500 yards away. The tests were made at the "Sixteen Acres" range, under the supervision of Major Kenneth Morgan, U. S. A., and proved very satisfactory.

Where Prominence Has Its Drawbacks.—"It must be very fine to so predominate in your field of manufacturing that when anybody thinks of a 'steam car' they think of the White," said a prominent gasoline car manufacturer a few days ago to Windsor T. White, president of The White Company. "It *is* a fine thing, and yet there are times when we wish that the public would keep in mind that there are other makes of steam cars," replied Mr. White. "As you well know, in the early days of the industry, a lot of steam automobiles with ordinary boilers were built by incompetent people. Most of these cars, of course, went to the scrap-heap long ago. But every once in a while some one digs up one of these obsolete steamers and fixes it so that it will run. Sooner or later—generally sooner—something happens to this 'steam automobile,' and we are more than likely to get the discredit for it. For example, about two weeks ago an old Geneva steamer blew up near Painsville, O., with disastrous results. The published reports of the accident spoke of a 'steam machine blowing up,' and some people who do not know our car and who, therefore, do not realize that such a thing is an absolute impossibility with the White, thought that one of our machines was involved. If these people had given any thought to the old crude steam cars, they would undoubtedly have placed the blame where it belongs."

Bretton Woods, N. H., Garage.—With the exception of the garage in Boston which was made from the old depot of the Boston & Albany Railroad, the establishment at Bretton Woods is said to have the greatest amount of floor space that any establishment of the kind in the country can boast, while it is said that its daily business is equal to that of the largest metropolitan garages. With its 30-foot aisle, extending 220 feet from door to door, and its two long lines of cars in their "stalls" against each wall, the garage is a sight for the curious, as the cars are constantly coming in and out. In the rear there is a 55 by 60-foot machine shop.

Minnesota Road Law Void.—The Minnesota Supreme Court has declared the county superintendent of highways law, enacted in 1907, unconstitutional, on the ground that it is not general legislation, as it applies only to counties of under 200,000 population. This law abolished the system of road supervisors selected by township and county boards, and provided for the appointment of county superintendents at a proper compensation. Experts had been appointed in many counties, and systematic road improvement was being undertaken. Steps will be taken at once to frame a new law.

Another Parts Maker.—The McCue Company of Hartford, Conn., which has been building gears and work in the white for the wholesale carriage trade for fifteen years, is adding automobile parts to its line. It will supply everything which enters into the construction of an automobile, including all kinds of forgings, brake and control levers, hubs, hearings, I-beam front axles, and floating type rear axles.

Touring in California.—The California Promotion Committee is prepared to supply, without cost, to all persons interested in California, and who intend at some time to make an automobile trip in that state, full particulars of the routes, with photographs, maps, guides, and other valuable information. A line to the committee at its headquarters, California Building, Union Square, San Francisco, is all that is necessary to receive it by return mail.

The New York Home of the Gyroscope.

Gyroscope to Race.—The first entries for the light car race at Savannah were made last week by the Gyroscope Automobile Company, through A. L. Kull, the general manager. This will be the first appearance of the Gyroscope cars in the racing field, but it is claimed that they have a valuable feature for this work in the gyroscopic action of the flywheel, which enables them to round corners at high speed. The photograph shows the Gyroscope's New York home, 231 West Fifty-fourth Street.

An International Auto Paper.—Such is *La Voiturette*, published in Paris by Georges Dupuy. As its name implies, it is specially devoted to the interests of owners of runabouts and light touring cars, and its articles, whether technical, descriptive or humorous, are written by the best authorities and are very interesting. It contains a section in English, which is highly appreciated by English and American tourists in France. The offices of *La Voiturette* are located at 78 Rue Charles Laffitte, Neuilly-Paris.

The Suggestion System.—In order to make it easy for the employees to give the company the benefit of their ideas, the Chalmers-Detroit Company has inaugurated a suggestion bureau in its factory. A number of small registers, such as are used in many stores for making duplicate copies of bills, have been placed in convenient positions, and the employees are invited to write on these any suggestions they may wish to make regarding the work they are doing. Prizes are awarded quarterly for the best suggestions.

Gramm-Logan Makes Announcement.—The Gramm-Logan Motor Car Company, the formation of which was announced last week, announces that it is located at Bowling Green, Ohio, a few miles south of Toledo, affording excellent shipping facilities. J. B. Wilson, a man of great business experience, is president of the company; B. A. Gramm, formerly of the Logan Motor Car Company, is vice-president and general manager, and Fred Bisantz, superintendent.

Dog-Hunting by Auto.—Henry Mower, the stray dog commissioner of Worcester, Mass., was badly rushed with his work last week. The accumulation of jobs in various parts of the city looked hopeless until he had the bright idea of obtaining an auto. The way he is now chasing around the city and mowing down the long list of delinquent dog-tax payers is creating a commotion in the city treasurer's office.

Campaigning in Auto.—Governor Fred M. Warner, of Michigan, who is making a vigorous campaign for reëlection, uses a Jackson automobile to carry him to the towns where he is due to make speeches. During the past two months he has covered thousands of miles in this way and has made addresses in hundreds of towns and villages which he could not possibly have reached in the same length of time by any other means of conveyance. Mrs. Warner and Lieutenant-Governor Kelley frequently accompany him. The Governor has no fear of prejudicing the farmers by his use of the automobile, as many of the country people in the State own cars.

Quick Mail Delivery.—From Suffield, in the Connecticut tobacco belt, comes the news of a wide-awake rural mail carrier who has given up horses for the more speedy automobile. The carrier is himself a tobacco cultivator and he claims that the automobile saves him three hours, which he is enabled to devote to the cultivation of the "weed." He says it costs him just eighteen cents a day to operate the automobile, and horses cost him a dollar.

Goodrich New York Headquarters.—The B. F. Goodrich Company, Akron, O., will shortly erect a six-story building in New York City exclusively for its metropolitan headquarters. The site at 1776-1778 Broadway, now covered by the buildings occupied by the Stoddard-Dayton, Renault and Ajax-Grieb agencies, has been acquired, and the buildings themselves will be torn down to make way for a new structure erected especially for the purposes of the tire makers.

TRADE PUBLICATIONS

Chalmers-Detroit Motor Company, Detroit, Mich.—This company's 1909 catalog is a neat and business-like booklet, without any exaggerated "fine language," but crammed full of just the kind of information the average buyer wants. The first and larger part is devoted to the new Chalmers-Detroit 30, which has created such a sensation in the trade. A brief explanation of the company's policy for the coming year, and of their purpose in bringing out the car, is followed by a thorough and painstaking description, not too technical, and illustrated by a profusion of views of the motor, gears, and chassis from every possible position. The part of the catalog describing the Chalmers-Detroit 40 is not so detailed, as this car is practically unchanged from last year, and the company expects that the reputation the car has already acquired will be sufficient to sell the output.

R. I. V. Company, New York.—R. I. V. ball bearings form the subject of a handsome catalog issued by this company, which holds the American agency. These bearings are of the radial type, but are distinguished by the means used to separate the balls—a ring of anti-friction metal cast around them after they are arranged in their proper positions. The catalog contains a complete list of the different types and sizes of the bearings, and their dimensions, loads and prices, and also drawings showing various applications.

Michigan Automobile Company, Ltd, Kalamazoo, Mich.—A neat little booklet comes from this company describing their planetary transmissions for automobiles. These gears are made in two sizes, for either shaft or chain drive. The planetary pinions are arranged on the well-known Ball system, with a triple-plate type of high speed clutch, cast iron against fiber. The smaller size is especially adapted to high wheel buggy autos.

IN AND ABOUT THE AGENCIES.

Cadillac.—Brown & Underwood, New Haven, Conn., agents for the Cadillac, will move into their new quarters at Broadway and Dixwell avenue about October 1.

Chalmers-Detroit.—D. B. Dey and O. T. Fenton have formed a partnership and will represent the Chalmers-Detroit line in Hightstown, N. J.

Continental.—The Continental Caoutchouc Company is about to open an agency in Los Angeles, Cal., which will be placed in charge of E. L. De Camp.

Havoline Oil.—T. E. Tomlinson, the secretary and general manager of the Havoline Oil Company, reports that he has made arrangements with W. P. Fuller & Co., of San Francisco, to take the agency of Havoline oil on the Pacific Coast, and in the Hawaiian Islands.

Studebaker.—The Studebaker Brother Company has just acquired a piece of property at the corner of Alden and Chapman streets, Portland, Ore., and will immediately begin the erection of a brick garage.

White.—An agency of the White Company has just been established in San Diego, Cal. It is under the management of Earl Pfiefer.

PERSONAL TRADE MENTION.

F. D. Stidham, for a number of years with the Cadillac Motor Car Company, Detroit, Mich., and recently the chief observer in the A. A. A. tour, has just been appointed manager of sales for the automobile and motor boat departments by Stanley & Patterson, 23 Murray street, New York City. Mr. Stidham will devote a large part of his time to the sale of the Patterson "Wireless" dry battery holder.

C. H. Smith—C. S. Calvert.—The Winton Motor Carriage Company has engaged G. H. Smith and C. S. Calvert to cover Eastern and Western territory, respectively. Mr. Smith was formerly Philadelphia manager for the White, and Mr. Calvert for years sold Wintons in Newark, N. J.

C. C. Crispen, who has been connected with the Pennsylvania Automobile Company for the past five years, has recently severed his connection with that concern. An announcement of his future plans will be made shortly.

George Arbuckle has been appointed appointed chief of the Winton supervisors by Sales Manager Churchill. Mr. Arbuckle has been on the Winton staff since 1902. company handles the Stoddard-Dayton.

George R. Moran, well known in the automobile industry, has accepted the position of sales manager of the Alamo Automobile Company, San Antonio, Tex. This company handles the Stoddard-Dayton for that territory.

H. Oscar Brown, formerly the Philadelphia agent of the American Locomotive Company, Providence, R. I., has joined the sales forces of the Bergdoll Motor Car Company in the Quaker City.

William Cadzow, formerly with the Wyckoff, Church and Partridge Company, has joined the Yonkers Auto Station, Yonkers, N. Y., Westchester county agent for the Stearns and the C. G. V.

W. J. Coghlan—C. A. Duerr.—Mr. Coghlan and Mr. Duerr are again associated as New York agents for the Moon. They formerly handled the Royal Tourist.

INFORMATION FOR BUYERS

Prest-O-Carbon Remover.—This is one of the latest specialties being introduced by the Prest-O-Lite Company, Indianapolis, Ind. The purpose of the preparation is to effect a thorough removal of all carbon from cylinder heads, pistons, valves and other parts without the usual labor of taking the engine down and scraping. The

TWO NEW "PRESTO" SPECIALTIES.

compression space of the cylinder is filled with the Carbon Remover, which is allowed to stand for 30 minutes, and is then removed. After this the motor is run with the spark retarded and the throttle wide open, and the carbon, which has been dissolved and loosened, is blown out the exhaust. The makers guarantee that a single treatment is sufficient to remove every particle of carbon. It does not contain kerosene, but is a new combination of chemicals, and may be used several times before losing its strength. It is applied with an oil gun and removed in the same manner. It is put up in gallon, half-gallon and quart cans. Another specialty just placed on the market by this company is the Prest-O-Lite instantaneous detachable tank band, which fastens with a hinged thumbscrew, so that the tank may be put on and taken off in a fraction of the time formerly required. The new band is sold at the same price as the old style, and may be had from any dealer handling the Prest-O-Lite line.

Gordon New England Tire Cover.—This is one of the many specialties manufactured by the Vehicle Apron & Hood Company, of Columbus, O. As shown by the accompanying illustration, it has been designed with a view to making the process of placing a tire in the cover or removing a tire from its cover a much shorter and more convenient operation than is the case with other methods of fastening. Snap fasteners are employed and they are placed on the cover in a position where they will come on the tread of the tire, thus affording a firm ground on which to press down in closing them. The tire in its cover may thus be laid down on or against any polished surface without any danger of marring it. Other specialties made by the same firm are the Gordon sleeve protectors, Gordon luggage carrier, or bag, Gordon automobile top hood, Gordon tire hands, Gordon automobile cape aprons and plain flat covers, also Gordon tool and inner tube cases and "fits all" lamp covers. All of these specialties are made of various grades of fabric and in a number of sizes to fit standard requirements.

GORDON TIRE COVER.

The Vacuum Muffler.—Although not differing outwardly from the usual type of muffler, the "Vacuum" made by J. A. and C. A. Xardell, of Utica, N. Y., is constructed on an entirely different principle. The interior is divided into two chambers; in the first the force of the exhaust is utilized in such a way as to create a partial vacuum, and in the second the noise of the explosions is muffled. The vacuum chamber acts to increase the freedom of the exhaust and clear the cylinder more completely of burnt gases. The mufflers are made in two sizes, for engines of above and below 15 horsepower.

Kempshall Non-Skid Tires.—This is a patented tire of English manufacture, for which Cryder & Company, Park avenue and Sixty-third street, are the American agents. As will be apparent from the accompanying illustration, its chief feature lies in the peculiarly formed tread which differs radically from anything of the kind previously brought out, and which is said to make this tire superior to the usual steel-studded type as a preventive of side-slip and skidding. The tire itself consists of seven layers of special fabric interposed between layers of

THE KEMPSHALL NON-SKID TREAD.

rubber, the manner in which the pile is firmly united into one integral whole being the subject of another of Mr. Kempshall's numerous patents. Owing to the increased amount of radiating surface, the Kempshall tire is said not to heat to the same extent as the ordinary type.

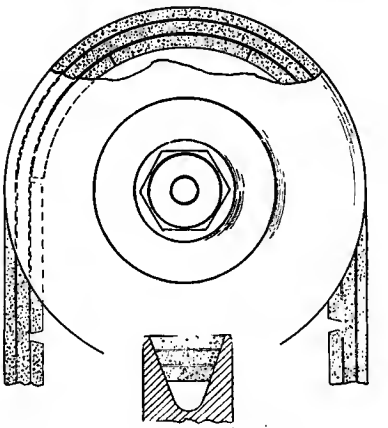
Front Springs for Fords.—As a means of improving the forward suspension of the Ford runabouts, the Special Motor Vehicle Company, 223 East Fourth street, Cincinnati, O., has just brought out what they term "Shumard's front springs for Ford runabouts." These are of the usual full elliptic pattern and are supplied complete with all the necessary fittings for placing on the car, while the makers also supply detailed instructions so that the majority of autoists who are able to handle simple tools will find the operation one that easily lies with the scope of their mechanical powers.

"Michigan" Planetary Gears.—These are the product of the Michigan Automobile Company, Ltd., Kalamazoo, Mich., and are designed for either chain or shaft drive. Type K is made for cars of 12 to 20 horsepower, while Type L is for lighter work, ranging from 6 to 12 horsepower, and is especially adapted to the use of the buggy type of car. Either is supplied with the sprocket next to the flange of the main shaft and the clutch cone on the opposite end, or vice versa. The gears can also be made to fit a desired location by providing different lengths of shaft, different sizes of flanges and also different sprockets. The Michigan company is licensed to manufacture planetary gears of this type under the Ball patents, and their specialty is turning out large quantities to manufacturers' specifications, their plant being particularly adapted to this purpose. They are also

POPULAR-PRICED PREST-O-LITE TANK.

large makers of special designs of transmissions, jackshafts, rear axles with chain or bevel gear drive, and a combination of these various parts, as well as sliding gear sets of the selective type. The company is also in a position to turn out gasoline motors of from one to six cylinders. Some of the details of the Type K planetary gear will be of interest. The main shaft is drop-forged from 35 to 40-point carbon open hearth steel of best quality, and is made integral with its flange. It is hardened, as is also the cone, made from machine steel, while the gears are turned out in the same manner, and are all bronze bushed; the clutch dogs are of hardened tool steel. The clutch plates are of steel, cast iron and red fiber; they are of good size and afford ample friction surface.

Challenge "V" Type Belt.—This is one of the products of S. F. Heath & Company, 288 Columbus avenue, Boston, Mass., and is specially offered for motorcycle and automobile use. They are made of specially selected hides, tanned by a secret process to produce the maximum tensile strength, and they are not only waterproof, but also resist the action of steam, oil, gases and alkalies to a remarkable extent. The permanent stretch of a Challenge belt in service is so little and their power of re-



HEATH'S CHALLENGE "V" TYPE BELT.

covering their normal tension when idle is so great that any slackness is usually taken up after a short rest, usually over night. As they are specially designed to prevent slipping, no idler is required. For the transmission of power on the motorcycle and for fan use on the auto the makers claim that they have no superior. The same company also supplies belts of the flat type, using the special Challenge leather.

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Robert Instrument .....
Royal Equipment .....
Rushmore Dynamo .....

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Schug Electric Co. .....
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Sireno Co. .....
Siro Carburetor Mf .....
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Spacke Machine Co .....
Spare Motor Wheel .....
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Standard Automati .....
Standard Co. .....
Standard Connectin .....
Standard Welding .....
Stanley & Patterso .....
Star Speedometer .....
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Stevens-Duryea Co .....
Stromberg Motor .....
Studebaker Automo .....
Success Auto Buggy .....
Supplementary Spir .....
Swinehart Clincher .....
Syracuse Alum. & .....

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Thompson Sons Co. .....
Timken Roller Bear .....
Torbensen Motor C .....
Tray Plate Battery .....
Trebert Gas Engine .....
Trenton Rubber Mf .....
Tucker, C. F. .....
Tygert Co., E. A. .....

Uncas Specialty Co .....
Utility Co. .....
U. S. Fastener Co. .....

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THE AUTOMOBILE

22 Winnipeggers Have an Endurance Run: 4 Perfect Scores

Start of the Annual Endurance Run of the Winnipeg Automobile Club, the Most Successful in Its History.

WINNIPEG, MAN., Aug. 25.—The Winnipeg Automobile Club's annual endurance run for 1908 took place from August 15 to 18, over an extremely trying course, 425 miles in length. Twenty-two cars were entered for the event, as follows:

Oldsmobile, J. Maw.	McLaughlin, Chas. Newton.
Oldsmobile, John Moran.	McLaughlin, R. McKenzie.
Oldsmobile, D. B. Sprague.	McLaughlin, W. Sweatman.
Oldsmobile, D. Glasgow.	McLaughlin, Harry Gooderham.
Oldsmobile, G. Walker.	McLaughlin, P. C. Hagarty.
Oldsmobile, T. Louden.	McLaughlin, W. Borebank.
Oldsmobile, G. A. Mitchell.	Russell, W. E. Wright.
Oldsmobile, F. Raynsford.	Russell, Canada Motor Co.
Packard, Mrs. E. Nicholson.	Royal Tourist, W. R. Bawlf.
Packard, Hon. Robt. Rogers.	Buick, E. Patterson.
Cadillac, Russell MacLeod.	Mitchell, F. R. Newman.

The different makes of cars represented being divided as follows: Packard, 2; Royal Tourist, 1; Russell, 2; McLaughlin, 6; Oldsmobile, 8; Mitchell, 1; Cadillac, 1; Buick, 1.

Four cars finished with an absolutely perfect score, they being:

Mrs. Nicholson's Packard.

Hon. Robt. Rogers's Packard.

W. E. Wright's Russell.

J. Maw's Oldsmobile.

The judges in making their award decided that these four cars should be asked to go through a further trial in order to decide the winner of the Oldsmobile trophy and the silver cup which goes to the car taking first place, and another cup presented for the second. This will in all probability be run off on September 5 and 6, the two days preceding the date fixed for the Dunlop trophy race, which is a speed event and is scheduled for September 7.

How the Tour Progressed from Start to Finish.

The twenty-two cars left Winnipeg at 8:40 A.M., August 15, the first day's run being to Brandon, distant 142 miles. All the cars made the trip without trouble except with tires, with the exception of G. Mitchell's Oldsmobile, which broke the hub gear on the driving wheel and was held up until a new wheel was obtained from Winnipeg, the car coming on after repairs had been made, rejoining the main body at Brandon on Sunday morning and finishing the tour without any further trouble. The route during the latter portion of Saturday's run was of a very trying nature, being of a very up-and-down character, the road surface being loose and sandy, making the work on the engines of an extremely arduous nature. Sunday was spent in Brandon, not being included in the tour proper.

Monday the start from Brandon was fixed for 8 o'clock sharp, and prompt to time all the cars were in position waiting for the pathfinder to get ahead of the main body. During the wait Mayor Clements of Brandon, accompanying A. W. Elliott of Brandon in his Chatham car, joined the tourists and a big Thomas touring car loaded with prominent citizens of Brandon was also in evidence for the purpose of escorting the tourists on the first twenty miles of the day's run.

Twenty-two miles from Brandon, the home of W. Carroll, M. P. P., "Father of the Manitoba Motor Act," was reached, and here the tourists met with a most hearty reception, which included refreshments. This act of courtesy was highly appreciated by the tourists, showing as it did the large-minded manner in which automobilists are treated by the farming class, of which Mr. Carroll is a most prominent figure. In fact, all through the tour the farmers along the route suspended their harvesting operations to cheer the tourists as they passed by.

Newton's McLaughlin came to grief between Minto and Boissevain, with a connecting rod seized, due to overheating, but the repair car with its excellent staff of mechanics managed to get him running again inside of five hours and both cars caught the crowd before the completion of the day's run.

There Were Numerous Receptions En-Route.

During the afternoon run receptions were the order of the day, nearly every town that was passed through having a reception committee on hand to welcome the tourists and invite them to participate in some form of entertainment, that at Killarney being to a trip on the beautiful lake by steamer, while at Pilot Mound a magnificent bouquet was presented to the lady in the leading car by the ladies of the town, and an excellent light supper provided for the whole party. The time lost

Mrs. E. Nicholson's Packard. One of the Perfect Scores.
Finished with a perfect score in Winnipeg Auto Club's 1908 Endurance Run for Olds trophy. This car left Winnipeg, August 25, for a tour from Winnipeg to New Orleans, going by road throughout.

on the running schedule caught the tourists in the dark with still twenty miles to cover, including a long climb of nearly two miles in length, the steepest part of the grade being about 1 in 7, with several sharp curves rendering the task of successfully negotiating the hill a matter of skilful driving to prevent stalling the engine. It is doubtful whether any of the hill climbs in the United States could compare with this particular hill for stiffness, and it is the intention of the Winnipeg Club to hold a hill climbing contest on this hill at an early date.

When the cars arrived at Larivere at 9:45 P.M. the townspeople had a huge bonfire lit in order to obtain a good view of the cars as they arrived, and the tourists were once more greeted with an address of welcome, which with the acknowledgment on behalf of the Winnipeg Club by President Russell MacLeod, delayed the run for another 20 minutes, making it past 11 o'clock before the night control at Manitou was reached. In spite of the late arrival the whole town was out waiting the arrival, and as the hotel accommodation was insufficient to meet the demand the citizens came to the rescue, the tourists being provided with sleeping accommodation in their homes.

The home run was fatal to the chances of quite a number of competitors owing to broken springs, W. R. Bawlf's Royal Tourist and Dr. Glasgow's Oldsmobile benig among those falling from this cause. The remainder of the run back to Winnipeg was covered without incident, beyond the decorating of each car with wheat sheaves obtained from a farm about 15 miles out.

Eighteen of the twenty-two cars finished at the *Free Press* office at 7:35 P.M., their arrival being welcomed by a big crowd.

POPE-HARTFORD LEADING WINNER MINNEAPOLIS CLIMB

MINNEAPOLIS, MINN., Aug. 30.—One distinct winner was evolved yesterday in the annual hill-climb of the Minneapolis Automobile Club, which is something unique in the annals of this style of motor competition and which at the same time will prevent many from making claims not borne out by facts. In doing this the "Gophers" used the Chicago Motor Club formula, which brings out motor efficiency, the handicap being based on piston area multiplied by time and divided by the weight of the car. Using this formula, the officials of the contest formally awarded the chief prize in the test, the Minneapolis *Journal* $1,000 trophy, to H. J. Clark, an amateur driver, whose 27.2-horsepower Pope-Harford showed best under the formula, its percentage figures of 3.53 being the lowest of the fifteen cars that competed in the bandicap events. As figured under the formula the cars were rated as follows:

Car.	H.P.	Driver.	Pct.
Pope-Hartford	27.2	H. J. Clark	3.53
Corbin	32.4	Gordon Bird	4.21
Buick	22	C. Nyquist	4.30
Buick	22	D. W. Onan	4.52
Overland	19.6	B. Fawkes	4.50
Stoddard-Dayton	36.1	A. C. Miller	4.73
Rambler	32.4	E. Sampson	4.90
Jackson	22	W. G. Benz	4.95
Ford	22.5	G. Dorr	5.09
Ford	22.5	W. E. Wheeler	5.18
Pierce-Arrow	60	P. Hofmann	5.50
Overland	19.6	L. Bousfield	5.84
Holsman	12.4	W. C. Rader	6.547
Schacht	14	H. B. Allen	6.599
Rambler	20	J. B. Lee, Jr.	7.44

Eight classes were provided for and in these there were twenty-four contestants. Four of them were handicap events and the others were decided on straight time, the results being as follows:

CLASS A, MOTOR BUGGIES, HANDICAP.

Car and driver.	Time.	Pct.
Holsman, W. C. Rader	:72	6.547
Schacht, H. B. Allen	:80.4	6.599

CLASS B, HANDICAP.

Buick, C. Nyquist	:44 2-5	
Buick, D. W. Onan	:46	4.52
Overland, B. Fawkes	:50	4.60
Jackson, W. G. Benz	:51 3-5	4.95
Ford, G. Dorr	:47	5.09
Ford, W. E. Wheeler	:49 4-5	5.18
Rambler, J. B. Lee, Jr.	:78 4-5	7.44

CLASS C, HANDICAP.

Pope-Hartford, H. J. Clark	:43 4-5	
Corbin, G. Bird	:33 2-5	4.21
Rambler, E. Simpson	:45 4-5	4.90

CLASS D, HANDICAP.

Stoddard-Dayton, A. C. Miller	:35	4.73

CLASS E, HANDICAP.

Pierce-Arrow, P. Hofmann	:37	5.50

CLASS F, FREE-FOR-ALL.

Pierce-Arrow, P. Hofmann	:38 3-5

CLASS G, FREE-FOR-ALL.

Corbin, G. Bird	:33 2-5
Stoddard-Dayton, A. C. Miller	:35

CLASS H, HANDICAP.

Pope-Hartford, H. J. Clark	:43	3.47
Overland, L. Bousfield	:64	5.84

CLASS I. FREE-FOR-ALL.

Moon, G. H. Seeley	:47
Rambler, J. B. Lee, Jr.	:81 4-5

OPEN RUN AROUND LONG ISLAND TO TEST STOCK CARS

BY way of demonstrating the running qualities and mechanical efficiency of fully equipped stock cars of the various models that may be entered, the New York Automobile Trade Association is to promote Wednesday and Thursday, September 16-17, a combined road test and pleasure run around Long Island.

Roughly estimated, the two days' tour will cover some 275 miles. The first day the course will be along the south shore of the island, with a noonday clambake at Blue Point and a mammoth ox roast at Montauk Point, the night stop. On the return trip the caravan will cross to the north shore from Good Ground and stop for luncheon at Riverhead.

The cars will be divided into six price classes, with an added class for taxicabs carrying two passengers and a driver. The classification will be: Class A, $850 or less; class B, $851 to $1,250; class C, $1,251 to $2,000; class D, $2,001 to $3,000; class E, $3,001 to $4,000, and class F, $4,000 and over. The taxicabs will be grouped under class G. The classes will be further subdivided according to their passenger-carrying and load capacity. There will be a liberal time schedule and time limit.

The management of the run has been placed in the hands of W. J. Morgan and the working out of the technical details has been entrusted to Alex. Schwalbach, who as secretary may be addressed at the Thoroughfare Building, Broadway and Fifty-seventh street.

OVER THE ALLEGHENIES FOR A FAST TRY-OUT

By A MODERN TRAVELER.

LAST Thursday it took S. D. Waldon just 15 hours 58 minutes to drive a 1909 Packard car from Pittsburg to Philadelphia, thereby smashing the automobile record between those cities by a couple of hours. A generation past it took the rolling, jolting stage coach fifteen to twenty days to make this same 304-mile journey over the Alleghenies.

Times have changed and travel has changed, but the old Forbes military road, built more than a century ago across Pennsylvania, has changed but little. The wildly curveting stage, hitting the high spots as it bumped roughly and recklessly over the mountains, is merely a dim recollection. The road itself is coming back into its own.

Along the road's eastern part the whole country has changed since the colonist generals engineered its making. Valley Forge

"Thank-You-Ma'ams" Were Numerous.

attained a place in history and became an everlasting memorial to Washington. Gettysburg attained a place in history and became an everlasting memorial to Lincoln. Philadelphia spread her metropolitan airs over the vicinity, and the Forbes road was graced with beautiful country estates and well-groomed suburban towns. The Pennsylvania Dutchman and the Quaker covered the road's original clay with macadam and dotted the hillsides with large barns and small houses. The trolley worked its way into the district and the toll-gate changed its program to make automobiles the topliner.

The western part of the Forbes road is the same old mountain highway. It is still a trunk line through a wild country, full of rattlesnakes, trees, and rocks, where wide perspectives have no trace of habitation, cultivation, or epulation. The road is an air line. It goes over the mountains as nearly straight as its builders were able to make it. In some places it is simply a traveled course on the naturally flat mountainside. In other places it is a shelf hewn with difficulty in the native rock. It is fenced with thick forest, except where it rises above the trees and sticks boldly out on top of some ridge or mountain crag. It rises in a steady ascent for 5 and 6 miles at a time, simply to run down into the next valley, which is valley only by comparison, because the lowest level is high above the sea. Almost all of the clay which originally surfaced the road has been washed away. For scores of miles the road is simply a trail of bed rock, littered with loose stones. Every two hundred feet there is an immense waterbar. These were put on the road originally to turn the course of water from heavy rains into the gutter and thus prevent the washing away of the road. The road has been long since washed away. The waterbars now keep the rains from washing the loose stones off the jagged rock foundation.

In the valley towns, whose only excuse for being seems the mere habit of existence, are taverns whose halls once echoed the boisterous merry-making of stage coach travelers; where the tavern keeper once poured bad wines down the dusty throats of thirsty stage drivers, at whose tables tired passengers once sat down to boiled dinners. Some of these taverns have obtained a new lease on life. The village loafer has been moved to the far corner of the bar to accommodate the begoggled motorist, down whose dusty throat the tavern keeper now pours bad whisky. At the tavern table the modern knight of the road feasts on fried chicken, apple butter, and other substantials of a period before the Astor butted into the hotel business, but not so long ago as to have been forgotten when a Michigan-made stove transplanted the original fireplace.

There is Old Joe at McConnellsburg, whose memory far exceeds his age and who recounts more traditions of these everlasting rocky hills than were ever set down in authentic history. He knows the man who invented the mighty brake with which the mountain wagons are held against perilous flight

Forbes Road Over Alleghenies Has Steep Grades.

down the steep grades, and he thinks he knows the exact dialogue between George Washington and General Forbes when they discussed the surveying of the highway. He makes a specialty of automobilists. Over 500 cars have passed through McConnellsburg this year. Joe has entertained nearly 300 parties and expects to exceed that figure by the time cold weather comes.

The man who sells everything from rattlesnake belts to self-rising pancake flour has added gasoline and cylinder oil to his list and is local authority on automobiles. He says that there have been more Packards over this route than any other car and that over thirty Packards passed through McConnellsburg during the last two weeks.

Mr. Waldon's record run was his third trip over this road. Each year the Packard Motor Car Company sends its cars over thousands of miles of the roughest roads in general testing and

On Top of Little Round Top at Gettysburg.

development work. The long, hard runs across Pennsylvania suggested the fitness of the Allegheny Mountain district as a permanent testing place. Consequently a Packard camp was established at McConnellsburg and three experimental Packards were put through their paces in that vicinity. For a fortnight these cars were driven by different members of the Packard executive staff, engineering department and men from the factory. Different parties of Packard dealers and several Packard owners were brought to the camp to see the cars perform over Cove Mountain and other difficult stretches of road in the vicinity. So successful was the work accomplished and so extreme was the test given the cars that the Packard company is preparing to erect a permanent garage on Cove Mountain, near McConnellsburg, as headquarters for future testing.

There had been no through trips from Pittsburg to Philadelphia and return until Mr. Waldon first attempted to drive a Packard over the road in one day. This summer he essayed to establish a record that would test the ability of the car in continued hard running over a mountain road, in whose entire 300 miles there is no chance for high speed running and on which a fast record must be made absolutely by steady plugging. The result is the present record, at which the automobilists who have traveled in this country marvel.

Mr. Waldon left Pittsburg at 4 o'clock in the morning with a party of five in a standard touring car. The first half century of the trip was made before dawn over that hilly, tortuous road leading to Bedford Springs, which is familiar to all of last year's Glidden tourists. From Bedford the course turns northeastward through the very heart of the mountains and then runs eastward through Chambersburg and Gettysburg to Lancaster, where it strikes the famous Lancaster Pike leading into Philadelphia.

The foothills of the Alleghenies begin immediately out of Pittsburg and our early morning ride was simply an unbroken struggle against grades and waterbars. The brakes had to be used on both sides of each mountain. For mile after mile the car would be tossed from "thank-you-marm" to "thank-you marm," until finally it reached the apparent top of some ridge, only to descend by an equally arduous road to the bottom of a valley, whence it would rise again through foothills and finally onto the last, long climb of the next mountain ridge.

When daylight succeeded Prest-O-lite, the view from each height showed in the hazy distance a long, blue bank on whose crest an occasional break in the forest marked where the road 25 miles away touched the clouds. "Beating it" between crests meant simply a continual zigzagging from one side of the road to the other in order to strike the waterbars obliquely and rise over them with undiminished speed but with lessened jolt. Up hill and down hill, it was the same steady 25 to 30 miles an hour. In one, two, three order the wheels slammed over the waterbars, the car was yanked straight again and then pulled to the right of the road to take the next obstruction.

There is no let-up in these waterbars. Two hundred feet apart they are like rough ties in a giant, railless railway between Philadelphia and Pittsburg. Even when the road swept down the eastern face of the last mountain ridge and into the rolling farmland of eastern Pennsylvania, even when the now leveller road became a comparatively smooth macadam—still the waterbars remained to check the flight. Record breaking continued just a persistent struggle against stubborn obstruction. Since 4 o'clock in the morning Waldon had stopped only while an exploded tire had been repaired and at noon to feed the car with gasoline. The human stomach had to be satisfied with a cold lunch carried in the car.

Occasionally a slanting pole across the road meant a toll-gate and a brief respite from the bouncing, tiring journey; occasionally a small village meant a brief respite from the unpopulated hills or from the wearisome quietude among the apathetic Pennsylvania farmers. Not until the refining influence of Philadelphia was approached and the Lancaster pike had become a boulevard through beautiful suburban villages was there a restful breath or an easing up of the tense attitude that had been taken to conquer the roughness of a highway which was built for stage coaches and seems to have a natural protest against its adoption by motor cars. Then the town marshal took the place of the waterbars and stood with almost the same frequency on the road, waiting to arrest progress if progress gave him the chance by violating speed laws.

Really a record run from Pittsburg to Philadelphia should end at the city line. It seemed that night, wandering into Quakertown over a smooth but uncertain way through Fairmount Park, that we were trying impatiently to get done with an anticlimax. The noise of a big city does not appeal strongly to the reactive nerves of a record breaker who has finished his job. His atmosphere is the wild hillside or the open road where the wind blows the dust across an astonished countryside. His hotel is the country tavern. His garage is the country hardware store, where gasoline is sold at prices that would make the Standard Oil Company blush with shame. His lights are the glaring headlights which peer into the darkness before dawn or the deep black of midnight and tantalizingly beckon him to go on faster and faster into the secret paths of the mountains.

There should be an inn at the city line; an inn for record breakers; an inn like we used to have in the old mediæval times when the knight errants rattled into a stone-flagged courtyard, jumped from tired horses and thumped into the great room where mine host set before them bread, meat and wine, according to the best style of historical novels—a room where they could loudly bang on the tables and, sprawling on crude benches, as loudly gabble over the happenings of the day. Enter then the record breakers, noisily:

"What ho, varlet! Meat not steaming on the board? Think ye that we, who have ridden since the cock crowed, a hundred leagues o'er yon accursed mountains in our valiant Packard, are not raving with thirst and nigh to perishing of hunger? We have smashed the record and right heartily would we eat. Beat it to the kitchen, you mutt."

Valley Forge Lies Close to Old Forbes Road.

Latest Doings of the Aerial Brigade

Attaching Ropes to Basket for Malecot Combination Airship.

PARIS, Aug. 22.—It is an easy job that the eight policemen and one brigadier have at the Issy-les-Moulineaux ground from 4 to 6 a. m. every day, for although the Parisian is naturally an early riser he is not equal to reaching this distant military ground at daybreak. Consequently the aeronauts can operate in that isolation that Wilbur Wright sighs for.

Captain Ferber, inventor of the Farman type of aeroplane, has been busy every morning with his new biplane, constructed and engined by the Antoinette company. Having been recalled to active service, the captain has made a gift of his new machine to M. Legagneaux, a young enthusiast, who after three trial trips succeeded in covering a distance of 280 yards under official observation, thus winning the third of the prizes offered for a flight of not less than 200 metres. The first two were won by Delagrange and Bleriot.

Ferber's machine, known as the *Ferber IX*, is a nearer approach to the Wright Brothers' idea than any aeroplane built in France. Its bearing surfaces consist exclusively of two superimposed planes. There is no tail; the elevation rudder is in front and the lateral rudder in the rear. On the first trials the balance was not perfect, the rear rudder too did not appear to have any power to bring the apparatus into the wind as it should have done, the aeroplane falling off whenever it was taken a point or two out of the eye of the wind. Starting is effected by means of a couple of pneumatic shod wheels in tandem and mounted on powerful hydraulic shock absorbers.

Gastambide-Mengin has the honor of being the first to rise in the air on a monoplane machine with two persons on board. The performance was made at Issy one morning last week, the distance covered being about 120 yards. The machine was engaged for the 200 metres competition, but was unable to run owing to the ground being closed at 6 o'clock just as the apparatus was ready to compete.

A New Aeroplane Recruit at Issy.

A new recruit at Issy, the tri-plane Bousson-Borgnis, failed to make a good impression on its first outing. The new aeroplane is a curious looking structure, having three curved, superimposed bearing surfaces with a strong resemblance to the wings of a huge bird. At the front are a couple of elevation planes also shaped like the wings of a bird. The entire apparatus is mounted on a stout carriage borne on three small pneumatic tired wheels, the driving power being a six-cylinder engine operating a four-bladed propeller at the rear through shaft and chain drive.

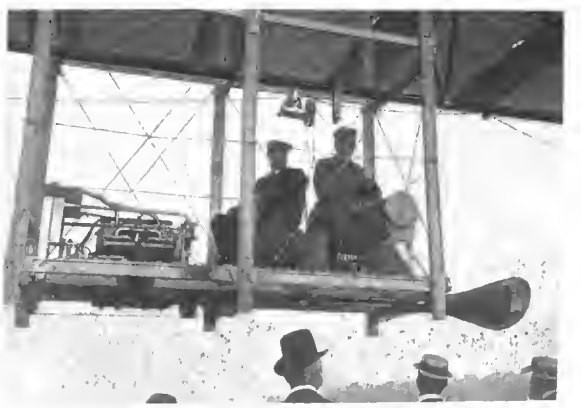
Sky pilots are seeking to escape from the annoying restrictions of Issy, the Antoinette company having already secured a training ground on an island in the Seine, some distance above Rouen. Here they have a length of about one mile by three-quarters of a mile, where no restrictions whatever are in force and which cannot be reached by inquisitive sightseers. Delagrange is looking for a private ground before resuming work and Farman will also make a change if possible.

An aeroplane section will be included in the Paris automobile salon this year for the first time. The section will be a purely commercial affair, only current models of aeroplanes and aeronautical motors as placed on the market being on exhibition.

Issy-les-Moulineaux now has a hybrid in the form of a cross between a dirigible balloon and an aeroplane, a production due to the inventive genius of M. Malecot. It consists of a cigar-shaped gas bag inflated with hydrogen and having a lifting capacity of 600 pounds, or sufficient to raise its machinery, two passengers and a small amount of ballast. But, unlike the ordinary dirigible, the Malecot machine does not depend entirely on the lifting power of its gas.

Immediately below the gas bag is the aeroplane portion, consisting of a couple of parallel planes running the full length of the lower part of the balloon and terminated by a vertical rudder. Below this again is an open wooden cage on the floor of which is installed a four-cylinder water cooled automobile engine, the installation and fitting of which is exactly similar to that of a car, with the exception that instead of driving a rear axle the propeller shaft bears a two-bladed propeller at its extremity. The pilot and mechanic occupy basket-work chairs just to the rear of the dashboard and still further to the rear is the gasoline tank on raised brackets.

Owing to the large bearing surface under the gas bag the apparatus naturally rises and descends vertically with a certain difficulty. Thus an ordinary balloon basket has been attached some distance below the engine cage, one rope going to the forward end of the frame, the other to the rear, and both passing over pulleys above the pilot's house. By these means the position of the basket can be varied sufficiently to raise or lower either the nose or the tail of the balloon and provide for ascent or descent. When sailing



Pilot and Mechanic in Malecot "Engine Room."

First Attempt of the Aeroplane Boisson-Borgries.

Ferber Aeroplane Driven by M. Legagneux.

on an even keel the basket is, of course, kept in the line of the center of gravity. This method of raising and lowering a dirigible balloon is similar to that adopted by the early sky pilots, with the difference that instead of a basket a heavy trailing rope only was employed; the method of shifting to alter the center of gravity is, however, the same.

Satisfactory trial trips were made over the Issy-les-Moulineaux ground this week and further trials are promised at an early date before a military commission interested in the balloon for army work. The claim made for this apparatus is that should the gas bag burst a gradual descent could be made.

PILOTS FOR AERIAL GORDON BENNETT.

PARIS, Aug. 27.—With the exception of one of the Belgians, all pilots have now been appointed for the Gordon Bennett balloon race to start from the suburbs of Berlin, Sunday, October 11. The list of sky pilots stands as follows: United States, Frank P. Lahm, McCoy and Forbes; England, C. S. Rolls, Prof. Huntington, John Dunville; France, Emile Carton, Jacques Faure, Alfred Leblanc; Germany, Oscar Erbsloh, Capt. Abercron and Dr. Niemeyer; Italy, Prince Borghese, Usuelli and Capt. Frassinetti; Switzerland, Dr. Beauclair.

BRITISH AIRSHIP FAIRLY SUCCESSFUL.

LONDON, Aug. 27.—The new British Army airship "Dirigible II," although a great advance upon the "Nulli Secundus," is still many years behind the French and German craft. It has been increased in size and some refinements in detail made, but there is still much to be done before a really practicable dirigible is evolved. It attained a speed of about twelve miles an hour on its trial trip, but was nearly wrecked returning to its shed.

FRENCH EIGHT-DAY TAXICAB TEST.

PARIS, Aug. 22.—A fixed course around Paris, starting from the Port Maillot, passing through Maisons-Laffitte, St. Germain and Versailles and finishing at the point of departure, has been selected for the eight-day taxicab and light delivery vehicle competition next October. The main reasons for keeping the cars on one course for eight consecutive days is to give an opportunity of more accurately controlling and comparing the consumption of the various fuels employed. In addition to a couple of days on gasoline, each competitor will have to cover the regulation distance on alcohol, white spirit and benzol, official observation being made of the quantity of each consumed. This should provide some valuable comparative figures on the cost of fuels, although alcohol can hardly be expected to give its best efficiency except in engines specially designed for its use.

By starting in the early morning and finishing at the same place in the early afternoon drivers and helpers will be able to return to their homes or business each day, a rather important consideration in view of increasing activities in the automobile trade on the approach of the shows.

Contrary to the usual plan of procedure in competitions, only one man will be allowed on each taxicab, hotel omnibus or delivery vehicle. The organizers declare that this step has been taken in order to remove the impression prevalent among business firms that two men are required to run an automobile. The plea is often put forth that mechanical traction is more costly than horse haulage because in addition to driver and delivery man there will be required a mechanic on the automobile, making three men where two are now employed. In the Paris competition all work must be done by the one man in charge of the vehicle, no outside help whatever either on the road or in the parking stations being allowed.

"Dirigible II," the New British Army Airship Making a Successful Ascent.

One of the Nearly Completed Stretches of the Long Island Motor Parkway, That Will be Used in Vanderbilt Cup Race.

KNOX ENTRIES FOR VANDERBILT—LIST REMAINS OPEN.

AMERICAN makers are beginning to wake up to the opportunities the Vanderbilt Cup race will afford for the demonstration of the speed and road qualities of their cars. A manufacturer hitherto not identified with road racing, the Knox Automobile Company of Springfield, Mass., sprang a genuine surprise this week by nominating two of its stock cars for the Long Island classic. Both are of the 1909 vintage and of the 4-cylinder type. Model M, a 48-50 horsepower machine, with 5 1-2 by 5 1-2 cylinders, is to be driven by Charles S. Basle, who scored records for H. L. Bowden at Ormond in his big Mercedes. Model O, a 38-40 horsepower car with 4 7-8 by 4 3-4 cylinders, will be piloted by William Bourque, who has been at Knox wheels in some hill-climbing contests.

The officials of the Springfield company had the speed possibilities of the Knox impressed upon them by the performances of their 1909 cars at the Wildwood, N. J., straightaway races on August 3. At this meet Knox cars won 8 out of 10 events, scoring 47 2-5 seconds for the mile, a rate of 76 miles an hour, and 28 seconds for the kilometer.

In a trial for the Lowell race, however, Basle, over a measured mile, showed the Knox "M" capable of 81 miles an hour. The nomination of the Knox pair was made on September 1, the date originally set for the closing of preliminary entries. On that day, though Chairman Thompson, of the Vanderbilt Cup Commission, announced that the double fee originally intended to be charged for entries made after September 1 up to October 1 would not be exacted and that the fee for all would remain at $1,000. This action was dictated by diplomacy and the uncertainties of the racing situation at present. The chairman realized the fact that some makers desired more time to reach a decision and others would very likely follow the example of the Knox people and compete in the race with high-powered stock cars.

On the date originally set for closing the actual paid entries were a Mercedes, a Mora, an Acme, a Chadwick, and the two Knoxes. Entries of two Locomobiles, a Thomas, and a Roebling were promised and plans were on foot for the participation of the Pope-Toledo and Frayer-Miller Vanderbilt racers of 1906. Negotiations were also in progress for a Pennsylvania. A nucleus of thirteen cars was accordingly fairly well assured, with the claim that subsequent entries likely to be made by October 1 would raise the number of contenders to at least a score.

Robert Graves has secured Emile Stricker to drive the Jenatzy Mercedes, his original Vanderbilt entry. Stricker has been a Protos pilot in the last two Grand Prix contests. He was some years ago a demonstrator in New York City for the late Alexander Fisher, at that time importer of the Rochet-Schneider. To Stricker's instructions, it will be remembered, Louis Strang attributed his success as a racing driver. The Mercedes pilot is expected to reach this country next week and will at once take up his quarters at Mr. Graves' racing garage at Mineola.

The Vanderbilt Cup Commission is scheduled to meet to-day. Mr. Vanderbilt sailed yesterday and is due to arrive early next week. Important developments are expected to follow close on the heels of his coming.

The New York Club's contest committee is making extravagant claims for its proposed race at Savannah under European rules. Its chairman seriously puts forth the statement that the entry of 15 cars by foreign makers is assured. The only actual paid entries so far seem to be three Fiats, but claims of entries promised by other importers are made and that the nominations of three Garfords, a Stearns, a Lozier, a Chadwick, an Acme, and a Pennsylvania are assured.

"If all those European racing cars are actually to be on hand," remarked an American maker, "then it strikes me that American manufacturers who send stock cars way down to Savannah with strong chances of being merely 'also rans,' are fit candidates for the easy mark class. The chances for efficient demonstration and wide publicity on a metropolitan course offered by the Vanderbilt race are so incomparably greater than the remote possibility of scoring against the foreign racers at Savannah that I marvel at an American maker hesitating for a moment in making his choice."

LOWELL'S INTERNATIONAL LABOR DAY ROAD RACE

LOWELL, MASS., Sept. 1.—Until next Monday evening this city will be the center of motoring interest in New England, and the citizens are already basking in the illumination of publicity which even their world-famous cotton mills could not bring them. It remained for the automobilists to bring Lowell into the public eye by means of the 250-mile road race which is to be held Labor Day on a ten-mile circuit in the outskirts.

When it was first proposed to hold a race the citizens were a little slow in taking to the idea, but when President John O. Heinze, Vice-President Frank S. Corlew and other officers of the Lowell Automobile Club overcame seemingly insurmountable obstacles and at last made the race a certainty, the people took up the idea with enthusiasm and they are preparing to entertain a host of visitors on Monday. Capacious grandstands have been erected to seat the spectators, and the transportation companies are preparing for the biggest rush they ever experienced.

Nine cars are now entered for the race for the Butler Ames trophy. Of these six are American and three foreign.

The domestic manufactured competitors are two Knox machines, to be driven by Charles Basle and William Bourque; two Buicks, to be driven by R. Burman and C. S. Smith; a Simplex, to be driven by Frank L. Lescault, and an American, to be driven by A. J. Andrews.

The foreign competitors are two Isottas and a Fiat. The Isottas will be in the hands of Louis Strang and Alfred Poole, two of the Isotta team in the Briarcliff race. The Fiat driver is George H. Robertson, who drove a Panhard in the Briarcliff.

Most of the machines are already on the course, arrangements having been made so that they could be used for practice early each morning. The road has been put in good condition, the corners banked and the surface oiled. About half the course is over the boulevard, where the going is fine and upon the straight-away stretches of which maximum speed can be made. The rest of the circuit is made up of good country highways and city streets. There are enough difficult places to make the race exciting and to try the best of drivers. There is a hairpin turn and several sharp right-angle turns. The whole course has been wired off and the club proposes to collect an admission fee of nearly everybody who sees the race.

The police are coöperating with the club in the patrolling of the course, and Monday there will be strong details at the most congested points. For the remainder of the course special deputies are being sworn in. There will be a telephone circuit around the course and the usual couriers and flagmen. There are no railroad crossings, and at the point where the street cars touch the course the service will be discontinued while the race is in progress.

SAN ANTONIO'S "12" WON BY STODDARD-DAYTON

SAN ANTONIO, Tex., Aug. 29.—The 12-hour endurance contest held on the fair grounds track last Saturday was won after some fast work by David Pryor's Stoddard-Dayton, with Studebaker and Mitchell as runners-up. The track was only

Stoddard-Dayton Winning the 12-Hour at San Antonio.

three-quarters of a mile long, and without banking at the corners, but good time was made and no accidents marred the day. It is believed that the twelve-hour race will become a popular form of contest, as it is almost as good a test of endurance as the 24-hour, and has the advantage that it is all run during daylight hours, rendering the lighting of the track unnecessary.

Five cars started when the gun was fired at 7 A. M. The Stoddard-Dayton, driven by De Hymel, a youth of only 18 years, took the lead at the start with a fine burst of speed, and then settled down to a regular schedule, covering lap after lap in 1:10, without varying more than two-fifths of a second. At one time he had a lead of 35 laps over the nearest competitor, but this was reduced to about nine at 5 P. M. on account of tire trouble. From then on he gradually drew ahead until at the finish he was 14 laps to the good. The Chalmers-Detroit roadster made the fastest lap, in 55 seconds, but sprung its rear axle and was withdrawn to avoid an accident after covering only 94 laps. The Studebaker put up a good race and finished only 14 laps behind the winner, in spite of the fact that it carried a touring body and had only 30 horsepower to the Stoddard's 45. The score was kept on Burroughs adding machines. Each time a car crossed the line the judges called out its number and the scorer pushed the lever of the corresponding machine. This method proved entirely satisfactory, and not the least whisper of a protest was heard. The summary follows:

Car.	Owner.	Driver.	Score.
45 h.p. Stoddard-Dayton..	David Pryor..	De Hymel....	574 laps
30 h.p. Studebaker.....	Staacke Bros.	Van Tine.....	560 "
30 h.p. Mitchell.....	D. G. Robbins	W. A. Marsh.	539 "
20 h.p. Mitchell.....	D. G. Robbins	Withdrawn*..	174 "
40 h.p. Chalmers-Detroit.	A. Calkhurst.	Withdrawn†..	94 "

*Ignition trouble. †Sprung axle.

MOTOR RACING ASSOCIATION INCORPORATES.

New York tradesmen interested in the promotion of the two-days' race meet at Brighton Beach, September 11 and 12, have incorporated the Motor Racing Association with a capital of $2,000.

The full complement of 16 starters in the 24-hour race, which is to be the star feature of the meet, seems assured. Harry S. Houpt, New York agent for the Thomas, has promised his associates to supplant the two Thomas cars ordered withdrawn by E. R. Thomas, with two machines of his own, one a stock car to be taken from the floor and the other the machine which Montague Roberts drove victoriously in last year's 24-hour race at Brighton Beach.

It transpires that two men of considerable prominence in their A. A. A. affiliations appeared among the officials on the entry blanks. One of them was Charles Jerome Edwards, president of the Long Island Automobile Club, who was named as a referee; and Charles J. Swain, of the Quaker City Motor Club, who was set down for a judge. Both are absent on pleasure or business trips. Both, on being informed of the use of their names, made haste to send declarations that they were used without authorization.

CAMERON AND BUICK IN LIGHT CAR RACE.

Two more American makes of light cars are assured of representation in the race for this class the Automobile Club of America proposes to run on the day before its contest at Savannah for big cars under European rules. A 4-cylinder Buick will be driven by Edward A. Hearne of Chicago. The Cameron Car Company of Beverly, Mass., writes that it will enter one or more air-cooled cars as it believes that for the first time in the history of competitions of this description, an opportunity is afforded "to demonstrate to the public and trade the relative merits of air- and water-cooling systems for use in light cars." There is a call for a light car race on the Vanderbilt Course, and one may be arranged.

A BUILDING LOT FOR A RACE PRIZE.

Wildwood-by-the-Sea, N. J., Sept. 1.—The Labor Day meet of the Motor Club of Wildwood will doubtless attract all the owners of fast cars in the East, who will come with the object of pulling down a neat bit of plunder in the shape of a $1,000 Wildwood Crest building lot (all improvements made), which the Race Committee has hung up as an incentive to speed.

What the Fair Autoist Now Wears

Striped Silk Rubberized Auto Coat with Auto Silk Veil.

WHILE the enthusiastic autoist never really loses interest, it is everywhere acknowledged that the real season for automobiling begins in September. And so widespread has become the active interest in automobiling throughout the country, and so numerous are the members of the gentler sex who can intelligently discuss the merits and demerits of a car, and do not hesitate to undertake a long tour through a section of country of which they know little aside from the facts that its roads are rough and its inns of uncertain quality, that it is not surprising that the question of suitable garb should have become one of vast importance. Certain it is that the woman who wishes to travel in comfort appreciates the necessity of providing herself with an outfit which will not only perfectly protect her from dust and cold, but will enable her to always present a smart, trim appearance.

For the earliest weeks of Autumn, when the days are still warm, the best sort of motoring coat is one of the rubberized taffetas or English mohairs, which are to be found in every imaginable shade and pattern, notably the wide stripes and checks now considered so smart in tailored suits. These coats are made up in various ways, although invariably long and loose, but not so roomy as to utterly disguise the lines of the figure, as was the case in the earliest models. There is, however, a marked change in the sleeves of the newest coats as compared with those made a few months ago, which it behooves every woman to carefully note. This change is due to the very radical differences between the gowns of this year and last—the Directoire influence having so marked an effect upon the sleeves of every garment that to wear anything savoring of the balloon order is to frankly announce one's self as being behind the times—from a sartorial viewpoint. This is not saying that automobile coats have tight sleeves, for that would be an absurdity that no woman of taste would tolerate. The majority of them, however, are of the modified coat order and are put into the armhole without an atom of fullness, precisely as are the sleeves of the coats worn by men. Beyond this feature and the fact that pockets are larger and more prominent than heretofore, these rubberized medium weight garments show few changes, for the satin and silk neckties worn last Spring are still in evidence and so are the contrasting satin insets on the collar and cuffs.

In the realm of cloth motoring coats, there are several fabrics employed which heretofore have not been in general use for that purpose. One of these, and a material, by the way, which is considered immensely smart abroad, is the rough-faced English tweed in London smoke gray which has almost invisible stripings of black, and another is chinchilla cloth which, while undeniably a cold-resister, is rather too weighty to appeal to some women. The cloth motoring coats are of both three-quarters and full length, and a feature of their treatment is the perfection of the tailor-finished edges and the manner in which the bulk is taken from about the hips by means of the cleverly sloped side forms. While the cloth coat, like the lighter one of mohair and silk, has double-breasted fronts, its back may be made many inches narrower and in fact many of them are almost semi-fitting, although not in the least suggesting tightness. Some of these heavy cloth coats, and especially those brought over from London and Paris, have detachable hoods and capes of the same material, so that in some climates they will do duty all winter, especially if the cape, as is often the case, is fur lined. A coat which is a compromise between cloth and fur, in that it possesses attributes of both types, is a heavy double-faced English tweed made on the conventional lines of the ulster and supplied with an exceedingly high collar lined with otter and wide cuffs of the same fur. This is an ideal garment for mid-autumn and cold evenings, as the throat and forearms—most vulnerable parts of the body—are adequately protected.

The woman who is nearly related to the owner of an automobile and yet has not the income to warrant the purchase of a varied assortment of long coats, would best purchase a practical garment of rough cheviot, which may be worn on street, railway,

New Veil in Two Sections.

English Tweed Coat.

Hip-Length Sweater.

steamer or motor. Naturally such a utility coat should not be very weighty, owing to the discomfort of walking about in it and the fatigue involved by carrying it. Nevertheless, it may be very smartly lined throughout with striped silk or satin, have one of the new deep hoods, tassel trimmed, and a detachable shoulder cape of several sections. To provide additional warmth when necessary, every woman contemplating a motoring trip should provide herself with a sweater. The latest designs in these garments are so attractive, and withal so practical, that they will instantly appeal to the woman who wishes to be garbed becomingly as well as comfortably. These auto sweaters, as they are termed, actually extend half way to the knees and cling so closely that their presence is not detected even underneath a semi-fitting coat. The daintiest of these are in white with dark brown or blue borders, which also furnish the color scheme of the turn-over collar and deep, closely-fitting cuffs.

For some occasions, such as a race meet or a hill climb in a fashionable locality, it is necessary to wear a hat of as dainty character as possible, commensurate with the sport. Many women, after long—and costly—experiments with motoring headgear, have fallen back upon the dust and rain-resisting Panama, which is also incrushable and so flexible that it may be bent wherever desired. They will continue to be worn until snow flies. Their most effective trimming consists of scarfs, ribbon chou, wheels or bows, all secured with Japanese pins, or merely fancy feather clusters.

The smartest motoring headgear is undoubtedly the visored cap which precisely matches the coat, but the most comfortable and the type much affected at this season by women who take long tours is the silk baby hood over which is tied a mask veil fitted with isinglass eyes. The double veil is now so generally used with motoring garb that almost every woman knows that it must be so arranged over the hat crown that there shall be four ends—one pair falling forward and the other backward. When these are crossed there is no possibility of the hat becoming disarranged even in the strongest wind.

TEXAS ABOUNDS IN IDEAL NATURAL MOTOR PARKWAYS

MIDLAND, Tex., Aug. 31.—It is only three years ago since Midland saw its first automobile, and now there are 41 owned here by official count, with the prospect that this number will be more than doubled by the end of the year. The majority are touring cars, and are used to carry family parties, mail, and groceries to and from the outlying ranches. "Outlying" means anything from 20 to 150 miles away from town. But who would not want to own an automobile when he can drive 98 miles over an absolutely level stretch of road without an obstruction as large as a pebble? Such is the Lone Star auto route to Seminole, Tex. This is not merely the name of a road, but of an official mail route as well. It was established September 16, 1907, and has not missed a daily trip since, which helps to explain some of the chief charms of the auto roads of this part of Texas, as they are in equally good condition the year round.

The car carries five sacks of mail a day, and Seminole now gets letters in five hours that formerly took seventeen. Other routes are to Shafter Lake, Andrews, and Monument, N. M., the first-named now geting mail within nine hours that formerly took two days. The pony express may be still an attractive feature of Buffalo Bill's show and still retain its romantic side, but it is very much out of date in this part of Texas now. Throughout the entire distance to Seminole the surface of the road is just sufficiently sandy to prevent the formation of mud after a rain, and there is not a single bog hole or creek to cause a halt. Midland has another star auto road besides the one to Seminole; it leads to Five Wells ranch, Gaines county, and is 45 miles long.

The stunts of the old pony express riders are mere child's play beside the everyday performances of R. L. Slaughter, Jr., a 16-year-old boy who sees that Uncle Sam's mail pouches are safely carried between Midland and Seminole. The trip is made once a day in each direction, consuming five hours, or an average of about twenty miles an hour. There may be no holes and no creeks, while the lack of stones is remarkable, but there are fences and a barb wire fence is not the easiest thing in the world to take an automobile through by any means. Up in the Panhandle end of Texas there are auto stages, too. One of them runs to Roswell, N. M., and it has to cross quite a few barb wire fences. To get over them, what are probably the cheapest and easiest erected bridges for the weight to be carried that can be found in this country, are built. They simply consist of two light troughs built of planks, and sloping up one side of the fence and down the other.

Young Slaughter of Midland knew of the bridge plan, but did not like it, so he invented a fence crossing of his own. At every barb wire barrier a pit, six feet deep, four feet wide and eight feet long, was dug, the pit running in the same direction as the length of the fence. Across it are laid two planks, measuring 2 by 10 inches, an upright, or flange, being nailed to the inside edge of each plank to prevent the car leaving its track. The planks are laid on the same level as the road on either side, so that there is no necessity for slowing down as is the case where the car has to climb the fence. It is a hair-raising experience to make one of these crossings at full speed. With the car going at a good 25-mile an hour gait, which is much faster than most trains run in western Texas, a barb wire fence appears dead ahead. There is no gate or passage, and one begins to wonder how the car is going to get through. Then the pit with its narrow planks looms up and even the tough-as-hide cowboy bites his cud hard and sits tight waiting for what is going to happen. A flash and the front wheels of the car are on the narrow boards, and practically before one has a chance to look down into the pit the crossing is behind and fading in the distance. It seems so easy after it is all over that the passengers think it is a good joke, but there are fifty such crossings between Midland and Seminole, and the first time he makes the trip the passenger feels worried every time he sees one of them. Although these crossings are always taken at high speed, there is no record of a car ever having been piled up a wreck in one of the pits.

The ranchman is beginning to appreciate the automobile, and dozens are now used by owners of ranches living anywhere from thirty to eighty miles from Midland, making regular trips back and forth three or four times a week. As a result, Midland now has three good garages and a fourth is in sight, while the next development will be an automobile club. Plans are now on foot for an auto stage line from Seminole to Roswell, N. M., a distance of 268 miles from Midland. Both of the towns will carry out its share of the work; 160 miles of the route are already in use, so that it is expected that autos will be running through from Midland to Roswell in a few months. After that Midland autoists will try to establish connections with Dallas and Ft. Worth.

YE SCORCHERS OF YE OLDEN TIMES.

A correspondent of the London *Times* found this entry in the records of Parliament under the date of June 10, 1816:

"The attorney general moved for leave to bring in a bill, the object of which was the protection of the lives and limbs of His Majesty's subjects by correcting the enormous abuses of stage coach drivers. Within these few days it would be hardly credible what a number of applications he had received on this subject. Some of the accounts were enough to freeze one with horror. A gentleman of veracity had informed him that on Tuesday, the 21st of May, at 5:30, the Trafalgar and Regulator coaches set off from Manchester and got to Liverpool twenty minutes after 8, doing this journey in two hours and fifty minutes at the rate of twelve miles an hour."

Doesn't it sound familiar?

THE DIRECT INJECTION OF MOTOR FUEL

By THOS. J. FAY, E. E., President Society of Automobile Engineers.

WHILE it is true the direct injection of fuel into the combustion chamber has not been favored in the past, it is something of a question if, in the course of events, this mode of the utilization of fuel may not be taken up. Irrespective of the fact of its future application, there are points of interest to be noted, and it will be advantageous to discuss them. In order that the matter may be better understood, it will be necessary to go back over the ground, as it will be remembered that carburetion was a very serious matter from the start.

Earlier attempts to employ liquid fuel were in connection with carbureters of the "lake" type, in which a pool of liquid fuel was so situated as to intercept the inflow of air, with the expectation that the air would become saturated with the hydrocarbon and thus become an explosive mixture. Expectations were realized, in a way. The air did pick up the hydrocarbon, and the mixture was to a certain extent adaptable. It was not uniform, however, nor was it possible to utilize all the liquid fuel put into the receptacle at any one time, for reasons that we now know more about.

Nature of the Distillate Was Largely Responsible.

To begin with, it will be necessary to discuss the characteristics of the fuel used, to understand why all of it was not picked up by the air as it passed over or through the fuel, as the case may have been (there were several detailed methods), on its way to the combustion chamber. The fuel exclusively used at that time was of the "olefiant" hydrocarbon series, distillates of crude oil, in fractional form. The product was delivered on a basis of specific gravity, and the lighter distillates were selected for the purpose. The lighter distillates afforded the most uniform mixture, and it was then thought that the failure to realize a uniform mixture for all the gasoline in the container was due to the failure of the vendors of the gasoline to deliver what the specifications called for.

The fundamental difficulty was overlooked, for the most part, on account of lack of knowledge of the peculiarities of the fractional distillate, and, furthermore, in consequence of the very crude nature of the devices used. It dawned upon the pioneers in the course of time that the fractional distillates of crude oil were defective for the purpose, in that the components were not all of the same degree of volatility. The more volatile portions were carried over first, during which period the carburetion was the most perfect. Then the mixture would become "leaner," and trouble would be rendered manifest.

By the time half the gasoline was vaporized the remaining portion would be so resistant as to render further action futile, and the motor would cease to perform its functions. Various designers resorted to diverse means to overcome the defect, but to no avail. It was in 1896 that the author took up the task of correcting the defects of the methods as here set down, only to find just what is here related, *i.e.*, the fault was in the gasoline, not on the basis as suspected by the then designers (failure to receive the gasoline of a specific gravity as ordered), but on a basis of difference in volatility of the components of the distillate.

Less Volatile Components Can Be Utilized.

One of the very first schemes for correcting the evil may have been the invention of "Raymond" (the author is not positive). The plan consisted in "spilling" the gasoline over a brass wire mesh, rolled up into cylindrical form, and causing the air to pass over and through the wetted wire mesh. For stationary work this scheme was the best of the time, insofar as the author can discern. The gasoline was pumped from a low to a high level and spilled over the wire mesh, while the excess ran back by gravity to the lower tank. The wire mesh was inclosed in a glass tube.

Even this scheme, as will be readily seen, failed in part, because the less volatile portions of the distillate would go by time after time, and in the end the residue piled up to a vast extent. At such a time, to remove the whole of the remaining gasoline and substitute a new supply was the only remedy. When the principle of the float-feed carbureter dawned on the minds of the engineers who were struggling with the ills of the earlier schemes it was at once to be seen that the less volatile products would be impelled with the more desirable portions into the combustion chamber. This proved to be a lasting benefit, and while the float has been done away with in certain types of carbureters, the principle remains, in that all the gasoline is passed into the motor.

It was thus proven that the less volatile products would serve as fuel were they properly handled, and in the main the value (relatively) was a matter of heat units contained in the fuel. It has been shown that the hydrogen component is of the greatest importance in the fuel, in that the increase in hydrogen rendered it possible to speed the motor, considering a given compression, because fuel rich in hydrogen possesses a low temperature of inflammation relatively to the other products of the compound. It is easy to see how hydrogen rendered the mixture easy of ignition and of a high rate of the flame propagation under conditions of bigh speed in which, unfortunately, the compression recedes.

The compression in the earlier types of motors was lower than it is to-day (1908), but the reason was well under the surface. The fuel of that time was richer in hydrogen than it is at the present time. The mixture ignited more readily and the flame propagation was more marked. Ignition troubles led to a higher compression. With higher compression the fuel problem was modified to some extent, but it is still an ever-changing bugbear. Because the fuel is not stable, either in the matter of quality or price, designs are influenced to a greater extent than one would be led to suspect.

Effect of the Height of Carbureter Float.

Liquid fuel is really delivered on a basis of its boiling point, and not with respect to its specific gravity. Volatility, then, is the measure of quality, since the calorific value does not vary very much in the several products as delivered. The difficulty likely to be experienced, in view of the method of procedure, lies in the fact that the limits of the boiling over (fractional distillate) process may not be so closely held as to assure reasonable closeness of volatility as between the components of the composition. In view of this and other facts to be disclosed lies the interest in the question of the direct injection of fuel into the combustion chamber of a hydrocarbon motor. At the present time, and just so long as the float-feed type of carbureter is used, the specific gravity of the fuel must be considered on the ground that the level of the float depends upon that very property of the fuel.

There are those who say it matters very little if the fuel stands high or low in the nozzle, since it will be sucked out anyway, and in a small degree they are justified in their belief, but it does matter if the fuel runs out of the nozzle and "floods" the carbureter. It counts primarily because it upsets the even tenor of the mixture, and it wastes fuel. The float can be set for any gravity of fuel, but it is not easy to change it from day to day, or even on rare occasions, to suit the vagaries of the fuel situation. The direct injection of fuel would obviate this trouble once for all, as the injector would be dependent upon the bulk and not upon the weight of the fuel.

It is not the intention here to elaborate upon the details of design of injectors, such as might serve the purpose of forcing liquid fuel into the combustion chamber of the motors. It will be enough to here disclose the fuel characteristics in so far as

they influence the situation in favor of the direct injection of the fuel, rather than its vaporization before use. In the first place, the fuel is not vaporized in the present types of carbureters. It is sucked out of the nozzle in a stream, and is carried along in the path of the air current, subdividing as it passes along and reaching the combustion chamber in small globules, with, perhaps, some vaporization of the more volatile products of the composition, while the less volatile portions hold to the globule formation with a good deal of tenacity.

Indeed, the suction process guarantees that the spraying phenomenon (so much desired) will not be realized, for that condition is peculiar in forcing a liquid not aspiring it. The extent to which the globules will hold to their form will depend upon the length of the intake, the pressure, temperature and time. The time is short in practice, the impelling force is barely adequate to set up the motion, and the temperature is low.

Liquid Fuel Acts as a Refrigerant.

All the conditions to be found are such as as to assure the practical absence of complete vaporization. In some designs this ideal is more nearly realized than in others. The temperature of the intake is low, for the reason that liquids in changing to the gaseous state act as refrigerants. Considering the three states of aggregation of all elements and compounds, *i.e.*, solid, liquid and gas, it must be considered that a heat exchange attends the transformation of such elements and compounds as can be changed from one to the other of the three states. Refrigerants, as the term is generally understood, are compounds, such as ammonia, carbonic acid, sulphur dioxide, etc., in which the heat exchange is attended by a considerable lowering of the sensible temperature as the liquid compound is evaporated into the gas formation. The temperature of ebullition in the case of refrigerants must at atmospheric pressure be the temperature of the surroundings, just as it is with the more volatile hydrocarbon products. Gasoline is not commercially valuable as a refrigerant for the reasons given, but it is a refrigerant nevertheless, as evidenced by the lowering of the temperature in the intake.

In mixing gasoline with air the process involves the evaporation of the gasoline; it must be deprived of its latent heat. This is not merely a matter of mingling the gasoline with the air, since the latent heat must be abstracted from the gasoline by the air before the liquid will change to the gaseous form. This takes time, of which but little is available in the interval between leaving the nozzle and entering the combustion chamber. The specific heat of air is low, and as a result the globule of gasoline must come in contact with many volumes of air before the specific capacity of the air will equal the latent heat value of the liquid gasoline. All these, and other conditions tend to thwart the good intentions of designers.

One other point to be emphasized is that gasoline as it is sucked out of the nozzle of the carbureter, made up, as it is, of hydrocarbons of differing values, from the point of view of weight and volatility, will hold to the globular form with greater or less tenacity, depending upon whether conditions are pronouncedly one way or the other. It should be noted that doubling the diameter of these globules increases their surface four times, but their bulk will be increased *eight times*. Evaporation is proportional to the surface, but if double the quantity resides under a given surface, double the time must be taken to gasify the liquid, subject to a correction in that the spheroids are reducing in diameter as the vapor expands.

Demonstrating the Action of the Nozzle.

There is no better way to find out the difference as between the nozzle performance under a vacuum and the performance of the same nozzle if pressure be applied than to watch the nozzle in a carbureter during the operation of a motor, and as against this put pressure on the same nozzle by any suitable means. With the vacuum it is a stream; with the pressure it is a spray—that is, provided the nozzle is suitably shaped. An ordinary gasoline torch has more carbureter philosophy in its humble makeup than can be found in most special devices costing overmuch and intended to prove out some theory.

With the torch it is easy enough to observe that liquid will survive the flame. All that is necessary to do to show this is to shoot the flame at some obstruction in juxtaposition. The liquid will be sprayed against the surface and the flame will not capture all of it.

The reason is, as before stated, that the latent heat of the fuel cannot be abstracted by air quickly enough to vaporize the liquid fuel, partially because the air is of low specific heat, and, again, because of the law of the sphere, in which, as before stated, eight times the volume can hide under four times the surface, if the globules be doubled in diameter.

Thus far the treatment of this subject has been, comparatively speaking, superficial, in that the future prospects are to be influenced by other and very material considerations. Hydrocarbon liquid fuels up to now have been comparatively low in cost and much more uniform in point of volatility than can be hoped for in the future. The specific gravity has been more uniform than it will be in the future. The divergence of the components in the fractional distilling process will be extended, in all probability. In other words, the limiting temperatures between which automobile gasoline will be tapped off will be wider; the product will include more of the components of the hydrocarbons. In the torch test more will shoot through the flame and land on the obstruction without taking fire at all.

This increase may be charged to a phenomenon in connection with hydrocarbon fuels that has ever been present, to at least some extent, at any rate. The time required for evaporation is not the same with all the compounds in the makeup of the fuel, and the inflammability is influenced differently with a given air dilution for the several compounds.

If, then, the several compounds are intermingled indiscriminately, it will be found that some of them will ignite readily, others with some difficulty, and more with considerably increased difficulty. The torch will show this, since the compounds that will not ignite readily will shoot through the flame and be impinged on the surface of the obstruction. Within the era of fairly uniform hydrocarbon fuels stratification was merely suspected. When the compounds entering the fuel are widely divergent there will be more than a suspicion of the presence of this undesirable phenomenon.

Essential Elements of Direct Injection.

In the chapter on "Available Fuel for Automobiles," to appear later, the time constants of the compounds in the hydrocarbons will be given a measure of attention. Here it will be enough to point out that the direct injection of fuel is not attended by the troubles so characteristic of the carbureter, for the reason that the fuel is positively pumped into the combustion chamber. There may be troubles of quite another sort to be expected, in view of the fact that nothing of moment will be entirely free from complication of some sort; there would be no place in the world for engineers without it.

In the direct injection of fuel it is apparently necessary to time the injection and carefully measure the weight of the fuel injected, in view of the quantity of air admitted. It must be borne in mind, as well, that the completeness of the combustion will be a measure of the relation of the injector (pump) to the air valve. The quick and complete combustion of the fuel cannot be effected with what may be termed "the right amount of air." There must be an excess, and unfortunately the magnitude of the excess is variable, depending upon the compounds in the fuel, their relative proportions, and the compression, assuming that the spark is properly timed. The time constant of the flame propagation is not the same for the several compounds entering into the hydrocarbon fuel. Were but one compound used, the time would only change with the *richness* of the fuel and the degree of compression, assuming a corresponding temperature due to compression.

The structural problems then will be difficult of solution if the results are to be better than those realized in the cases in-

volving correctly designed float-feed types of carbureters. It will be extremely difficult to fix the relation of the injector to the air valve; regulation for load changes will be equally a problem, and harmonizing for speed changes will be something to ponder over as well. That the direct injection of fuel will prove to be impossible is a matter that will not need second thought, for the simple reason that it is an accomplished fact, and has been for several years. None of the fuel problems can now be regarded in other than the light of refinements.

Why "Explosive Mixture" Is a Misnomer.

The great question of the future is one of high weight efficiency of the motor and high fuel efficiency, to be realized by properly supplying the fuel in conjunction with an adequate supply of atmospheric air (diluted oxygen). Indeed, it will probably never be possible to consider the use of pure oxygen in this work. Pure oxygen costs over much, and to add it directly to the fuel would be attended with danger, since the mixture then partakes of the characteristics of what may be properly termed an explosive. It is not uncommon to hear the mixture used in the internal combustion motor called an explosive mixture, but it is not properly such. Explosives are possessed of the elements necessary to their complete combustion in the absence of any outside supply of oxygen, and the rate of flame propagation is high in comparison with motor fuels. The piston of a motor cannot travel fast enough to get out of the way of an explosive mixture. This the author found out in a manner that might be termed emphatic, when some years ago it became fashionable to use B. B. DuPont powder in a cartridge inserted in a breech-lock mechanism fixed to the combustion chamber for starting, to obviate cranking, especially the larger sizes so difficult to get in motion when cold.

The scheme worked very well except in the hands of men who did not care to go through the operation twice, which became necessary on very cold mornings when the crankcase oil was of the consistency of molasses. On such occasions it was not uncommon to catch such men in the act of throwing a handful of powder into the chamber before inserting the cartridge. The plan was abandoned after a few disruptions, and especially upon being able to procure an indicator that would give a card of the curve of pressure that the blasting powder developed. Apropos of oxygen, some fuel mixtures have this element in their composition, and, in consequence, are somewhat more lively in their flame-propagating characteristics.

Fuel is relatively quick burning, but it is not an explosive in the sense that gunpowder is. Unfortunately, the fuels we are able to procure are mere mechanical mixtures of several distinct compounds of carbon and hydrogen (in the main), and each compound has its own time constant.

Bearing in mind the fact that the injector, to be as nearly perfect as possible, will have to be so designed as to supply fuel at the right time and in the right proportion, it will be necessary to discuss one more phase of the subject, a phase, in fact, beyond the pale of carbureters of the float-feed or any other known type, as they exist at the present time.

Fuels in the three states of aggregation will range as follows: (*a*) In the gaseous state they occupy the maximum space for a given mass; (*b*) in the liquid state the bulk is a minimum, differing but slightly in this respect from fuel in the solid state; (*c*) fuel in the solid state is nearly of the same bulk per pound as the liquid fuel, but the solid fuel is in more acceptable form in some respects, in that it will not evaporate, nor will it form an explosive until melted and combined with air (oxygen).

Solid fuel would be very troublesome in connection with the present types of carbureters, and it is the positive pump (injector) that would seem to lend itself to the purpose, if we are to consider solid fuel.

The latter is probably best represented by naphthalene, which is one of the aromatic hydrocarbons, and is an extract from coal tar. In naphthalene we have the nearest approach to the direct utilization of coal in the internal combustion motor. The cost of production should be very low.

It would seem to be unnecessary to point out that all the other products of the process involving the production of naphthalene from coal have a stable market, and there would be no over-production of the one or the other were naphthalene used in vast quantities in automobile motors. It is not too much to say that this fuel would quickly take the place of gasoline, at a third or less cost, were its satisfactory utilization a settled matter. The direct injection process is what holds forth the most promise in this connection, since to melt the solid fuel would be easy enough were it not for the fact that present types of carbureters demand a constant viscosity of the liquid, which could not be assured in the use of solid fuel, since maintaining a constant temperature would be very difficult.

Considering the direct injection of the fuel, it would not matter so much if the fuel were very hot or quite viscous (within limits), since the positive injection of fixed quantities would satisfy the demands; at all events, more nearly than the carbureter handles the liquid fuel of the present time. Naphthalene is especially suited to the positive injection process because of its characteristics, as high-vapor tension is pronounced. If a "fog" (very fine spray) is the ideal form of the fuel as it enters the combustion chamber, high vapor tension is the phenomenon that will assure the result.

The mixture of air with this hydrocarbon is readily ignited, according to the reports of those who have used the fuel, and the residue is not troublesome, as might be supposed in view of the high carbon content.

"Sooting" is not a feature, as it seems; nor do the polished surfaces of the cylinders show any deterioration as the result of the use of this fuel. In conclusion, then, it is plain to be seen that the direct injection of fuel offers possibilities, not only by way of a remedy for present defects, but by way of the use of a far cheaper fuel possible of supply in unlimited quantities.

SOCIETY OF AUTOMOBILE ENGINEERS TO MEET AT CLEVELAND

CLEVELAND has been set as the place for the third quarterly meeting of the Society of Automobile Engineers this year, and the dates will be Friday and Saturday, September 18 and 19. The Hollenden House will be headquarters, and the program as already outlined, will devote considerable time to visiting the numerous important automobile manufacturing plants located in Cleveland. The entire morning of the first day will be given over to this, followed by a lunch to be arranged for by the local committee, consisting of James G. Sterling, chief engineer of the F. B. Stearns Company, chairman; H. B. Anderson, of the Winton Company; F. B. Stearns, and H. W. Alden, of the Timken Roller Bearing Company, Canton, O.

The afternoon will be devoted to the business meeting and the reading of papers, discussion, and the like, and there will be a dinner in the evening, to be followed by a continuation of the technical session. On the second day a train will be taken to Akron for a visit to the Goodrich and Diamond tire plants in that city, and the visiting members will be the guests of the Diamond Rubber Company at a lunch to be given at the Akron Country Club. Following this, the trip will be made to Canton, where the society will visit the plant of the Timken Roller Bearing Axle Company's plant, and the members will be the guests of the latter company until their departure from Canton in the evening, the meeting formally ending in that city with the visit to the Timken plant.

USEFUL POINTERS FOR MAN WHO DRIVES

A CONE clutch whose leather has become glazed from use can be relcathered with a piece of belting of suitable thickness and cut to shape. The first thing to do is to measure the thickness of the old leather to the nearest thirty-second of an inch, taking the leather off for this purpose. The new leather is not likely to be required more than 1-32 of an inch thicker than the old leather, since the wear is very slight. Straighten out the old leather on a sheet of paper and measure to see what width the belt will furnish a piece of approximately the same curvature. Since the leather will stretch slightly it is not essential that the pattern of the old piece should be followed absolutely. On the other hand, if the new piece is too straight it will bulge on its smallest diameter between the rivets and will not fully release when the pedal is depressed. The new piece of belting should be carefully selected for uniform thickness throughout. The new leather is cut from it about 1-4 inch short, and is punched and countersunk at the ends for the rivets. It is then soaked in water for 3 or 4 hours, causing it to swell and soften. Meanwhile a cup-pointed rivet punch is procured, also a short square-ended rod small enough to bear against the rivet heads when they are countersunk in the leather. When the leather has finished soaking it must be applied to the clutch before it has time to dry, else its shrinkage renders it unmanageable. First one end is riveted in place, using two rivets, and the other end is brought around and temporarily held in position by rivets or wire nails. Then the opposite portion of the strip—half way between the ends—is stretched into place and marked and punched for the middle rivet. A wire nail is stuck through to hold it, and the remaining rivet holes are located and punched in the same manner. When all have been punched they are countersunk, using preferably a flat-pointed countersink made for the purpose, though a sharp pocket knife will answer. The rivet heads should be at least 1-32 inch below the surface of the leather. The leather is now riveted fast, following the same order of procedure as in locating the holes. In case the work takes longer than 1-2 hour it will be well to keep the leather wet, particularly if difficulty is experienced in stretching it sufficiently. On drying the leather will grip the clutch cone very tight. When dry it should be given a thorough soaking with neatsfoot oil, and the oil treatment should be repeated whenever the clutch gives signs of gripping too harshly.

Strange Noise and Its Cause.

A curious incident which lately befell the owner of a small four-cylinder touring car may be of interest to others. He had bought his car—a high-grade one—at second-hand after three years of service, and had personally overhauled it and put it in satisfactory condition. The engine had been found to be in good order, but as a precaution the gears, which were separately enclosed in an aluminum housing at the front of the engine, were exposed and examined. The engine was oiled by splash with two feeds to the crankcase and one to the governor case—enclosing the gears—from a combination mechanical and sight-feed oiler. The oiler frequently failed to pump, and the crankcase was then fed by a hand pump, and melted grease and oil were injected occasionally into the governor case by disconnecting the oil pipe. One day while the owner was visiting friends some miles from his home an ominous noise developed about the engine. It came and went in pulsations, which became more prononnced when the throttle was opened; and it was neither a grind nor a scrape, though it strongly suggested both. It seemed to come from the front part of the engine, and the fan and fan shaft ball bearings were investigated without result. The power did not seem to be affected, and the only conjecture the owner could make was that one of the gears he had recently examined had slipped endwise on its shaft and was grinding away at the aluminum casing. There was no immediate opportunity to examine the gears, and a 40-mile spin was taken with the friends aforesaid. Before the 40 miles were over the noise had become almost continuous and was alarmingly increased in volume; and the owner drew a long breath of relief when the ride had ended without sudden casualty. On depositing his friends he took the car at once to a garage, and, aided by a helper, dismounted the headlights, front mud guards, radiator and radiator cradle in order to gain access to the plate covering the gears. To remove the cradle from the frame it was necessary to slacken the two lateral bolts holding the front side arms of the crankcase to the side members of the frame. This permitted the frame members to be sprung apart sufficiently to release the cradle. At this point it was discovered that the left hand front engine-to-frame bolt was already loose. The space inside the channel was filled by an aluminum casting which met the crankcase arm. The reaction from the explosions produced a lifting action at this point which overcame the weight of the engine, and the aluminum casting was itself free to shake. It was instantly suspected that here was the cause for the noise. Nevertheless, the gears were exposed and examined to make assurance doubly sure, and, as anticipated, they were found in perfect condition. On reassembling the parts with the bolts properly tightened, the noise was banished. If the true origin of it had been suspected at the outset it could have been corrected in three minutes. It must not be inferred from this that a loose engine-to-frame bolt will always result in such disquieting symptoms as those just described. If the aluminum casting had been a snug fit in the frame most of the noise would have been prevented, and the bolt might have broken off before the much less audible thumping of the crankcase arm on the frame had been traced to its real cause. Cases have been reported of small two-cylinder engines, suspended crosswise at the front of the car, shearing their frame bolts nearly through or breaking them off entirely before the owner suspected anything wrong.

Care of Sprocket Chains.

It is rather common, especially in cars with planetary gear chain transmission, to see the sprocket chains drenched with oil and thickly covered with dirt. The oil itself is naturally not objectionable, but the dirt draws the oil as fast as it gathers, and, since the oil causes it to cling, it abrades the teeth of the sprocket wheels. It must be admitted that the proper treatment of sprocket chains is less easy than slushing them with oil. As outlined by the chain makers and motor car manufacturers, it is to detach the chain, say once in 500 miles—oftener would be better—soak it for several hours in kerosene and wipe as clean as possible; then boil it in mutton tallow to which a liberal supply of graphite has been added. When the chain is taken out after the tallow has had ample time to enter every crevice, it is wiped as clean as possible, so that it will not catch the dust more than can be helped. It is then brushed clean at the end of every day's run. The brushing process calls for a jack, but if the right kind of a brush is used it need not take more than a few moments. A convenient brush may be made by wiring three bicycle chain brushes side by side.

A Case of Overheating.

A 30-horsepower four-cylinder touring car once developed a stubborn case of overheating which puzzled the owner for several weeks. The pump was inspected and found in good order; the carbureter was readjusted and the fan belt tightened, but still the overheating persisted. Finally the cause was discovered in the gaskets between the water pipes and the cylinder castings, which had melted and spread until they nearly closed up the openings. A few minutes' work with a sharp knife settled the trouble for once and all.

LETTERS INTERESTING AND INSTRUCTIVE

IS THE PRIVATE PIT ADVISABLE?

Editor THE AUTOMOBILE:

[1,525.]—Being possessed of mors than the average run of mechanical sbility, and contemplating the erection of a private garags where I can house and take care of my own car, I would like to know if you consider a pit an essential part of such a building. My mechanical knowledge has been gained in lines other than that of automobils repairing, and while in the early days the sight of a driver lying underneath hie car was quite a frequent one, I must say it is something that I have not noticed now for a long while. I do not know whether this is altogether on account of the automobiles having been improved to such an extent that similar attention is no longer necessary, or whether the development has only progressed to a point where this can be given in a garage, and this is the reason why it is no longer done on the street. In your opinion, would a pit justify the expense entailed in making it.

Mt. Vernon, N. Y. ENGINEER.

We should say that the construction of a pit merely to take care of such repairs of this kind as would be necessary on a single car, would be a needless expense. Even where it is the owner's intention to effect repairs of every kind within his ability to handle with the facilities available in a small private repair shop, the construction of a substitute for a pit is so easy and so much more economical as to place the latter out of the question. The frequent necessity for lying down in the mud beneath the car in former days was largely due to the fact that American designers favored the horizontal type of motor and many of its essentials could not be conveniently reached in any other way, though probably it is somewhat of a misnomer to use the word convenient where crawling beneath a car is concerned. The placing of the motor forward, and the tendency toward a unit type of design in which the gear-set is either a part of the motor unit, or is combined with the rear axle has made the occasions on which it is necessary to get beneath the car so rare, that nowadays neither a pit nor a substitute is considered essential. In case of a repair to the propeller shaft, it would be easier to remove the body of the car.

INFORMATION WANTED ABOUT BELT DRIVES.

Editor THE AUTOMOBILE:

[1,526.]—Can you tell if bslts have ever been employed on automobiles for the transmission of the power, and if not, why such a method is not perfsctly feasible. Belting is employed for driving machinery under the most esvere conditions, out of doors as well as under cover, and as the belting on an auto could easily be protected, as is most of the machinery now, there seems to be no reason why it should not be a practical solution of the problem of transmission. INVENTOR.

Philadelphia, Pa.

Belts have been used on the automobile, and usually to the sorrow of its driver. The German Benz cars back in the Nineties, had a belt transmission, and not a few others have followed the example of these pioneers, only to give up the use of anything so frail and uncertain as leather and canvas for the transmission of the power under conditions which cannot be approached by any other form of service for severity. True, motorcycles still employ belts to transmit the power in a number of different types, but, in our opinion, this is the weakest part of machines of that class, and they would be far better off with a chain. In fact, the tendency throughout engineering practice is to do away with the belt altogether wherever it can be dispensed with, and machines that cannot conveniently be directly connected to the source of power, are now very largely chain-driven. The latter is positive and at the same time permits of a certain amount of flexibility through the looseness of the chain. There is no good reason why a transmission using chains altogether to give the different speeds would not be feasible, particularly where a chain of the "silent" type, such as the Renold, is employed, but in the light of present design, it would be far from being a practical and commercial success, as the tendency is almost entirely to the shaft-driven type of car.

A BRIEF FOR THE THREE-CYLINDER.

Editor THE AUTOMOBILE:

[1,527.]—Your answer to Mr. Ellis, on page 229, issue of "The Automobile" of August 13, does not seem to me to accord with the facts. The customary three-cylinder engine has its cranks at 120 degrees apart, and this is an even spacing, and therefore just as well balanced as can be. It can be shown both by trial and mathematically that when there are two pistons moving in one direction they are moving slower than the third and so are balanced by it. The power impulses follow each other in regular sequence and are thus balanced. The only thing not balanced worthy of mention is the movement of the whole engine in its plane due to the flywheel being by one end only. This is somewhat more perceptible than with a two-cylinder and cannot be partly overcome by having two pistons at the ends move together as it is partly overcome in a four-cylinder.

With pistons of decent weight, this movement is negligible and even in a light vehicle, the three-cylinder engine can serve so well that it is impossible to tell whether it is a three or four-cylinder by the feel of the riding. And this is the final test. Of course, if a buyer wants the biggest thing on the street, he is not satisfied with three cylinders, but must have six or eight; not that these numbers are appreciably better than five or seven, but that he may have more than common. And why he should stop at eight I do not see. If there is virtue in quantity, why not go to the limit? Ten will run more smoothly than six and no flywheel is needed. And think of the long bonnet needed to cover ten cylinders. It could be used for a bedroom in a pinch.

But if a man wants the golden mean that gives the maximum advantage with the minimum complication and cost, it seems to me he must stay nearer to a sane number of cylinders. The success which the one-lungers have given is too well-known to be lost sight of. But the single cylinder does not balance, and this is its objectionable feature. We must have at least two. If four cycle, they must be opposed to both balance the pistons and impulses and the opposed engine has some objections, so the next number is the three-cylinder. This is the least number that balances the parts and explosions and it has all the advantages of compactness and suitability that the four-cylinder has. It is slightly less steady but it has one set of parts less. The reduction in number of parts is far greater than the loss in steadiness of running.

This will readily be understood by comparing a few engines. The single-cylinder of a given power gets but one impulse in two revolutions. It is the maximum of simplicity and vibration. Two cylinders for the same power balance each other, thus wiping out that source of vibration and dividing the impulses by two, both as to size and time, so that the vibration therefrom is but one-fourth as great as with the single-cylinder. Thus doubling the parts decreases the vibration by more than 75 per cent. This is a gain worth while. When we add another cylinder we get balanced parts as before, so there is no gain there, but we get three impulses of 1-3 the power in a given time and so each is but about 1-9 the original effect.

This is more than cutting them in two and with the other advantages of the multiple cylinder form, such as simple piping, juxtaposition of plugs, single camshaft and similar reasons, is sufficient to pay for increasing the number of cylinders to three. But the four-cylinder engine gains nothing except a slightly better balance. The difference between 1-9 of a given shock and 1-16 is so slight that the average rider cannot tell it with certainty and so it is negligible; but the difference betwsen keeping three and four cylinders in order, oil and spark is 1-3 and the cost is more than the gain. This is why I believe in three cylinders for four-cycle engines and two cylinders for two cycles. These numbers are the least that will give the multiple cylinder effects. I have never seen a three-cylinder motor with 180-degree shaft except in compound form. Six-cylinder engines are simply two threes, so there is nothing wrong with 120-degree shafts. CHARLES E. DURYEA.

Reading, Pa.

We cannot say that we have ever seen a three-cylinder, four-cycle engine that had its crank pins placed, two in one plane and the third 180 degrees away, but our statement in the reply to the letter in question, was to the effect that regardless of whether the cranks were spaced equally round the circle as in the 120-degree arrangement, or as just mentioned, the impulse balance was far from being as good as could be obtained with the four-cylinder engine. This, we think, is in accord with the facts, and are further of the opinion that it is borne out by your own letter, in which you state that the difference between 1-9 and 1-16 is negligible, the latter representing the decrease in

vibration brought about by the addition of an extra cylinder. In view of the high compression and high speed now currently employed in automobile motors, it strikes us that this matter of more than 40 per cent. difference is quite the reverse of negligible. In fact, to regard it as such is almost on a par with an alleged automobile designer who is said to have marked the representation of a hole on a drawing "nearly 3-8 inch." Trying to make a good fit of a 7-16-inch bolt in that hole would appear to be about equivalent to stating that a difference of 40 per cent. or more in the vibration was a negligible quantity. Of course, the actual quantity itself is small, and stating it in percentages is frequently misleading. Further than that, the fact that a jury has convicted a man of a crime does not mean that he may have been actually guilty of it; merely that they think him so. Thus the great number of users of four-cylinder motors may not actually mean that it is so far superior to the three-cylinder that the latter has been forgotten completely, but merely that they think it is. But the thinking so seems to be equally effective in both cases.

WHAT ARE THE DRAWBACKS OF CONE CLUTCHES?

Editor THE AUTOMOBILE:

[1,528.]—I have noticed that during the past three or four years there has been a constant tendency away from the old conical type of clutch with its leather facing, and in favor of the multiple-disc type. However, this seems to have been largely the case, at any rate as far as my observation extends, with new makers in the field, and with old-established makers where they brought out new models. Despite this general tendency, for it certainly does seem to be very general, some of the most prominent makers still stick to the cone clutch, so it seems to me that there must be something more than the reasons which appear on the surface for its retention in one case, and its abandonment in favor of the multiple-disc type in the other, particularly as the later type of clutch is much more expensive to build, although the later fact does not appear to prevent its adoption on low-priced cars.

By way of enlightenment, both for myself and doubtless a great many others who are equally interested, will you briefly sum up the good and bad points of the leather-faced cone clutch? I have driven a car equipped in this manner for three years now and I have had very little occasion to find any fault with it, nor have I had to go through the long list of ills that so many of your correspondents detail concerning their experience with their cone clutches.

FRICTION.

Toronto, Ont.

As was the case with practically every other essential of the automobile of early days, many mistakes were made in the design of the first cone clutches, so that their refusal to work satisfactorily was not the result of there being an inherent defect in the principle, but lay almost entirely in their design. We say "almost entirely," because a development that has since come into existence has had a great deal to do with the improvement of the cone clutch since, and that is the cork insert. Many of these early clutches were designed with an improper angle of contact, then again, the spring pressure was insufficient, or in the case of a clutch of large diameter, improperly applied, though the most prolific source of trouble was the manner in which the clutch was mounted on the car.

Frequently, the side members of the frame were depended upon to some extent to preserve the alignment of the motor, clutch and gear-set, and where insufficient means were employed to permit the clutch to center itself in the flywheel automatically, regardless of its relation to the gear-set, it was not to be wondered at that trouble followed after the car had been in use a comparatively short time, as the frame either received a whack that put it out of true, or it sagged sufficient to give rise to ills that were nearly always traced to something else. Needless to add, the correction of the latter did not in turn correct the ill.

Given the correct angle of contact, a proper mounting that will permit the clutch to center itself in the female member regardless of its relation to the other essentials of the transmission, the leather-faced cone clutch will be found very satisfactory, and it can readily be made of such small diameter and of such weight that its inertia will not interfere with gear-changing. Another source of trouble on early cars, was the leakage of leakage of lubricating oil out of the crankcase, and this found its way along the crankshaft and onto the facing of the clutch where it naturally destroyed the friction properties of the leather against the cast-iron and caused such an amount of slipping that the clutch often became virtually useless from this cause. This gave rise to the use of numerous applications, such as rosin, talc, fuller's earth and the like, which, of course, were nothing more than makeshifts. Better design has served to eliminate this source of trouble to a very large extent, while the adoption of cork inserts, the coefficient of friction of which is not influenced by oil, did away with it entirely, beside effecting a vast improvement in the conical type of clutch as a whole. This, together with the fact that their clutches were probably better designed in the first place than many of the others, accounts for the retention of the conical type by some of the best known American makers.

But there has been another factor at work, where the adoption of the multiple disc type of clutch is concerned, and that is that it can be said to merit the term of "fool-proofness" to a much greater extent than any other, and, moreover, it does not require anything like as much skill to handle it properly as does the cone clutch. In other words, it takes a better driver to handle a car with a cone clutch than one with a multiple disc, especially at the outset, before the peculiarities of the car are known by the driver. The ability to run a multiple disc cutch constantly in oil is another factor of great importance in its favor, and as the discs may be made of small diameter and very light, the inertia effects are reduced to a minimum.

WHAT IS THE CAUSE OF THIS DRIPPING?

Editor THE AUTOMOBILE:

[1,529.]—I have a Rapid car and have been having considerable trouble with my carbureter, which will drip constantly after the engine is stopped. I have lowered the float and finally bought another carbureter of the same make, but with the same results. The system is of the float-feed type. If any of your readers can help me out, I will appreciate it very much, as the dripping is not alone wasteful, but is also dangerous. WALTER WALDIN.

Miami, Fla.

As you do not say just where the gasoline drips from, nor how long it continues after the engine has stopped, any diagnosis that we can make of the trouble can be nothing more definite than a conjecture. It may be due to capillary action, the level of the gasoline in the float chamber being so close to the opening of the nozzle that this goes on steadily, or it may be due to a poor adjustment of the carbureter, the engine getting a mixture more or less rich in liquid gasoline, which, while the motor is running, is consumed, but once it is stopped the amount that has collected in the manifold begins to collect and drip out. Lowering the float should prevent the former, while a correct adjustment of the needle valve to suit the demands of the motor for fuel should avoid the latter cause. It is quite probable that the trouble is due to neither of these, and if any of our readers have had a similar experience which puzzled them to the extent of investing in a second carburcter, they are quite welcome to explain the cause and the remedy they adopted, in these columns.

CONCERNING THE MILE CIRCULAR TRACK RECORD.

Editor THE AUTOMOBILE:

[1,530.]—I have seen lately in two different newspapers where Barney Oldfield made a mile in :29 on a circular track. This was made on a southern track, at Louisville, Kentucky, I believe. Traveling a mile in twenty-nine seconds is going faster than 120 miles per hour; this would be remarkable on a straightaway, but, as it said, this was on a circular track. This seems incredible to me, but to settle an argument I write you. What is Oldfield's fastest mile on a circular track? FRED E. PETTIT, JR.

Peabody, Kansas.

This was evidently a misprint and intended for :59. Oldfield's best time for one mile on a circular track is :53 flat, and in view of the poor nature of the ground on most of the horse tracks, it is probably pretty hard to better this. It is not, however, the mile record, which was made by Christie in one of his front driven machines at St. Paul last year. This is 52 seconds.

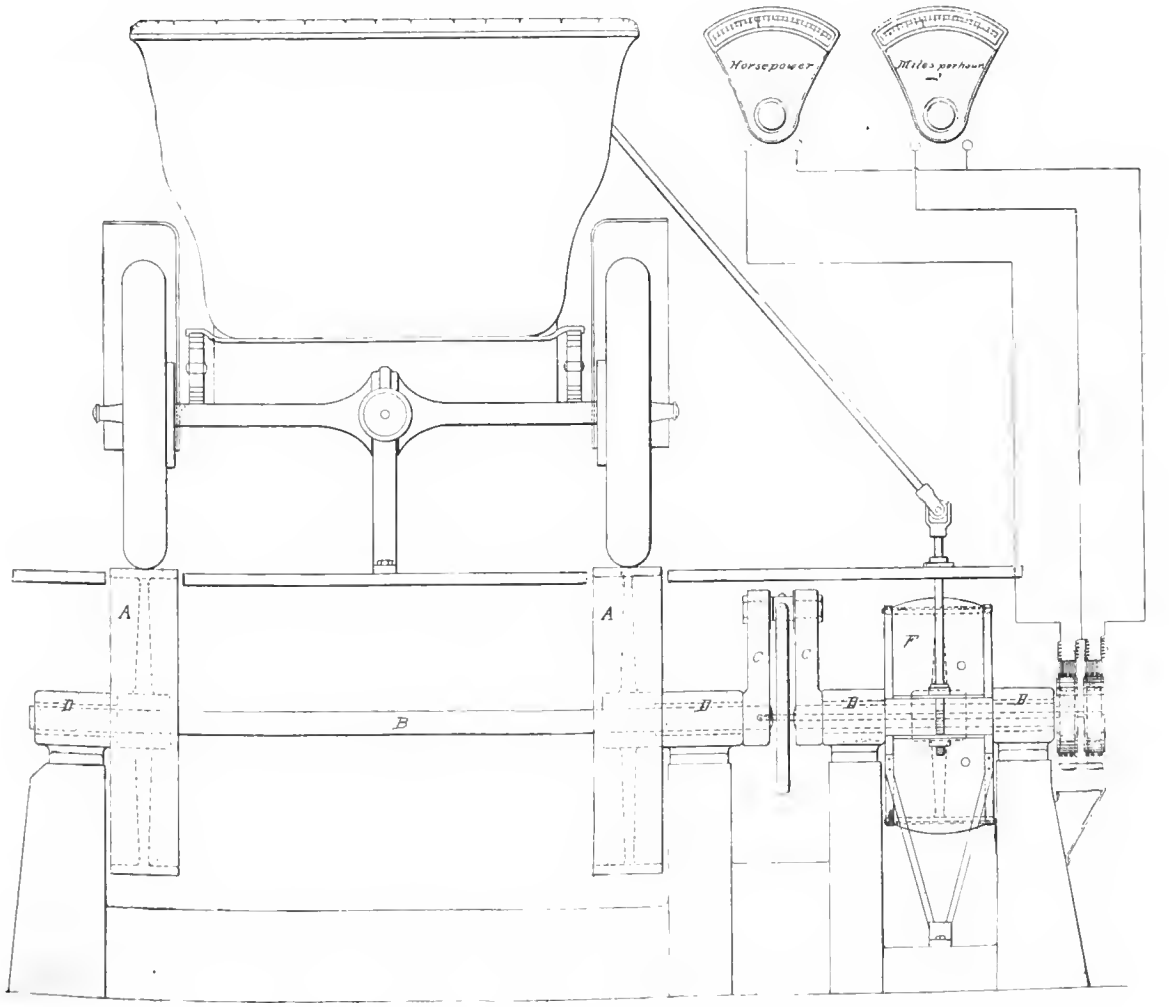
A DIRECT READING AUTOMOBILE POWER METER

By PROF. J. W. ESTERLINE, Purdue University.

PROF. C. R. MOORE of Purdue University and J. Harris, of the Central Laboratory Supply Company, of Lafayette, Ind., have developed and patented a power and speed indicator, especially adapted for use in testing automobiles, which is unique in the fact that it indicates directly on a scale, without any calculations whatever, the horsepower developed at any speed and the speed in miles per hour. This instrument should be useful to manufacturers as a convenient method of testing the driving power of a finished machine, the test being easily and quickly made, without any changes being necessary in the automobile to prepare it. Such a method should be especially desirable in winter and when the roads are bad, and it has the further advantage that all parts of the machine are easily inspected during the test, as the automobile remains stationary. Salesrooms and garages will find it of value in demonstrating the power and speed of machines, as well as to test those which have undergone repairs. Members of automobile clubs will take interest in comparing machines, and in making power and speed tests for themselves.

The rear wheels of the automobile to be tested are run upon two wheels (*A* -*A* in the drawing) spaced to correspond to the tread, and mounted on a shaft *B* beneath the floor. The front wheels are blocked, and the machine securely locked to a post in the rear. When the automobile is started, it itself cannot move, but it drives the two wheels *A*. To place a load on the engine an absorption brake *F* is connected to the end of the shaft. The power required to drive the brake is changed or adjusted by means of a hand wheel within reach of the operator.

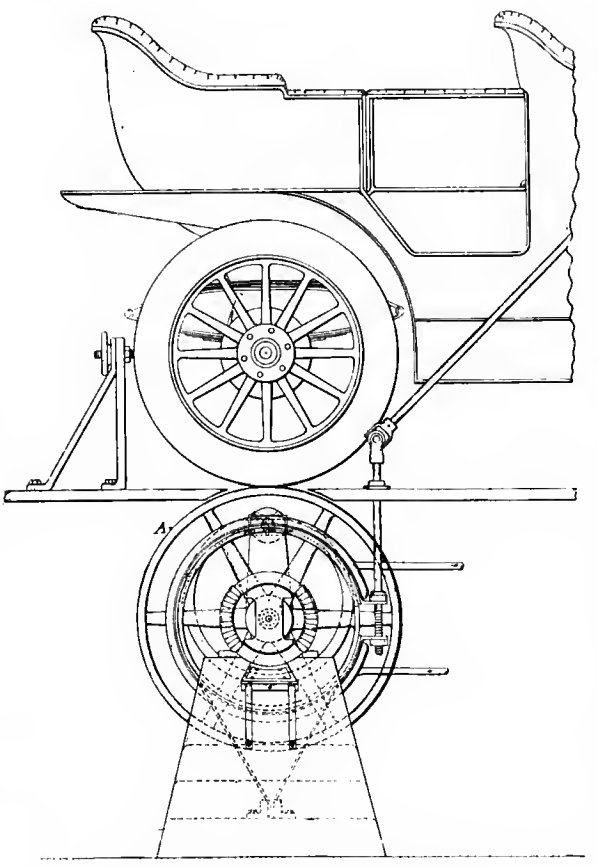
The ingenious part of the apparatus is the device which indicates the power. It is comparatively easy to make a power indicator which will show the power correctly at one speed, but to produce an instrument which will indicate the power delivered by the engine at any speed, is not so simple a matter. The power meter *E* is connected between the shaft *B* and the spindle of the brake. It consists of two discs *C*, one fastened to the shaft *B*, the other to the shaft of the brake, and connected by a spring. All of the power developed by the automobile is transmitted to the wheels *A* and the shaft *B*, then through this spring to the brake. The spring is designed so that twice the sine of half the angle of deflection is proportional to the torque de-



Sectional View Showing Elevation of the Moore-Harris Direct Reading Electrical Power Meter.

flecting it. When the brake is applied the spring is deflected by the power transmitted through it.

Connecting to each of the discs *C* is a small revolving field alternating current generator. The generators are exactly similar, and produce sine waves of voltage at the same potential. It is well known that when two alternating currents of the same voltage and wave form are directly opposed to each other no current will flow, but if the alternating waves are displaced, then a current will flow proportional to twice the sine of one-half the angle of displacement. The two generators are connected in opposition and so placed that they exactly oppose each other when there is no deflection of the spring between the discs *C*. A voltmeter is placed in the circuit between the two small generators. When no power is transmitted there is no deflection of



Side Elevation of Moore-Harris Power Meter.

the spring and no current flows, consequently the voltmeter reads zero. When power is transmitted by the spring it is deflected, and the two alternators are thrown out of step by an amount equal to the deflection of the spring. The torque is proportional to twice the sine of one-half the angle of deflection of the spring. Also the current through the voltmeter is proportional to twice the sine of half the angle of displacement of the two alternating currents, which is also the deflection of the spring, so that the current through the voltmeter at a given speed is directly proportional to the torque.

The horsepower transmitted is proportional to the torque multiplied by the speed. Likewise the voltage of the little generators also changes with the speed as well as with the deflection of the spring, so that increasing either the speed or the torque will increase the reading correspondingly. Therefore, the voltmeter gives a reading proportional to the product of the speed and the torque, *i.e.*, it reads the horsepower transmitted. The voltmeter, of course, is calibrated in terms of horsepower inst of volts. This is the only instrument of the kind which been devised to read horsepower directly on a scale without mathematical calculations whatever.

Further than this, since the voltage of either of the alternat alone is proportional to the speed, by connecting one of tl directly to a second voltmeter, the revolutions per minute miles per hour can be read off the scale.

The shaft, wheels, brake, etc., are all placed beneath the fl so as to be out of the way. The instruments for reading ho power and speed can be placed on a table or mounted on wall. The use of revolving field alternators for indicating displacement of the spring does away entirely with conta brushes and moving electrical connections, which makes the paratus reliable and unlikely to get out of order. The ma facturers, the Central Laboratory Supply Company, of Lafay Ind., also furnish recording voltmeters, which may be used inst of or in connection with indicating instruments, so that a comp record of the test is made. The range of the power meter ca quickly changed by removing the spring and inserting anothe greater or less strength. The brake is supplied with an att ment so that if need be the spring can be quickly calibrated. of the springs sent out with the instrument are standardi so that this is seldom necessary.

The use of the power meter is not limited to automobile t ing, as it is being applied to the testing of gas and gasc engines, steam engines, machine tools, dynamos and mot However, its application to the urgent needs of the automc field is timely, and it will doubtless prove to be a useful adj to the manufacturing plant and the salesroom.

THE INTERNATIONAL ROAD CONGRESS.

The program of the International Road Congress w will be held in Paris during the coming October, has just l sent out. The Congress will open with a reception on the 1 on the 12th there will be a full meeting at the Sorbonne, lowed by the opening of the exhibition in the Tuileries Gard the various sections will meet on the morning of the 13th in the afternoon the delegates will visit places of interest Paris. For the rest of the meeting the program reads: O ber 14, excursion to Versailles; October 15, meetings of secti October 16, excursion to Fontainebleau; October 17, clo meeting; October 18 to 20, excursion to Nice and vicir October 21, visit to Monte Carlo.

The Congress will be divided into eight sections and altoge ninety-nine papers will be read, France contributing thirty-se Great Britain seventeen, Belgium fifteen, Germany twelve, United States eight, Holland three, Austria and Switzerland two, and Italy, Portugal and Russia each one. The subj which will be considered include the materials used in road struction, means of preventing wear and dust, effects of a mobile traffic, watering and oiling and signs indicating dista and dangerous turns and grades. Not only the wear and caused by automobiles on the roads but also the effects various kinds of roads on automobiles and tires will be cussed, the Hon. C. S. Rolls being down on the program a paper on the latter subject. Another paper will be read Dr. H. S. Hele-Shaw, the inventor of the multiple-disc clu The American delegates will go under special instructions f President Roosevelt, whom they visited recently at Oyster The President expressed the liveliest interest in the work the Congress, and hoped that it would be made permanent.

Emperor William has once again expressed his desire see the proposed Taunus track take on more tangible form has pointed out the gratifying financial results achieved at Die as a spur to the parties lagging with their decision. It is na ally only a question of money, and the city of Frankfort ca quite see its way to take up the heavy obligations connected the scheme.

LOZIERS for 1909 In Two Models

Lozier Four-cylinder, Seven-passenger Touring Model for 1909.

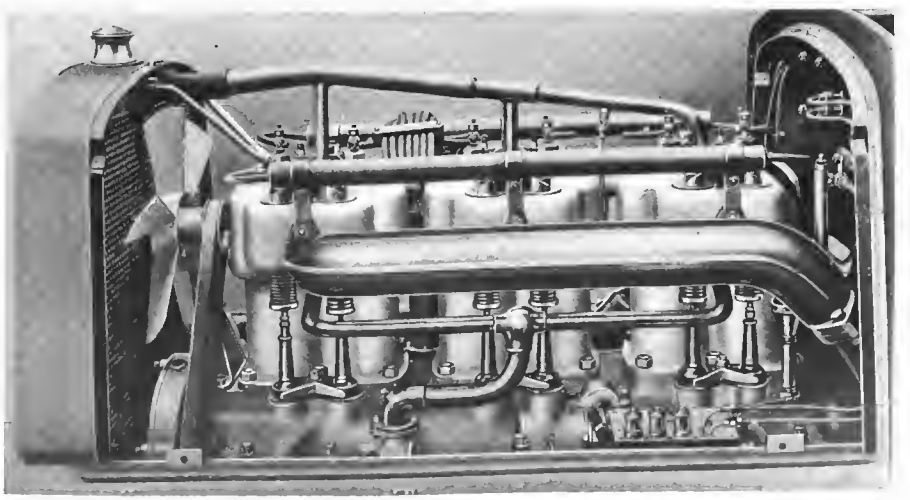
WITH the passing of the season of 1908 the double side-chain drive ceased to be a factor in the Lozier construction, as the announcement of the Lozier Motor Company, Plattsburg, N. Y., for 1909 is to the effect that there will be but two Lozier models for the coming season, and both of them will be shaft-driven. As a matter of fact, both of these models have been on sale since July 1, and a number of them are already in the hands of new owners. Both are standard chassis, on which runabout, touring, limousine, or landaulet bodies will be mounted, the difference being that one is a four-cylinder model and the other a six, the motor of the latter being shown by one of the accompanying illustrations. The cylinders of both models are cast in pairs and finished in the manner that has long characterized the Lozier motor, *i.e.*, a pearl-gray baked enamel. Large covers are employed instead of making the water jackets almost entirely closed, thus affording easy access.

The engine base is of aluminum alloy, and is cast integral, with supporting arms and bed-plate extending to the side members of the frame, which are considerably narrowed, thus giving an unusually short turning radius for a large car. A cast-aluminum oil-pan completes the crankcase, and may readily be dropped to permit of inspecting the crankshaft or its bearing, the matter of doing this being strikingly illustrated by one of the photographs. The cylinder dimensions of the four-cylinder motor are 5 1-4 inches "square," while the six-cylinder dimensions are 4 5-8 by 5 1-2 inches, the motors being rated at 45 and 50 horsepower, respectively, according to the A. L. A. M. formula.

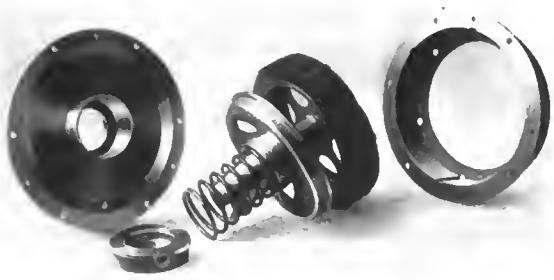
Valve disposition is of the outboard port type, two camshafts placed on opposite sides of the motor and inside of the crank case being employed. These shafts are made of one piece, with the cams integral, and are of special steel, which is subjected to a heat-treating process and ground on the cam faces to .001-inch. The valves themselves are of nickel alloy and are operated on the direct thrust plan, the valve springs being seated at their lower ends in cup lifters, thus insuring uniform downward push in seating the valve. The valve-lifter housings are fastened to the aluminum motor sub-base by means of yokes.

One of the most striking features of the 1909 Lozier cars is to be found in their crankshafts. These are forged from a chrome-nickel steel of the grade employed for armor-piercing projectiles, and each shaft is heat-treated, hardened and ground. In the case of the four-cylinder motor it is supported on four annular ball-bearings with very large balls, running between extra wide, hardened straps. The remarkably high elastic limit of this crankshaft will be understood when it is claimed that when supported at the ends it will stand a dead load of 17 1-2 tons without permanent deflection, and it is due to this fact, and to the liberal size of the ball-bearings, that in the 1908 season there is not a case on record of a broken ball or loose crankshaft bearing, say the makers.

The entire lubrication is by splash, which is made possible by the universal use of ball-bearings in the camshaft, crankshaft, clutch, and all magneto and pump-drive bearings. The main reservoir, which is suspended from the chassis, contains three gallons. The working oiler occupies the space between the motor base and the frame, and contains four metallic piston pumps of the McCord type, the master pump drawing oil from the main reservoir to the working oiler, the next two throwing oil to the crankcase, and the fourth being merely a tell-tale, delivering oil to a single sight-feed on the dash, whence it returns to the reservoir. In the case of the six-cylinder motors an additional plunger pump supplies oil to the base of the third pair of cylinders. This system discards entirely the multiplicity of oil pipes usually found running to various plain bearings. The connecting rod lower bearings being, of course, of the plain white bronze type, are lubricated by a special U-section ring oiler, which receives oil from the splash and by centrifugal force



Off Side of Six-cylinder Lozier Motor, Showing Oiler and Pump.



Components of Lozier Multiple Disc Clutch.

delivers it through interior channels in the crankshaft direct to the bearings. The pet cocks in the base and in the lower portion of the oil pan enable all the oil to be drawn off, while gauge cocks enable the proper level to be determined.

The carbureter is of the central-draft, float-feed, compensating type, with automatic auxiliary air intakes. An especially valuable feature of the carbureter is a variable needle valve, the needle valve orifice opening automatically with an increase in the speed of the motor. A new feature is a butterfly valve connected to a rod projecting through the radiator near the starting handle, to increase the air draft when starting a cold motor. The needle valve is located directly in the center of the float chamber, insuring a uniform gasoline level on the heaviest grades. The double ignition system, first introduced on the Lozier cars in 1904, is still employed without change—the Bosch high-tension magneto, as in the past, being the standard source of electrical energy, the magneto plugs being located in the valve covers on the inlet side. The auxiliary system consists of a high-tension storage battery of 50-ampere-hour capacity.

The cooler is of the well-known Lozier design, containing 2,000 copper tubes. The retention of this type of radiator, while expensive, is compensated for by the manner of easy cleaning with a brush, and in case of damage to the radiator temporary repairs may be satisfactorily made by simply inserting corks in any of the damaged tubes.

Control is by means of the regulation spark lever and hand throttle on a stationary steering-wheel quadrant, the throttle being interconnected with a foot accelerator. The hydraulic governor has been discarded, as the other controls have been found to be all that is necessary.

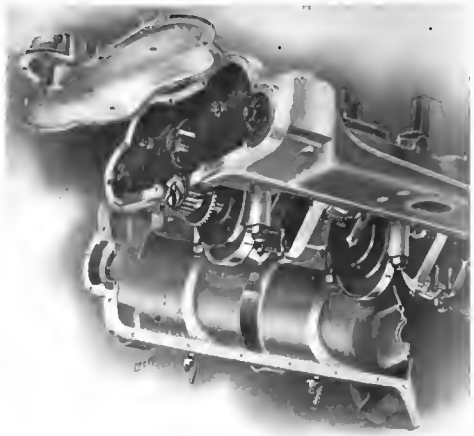
A special feature of the clutch is the fact that it is mounted on annular ball-bearings. It is of the multiple-disc type, containing 33 hardened and ground discs of saw-blade steel enclosed and running in an oil-tight case. The clutch may be slipped indefinitely without danger of over-heating or wear, enabling the car, when desired, to be started from a dead standstill on the high gear. Clutches that have been in use for

Two Views of the Rear Axle Driving Unit.

12,000 miles last season show no perceptible wear o

The clutch pedal is interconnected with the shi locking the gears when the clutch is in place. Thr for by a ball-bearing plate. The connections between shaft stub and the forward end of the drive shaft is by universal joint, consisting of an internal a gear. A special feature of the Lozier car, adopted improved for 1909, is a clutch brake, retarding the tion of the gears and tending to facilitate gear-shift

The gear-set, of the selective type—the standard of the Lozier since 1906—has four forward speeds ; all shifts being made with one lever, third speed ge direct with no gears whatever in mesh. The fou through gears having a ratio of 2 1-2 to 1. The insp on the top of the case is removed by means of wing bolts of which are connected at the lower end by hir they may be dropped out of the way without entire the nuts. A threaded hand-hole plate allows of case with oil without removing the entire top plate and gear-shafts are cut from chrome-nickel steel a on annular ball-bearings. The gears are hardened



Accessibility of the Timing Gears and Main B

nace and pyrometer, and as there has been no case gear in 1908, this method of cutting and temperi mains unchanged.

Details of Shaft-drive Construction.

The propeller shaft of chrome-nickel steel is at angle to the horizontal, and in last year's cars the was dispensed with—a distinct advance in cardan struction. The torsion member now consists of a ing bolted through to the differential case housin the forward end in a sliding sleeve joint with bal member transferring the torsion to a cross-fra The differential is of the bevel type, large and an main drive bevels are unusually large. The final the floating type, the driving shafts being mount pendent annular ball-bearings. As the differential gears are supported on their own ball-bearings, the may be removed independently.

The frame is of the drop type, to get ample sprin clearance and low center of gravity, and is unusua in front to insure small turning radius. The midd very deep, and tapers at both ends. Special cr carry the cooler and grease. The steering gear Lozier construction, all parts being very large; th inclined 45 degrees from vertical. The cross link back of the front axle, and all connecting links socket adjustable joints. All wheels are 36-inch, and 4 1-2-inch rear tires. The wheelbase of the 4 four-cylinder car is 124 inches, the six-cylinder 131

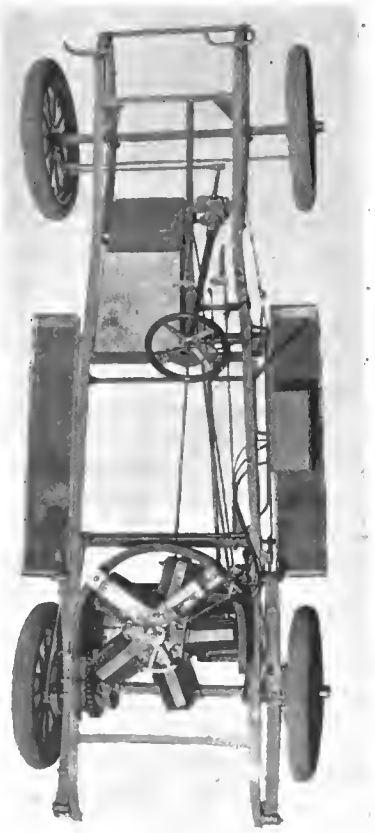
Adams-Farwell 1909 Model Nine

The Adams-Farwell Four-passenger Roadster, Showing High Road Clearance.

IN the 1909 Model Nine Adams-Farwell, the product of the Adams Company, Dubuque, Ia., will be found all the novel features of the Model 7A which preceded it—features which, in fact, have characterized this car ever since its first appearance on the market in 1904. Of course, the central idea of the whole mechanism is the five-cylinder horizontal revolving motor. Although rather startlingly unconventional in design, this motor has been tested by many years' service, and, moreover, its employment results in a truly remarkable simplification of the various accessories.

As may be seen from the illustrations, the five cylinders are arranged like the five points of a star. In the center is the crankshaft, vertical and stationary, the five connecting rods interlocking upon its single crank. The crankshaft being held stationary, it is evident that, when an explosion takes place in one of the cylinders, the cylinders and crankcase will be forced to revolve. A bevel gear keyed to the lower side of the crankcase transmits the power to the change-gear, which is immediately beneath the motor. The first advantage of this unusual arrangement is the elimination of all reciprocating parts. The pistons merely swing around in a circle about the crank, eccentric to the circle described by the cylinder heads. The motor forms its own flywheel, the revolving parts amounting to about 90 per cent. of the total weight. Again, the revolving cylinders act as a centrifugal blower, and cool themselves automatically by the current of air they set up.

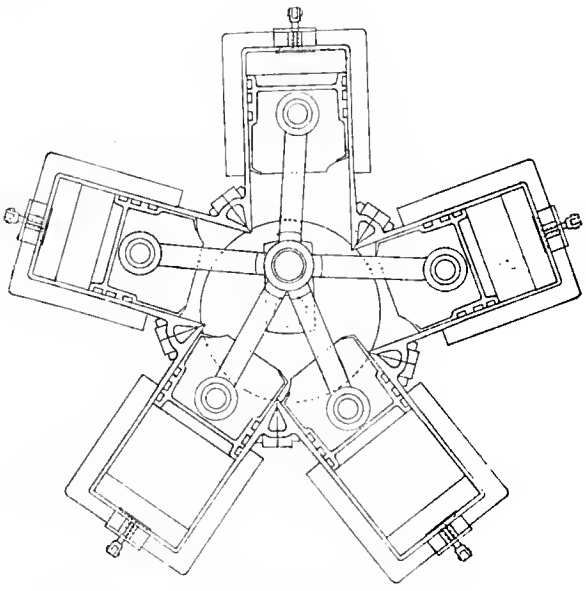
The valves are located in the cylinder heads, actuated by the now familiar walking beam with a single push rod. The push rods from all five cylinders, however, work on a single cam, concentric with the crankshaft, but caused to revolve at a slightly lower speed. The cam is made in two parts, which are movable with respect to each other, thus changing the profile. By this means the inlet valve may be held open during part or all of the compression stroke, giving a range of compression between maximum, 90 pounds, and atmospheric pressure only. The speed of the motor is controlled in this way instead of by throttling. The larger part of the exhaust is discharged through auxiliary ports at the bottom of the piston stroke. As there is never a vacuum in the cylinders, owing to the absence of a throttle, there is no need for any kind of check valves on these ports. No muffler whatever is used, as the wide distribution of the exhaust and the constant current of air rushing past the ports effectually break up the sound. Owing to the action of centrifugal force tending to hold the valves closed, the springs may be made very light.



Plan View of Adams-Farwell Chassis.

The carburetor is stationary, on top of the motor, and consists simply of a spray nozzle, an air valve, and a pump which maintains the gasoline level without a float or air pressure. The inlet pipes are cast integral with the cylinders, and connect with the manifold which surrounds the upper end of the crankshaft; all are of course exactly the same length, so that an even distribution of the mixture is assured. One feature of the carbureter is that it may be taken apart and cleaned without disturbing the needle valve adjustment. With the variable compression system of control, there is never a vacuum in the intake pipes; rather, centrifugal force comes in again and puts a slight pressure on the gas. For the same reason, the motor can be run on a much thinner mixture than usual, as the richest and heaviest gas tends to collect in the cylinder head nearest the spark plug.

Considerable simplification is apparent in the ignition system, principally through the arrangement of the cylinders to act as their own secondary distributor. Each spark plug is connected by a wire to a fiber insulator near the base of the cylinder, and a screw in this insulator is adjusted to make contact with a stationary strip of



Outline Drawing of Adams-Farwell Five-cylinder Motor.

brass to which the secondary wire from the single spark coil is attached. Thus each cylinder in turn picks up the spark as it passes under the brass strip. A timer, a single coil, batteries, and four short wires complete the equipment. Ther a single contact point, any wear affects all cylinder they cannot get out of time.

The oiler is contained in the left leg of the V-shape casting which extends over the engine and has its ap end of the crankshaft. It is driven by a worm gear springs or check valves.

The only noteworthy change from former models the change-gear. This was formerly of the four- driving indirect on all; but as the lowest gear was it was changed to a three-speed type, driving direct The gears are controlled selectively by a lever wor H-shaped quadrant. The clutch is a double cone, bro iron with cork inserts, running in oil; it is enclosed i compartment of the change-gear case. As stated change-gear is immediately beneath the motor, the ing a single unit, which is supported on a three-point Drive is by a single short chain to the rear axle. T 15 inches clearance under the middle of the car.

The five cylinders of the engine are 5 1-2 inche inches stroke, rated very modestly at 50 horsepower. Nine is fitted with two types of bodies, a seven-passe car and a four-passenger roadster; the chassis is t ccpt as to wheel-base, which is 128 inches for the 120 for the latter. Tires are 35 x 4 1-2 both fro There is an unusual amount of storage room on l all the space under the hood and the front seat bei for this purpose. Another convenience which has fo distinguished the Adams-Farwell is the self-starte device worked from the driver's seat.

MOTOR TRUCK DEMONSTRATES ITS ECONOMY

SYRACUSE, N. Y., Aug. 29.—An automobile truck in road construction work near here has furnished some remarkable figures illustrating the great economy of gasoline power over horse power. The truck is a three-ton Chase, made by the Chase Motor Truck Company, of this city, and is fitted with a special dumping body of 3 3-4 yards' capacity. Its work is hauling crushed stone from the crusher located near Skaneateles to a point three miles distant, where a road is in process of construction. It makes eight round trips every day, carrying a total of 30 yards of stone—about 40 tons. On this same work, teams are used at a cost of $5 per day per team. The teams haul 1 1-2 yards at a load and make three trips a day, a total of 4 1-2 yards a day. The truck is consequently doing the work of 6 2-3 teams, and must be worth $33.35 to the contractor.

In its daily operation the truck consumes 12 gallons of gasoline and 2 quarts of oil, costing $1.64, and the driver receives $2.50, making a total operating expense of $4.14 a day. The depreciation on $3,500, the cost of the truck, at amounts to $2.91 a day; interest on investment, $ insurance, $0.20; maintenance and repairs, $1.00. daily expense is therefore $9.05 a day, and the con $33.35 less $9.05, or $24.30 a day.

The Chase truck used on this work is two years the record is not that of a brand new machine, bu average figure of one that has seen hard service in of work. Its work on this job is attracting consid tion in the state engineer's office, as it promises large reduction in the important item of haulage e:

In making the trip from the crusher to the roa necessary to climb one hill a third of a mile long, mum grade of 12 per cent. On this grade the hors quently double up, using four horses to draw the l stone. The truck climbs this hill with its full loa the intermediate gear, using low gear only in the n

Distributing Crushed Stone Along the Road.

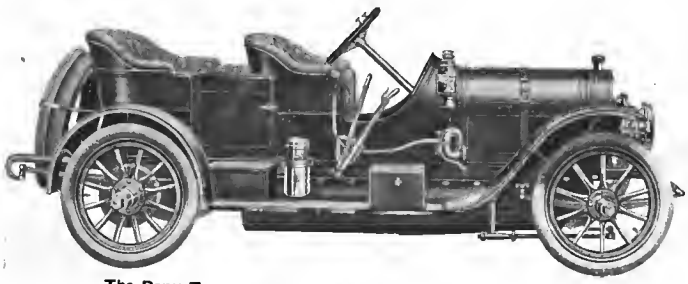
Chase Truck, Equipped with Special Dumping

THREE 1909 MODELS OF THE POPE-HARTFORD

THE Pope-Hartford line for 1909 will consist of three types, built on practically the same chassis: a touring car, a pony tonneau and a roadster. The Pope Manufacturing Company is now well able to face the coming season with perfect confidence. The new models continue the general features of former Pope-Hartford designs; the changes are mostly external. The straight-line body has been adopted, and the hood and radiator slightly modified to correspond, though not so as to impair their distinctiveness. All three models will list at $2,750.

The 30-horsepower motor retains its paired cylinders and overhead valves, but its external appearance has been considerably changed by moving the commutator, magneto and carbureter to the other side and rearranging the manifolds and water piping, with a considerable improvement in accessibility. The housing of the two-to-one gears is now cast integral with the crankcase, and a system of oil pockets and grooves has been provided to secure the lubrication of the gears from the splash in the crankcase. This, together with a new arrangement and a new method of cutting the gears, insures smooth and quiet running. The crankshaft has been increased in size, and its bearings have also been enlarged and are now of a special white brass, instead of phosphor bronze as before. The motor is mounted on a subframe so arranged as to permit the withdrawal of the camshaft and all gears without removing it.

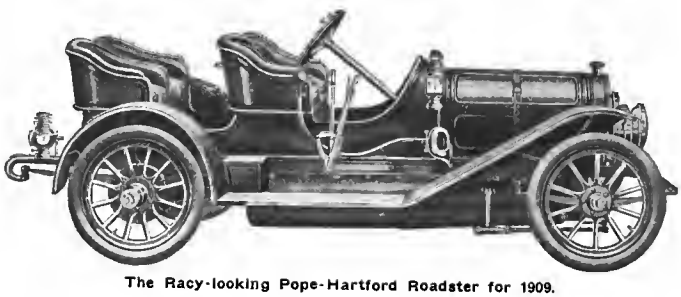
A new design of carbureter has been adopted, containing all the valuable features of that formerly used, with important changes which will insure easier starting and make flooding practically impossible. Ignition is by storage batteries and coils, but a double system with Eisemann magneto and Carpentier coil can be supplied at an extra charge. A mechanical oiler located under the hood, with a sight-glass on the dash, feeds oil to the cylinders; the main bearings are lubricated by splash from the crankcase, suitable pockets and grooves being provided for this purpose in the walls of the crank case.



The Pony Tonneau, the Latest Wrinkle in Body Design.

The transmission system follows standard and conventional lines. The clutch, of the cone type, has been increased 1 1-4 inches in diameter over last year's design, and is covered with a material specially composed for this purpose. The clutch bearing has been considerably lengthened to insure accurate centering of the cone in the flywheel. Between the clutch and the gear-set is a squared sliding sleeve, which compensates for any inaccuracies in alignment, and is adjustable to allow for any possible wear. The change-gear gives three speeds forward, operating on the selective principle. All gears are of chrome-nickel steel and the engaging ends of the teeth are beveled by a new process to insure quick and easy meshing, without noise. All the gear-changing mechanism, with the exception of the hand lever, is enclosed in the gear-case, which is supported on the frame at three points. Drive to the rear axle is through a shaft with two universal joints; a torsion rod of new design, with buffer springs, is provided to relieve it of strains due to rough roads.

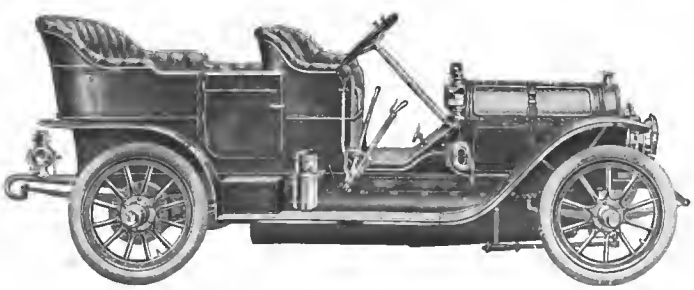
A rear axle of the floating type is used, with Timken roller bearings throughout. A screw adjustment on the bearings of the bevel pinion shaft makes it possible to take up all wear. The bevel pinion has 14 teeth and meshes with a 46-tooth gear. The two sets of brakes are arranged one on a drum just behind the gear-set and the other on the rear hubs. The latter are of the internal toggle type, fully enclosed and adjustable for wear. The front axle is a solid I-beam forging. The distinctive Pope-Hartford frame, of wood armored with steel plates, has been retained, and an additional cross-member provided to support the front end of the torsion lever. The rear springs have been lengthened from 52 to 56 inches and are now swiveled on the rear axle to avoid all strains when putting on the brakes or starting under load. The wheelbase is 113 inches and the tires 34x4 both front and rear.



The Racy-looking Pope-Hartford Roadster for 1909.

The body is much larger and roomier than last year's, and is of the latest straight-line design. The old hooded dash has been abolished and a straight one, of mahogany, substituted, in order to carry out the lines of the body. The sides of the hood are straight, instead of having a double curve, as formerly, and are hinged in three places; but the distinctive shape, which has for several years marked the Pope-Hartford, has not been perceptibly altered.

The chassis of the roadster and pony tonneau models will be the same as that of the touring car with the exception that the motor will be set further back on the frame, necessitating a slight rearrangement of other parts, and the steering column will be given a greater rake. A detachable seat for the chauffeur, on the running board, can be provided on the roadster. The body of the pony tonneau is very short, although affording ample leg-room for four people, and is correspondingly light. The rear seat is rather forward of the axle, which should make it very easy riding, and also leaves considerable room for spare tires and haggage.



1909 Pope-Hartford with Full Tonneau Body.

Palmer-Singer 1909 Skimabout

IF evidences of the renewed wave of prosperity that is already generally felt by the automobile trade, and that bids fair to surpass anything ever known in the history of the industry where the selling during 1909 is concerned, were needed to bolster up the faith of the doubting ones, they could be found in the manufacturers' plans for the coming season. For instance, the Palmer & Singer Manufacturing Company is planning to turn out about 1,000 chassis for the 1909 season, and while this would not be sufficient to place any undue burden on their splendidly equipped plant, it is a more difficult task when it is considered that this number will consist of no less than five different and distinct models. This is the same quintette with which this firm opened the 1908 season, but of the five, two have proved so popular that the original quota of cars had to be multiplied by five in order to keep pace with the demand, and the sales department of the company was so occupied in handling these models that, to quote Sales Manager Botto, "the others were left to sell themselves."

As Seen From the Front.

These two were the Palmer-Singer "Six-sixty," a six-cylinder car of 60 horsepower, and the P. & S. "Skimabout," a special runabout type of car, with a 30-horsepower, four-cylinder motor, and as a result of the great amount of popularity they have been enjoying they are naturally the first of the new line to make their appearance for 1909. The orders for the new series of these two models are already said to exceed the number of cars of this type which were manufactured during the 1908 season. The present factory plans comprehend the construction of series of 250 cars of each of these models, and it is expected that 125 of each of the other three models will be turned out during the course of the coming season, though, judging from the present demand for the two favorites, developments later in the season may make an increase in the figures, where they are concerned, a necessity.

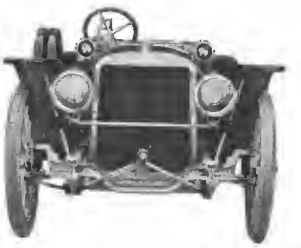
As is evident from the accompanying photographs taken at the metropolitan plant of the company, these two models are already beginning to come through in numbers, the picture showing the "Six-sixty" chassis in the course of assembling. In view of the success with which this model met immediately upon being placed on the market, and the strength of the demand now in evidence for it, there is apparently to be no let-up in the call for cars of the six-cylinder type during the coming season. They have had an opportunity to prove their merits in greater numbers than ever before during the past season, and the manner in which they have done so is quite evident from the demand for sixes for fall delivery.

The only noteworthy change in the "Skimabout" for 1909 is in the shape of the hood and the position of the radiator. Last year, it will be remembered, this speedy little car had a sloping hood somewhat resembling that of the Renault, while the radiator was under the footboards, just to the rear of the flywheel. While satisfactory, this arrangement was found to possess no particular advantage over the conventional one. So the 1909 "Skimabout," as shown in the photographs, has a neatly designed vertical tube radiator mounted in front of the engine, with a folding hood.

Assembly Room of the Palmer & Singer Mfg. Co.'s Factory.

CONCERNING THE SEVEN 1909 AMERICANS

BUILDING seven models in touring car and roadster lines, all fitted with a 50-horsepower motor, but differing in body and other minor details, is the program of the American Motor Car Company, Indianapolis, Ind., for the approaching season. This program shows a unifying of effort, as compared with the present season, in which two styles of motor have been used, one with a 40-horsepower rating and the other with a 50. The characteristic American roadster with its underslung frame is continued with certain improvements which are looked upon to greatly increase its prestige, and the different models of touring cars bear striking resemblance to this year and carry their quota of refinements, as well as those advantages accruing from the use of high-grade steels.



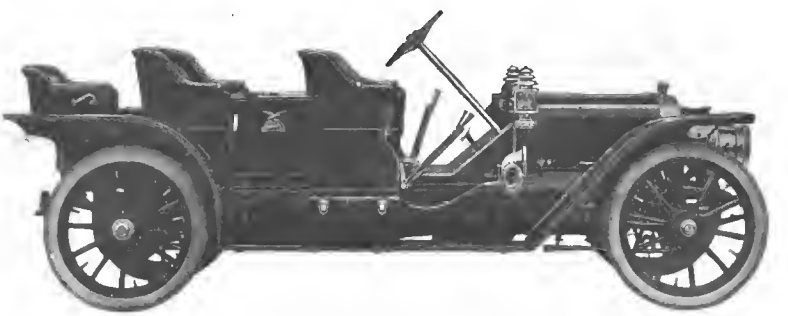
Front View 50-h.p. Roadster.

It is in the roadster, however, that some of the important changes appear. Foremost in this category is the employment of 40-inch wheels, in place of the 36-inch size heretofore used. Adding 4 inches to the diameter of the wheels, in conjunction with raising the wheelbase from 112 to 122 inches, is looked upon vastly to increase [redacted]es of this car, as well as augmenting its speed qualities, it having in tests shown 75 miles per hour with full equipment and passengers. Using the 40-inch wheels has given it a clearance of 12 1-2 inches beneath the horizontal mud-apron, which extends from the radiator to the rear of the body. This car has been christened "the American traveler."

Fifty-horsepower Seven-passenger Touring Car—Mile-a-Minute Guarantee.

American tourist cars are built in five- and seven-passenger styles, the five-passenger type carrying a single rumble seat, which, in reality, brings it into the six-passenger class. The tourist cars carry quite a few different constructions when compared with the roadsters: the roadster employs a sub-frame, to which is attached the motor, transmission and steering gear; the tourist frame construction supports the motor and gearbox direct on the side member of the frame and has these members raised 2 1-2 inches in front of the rear axle to increase the range of the rear spring action. Semi-elliptic springs are employed regularly on the roadster type, whereas on the tourists semi-elliptics are used in front and a platform suspension in the rear. The roadster carries its mechanical lubricator on the dash; the tourist has a similar oiler carried beneath the front footboards. Added to these noticeable changes are differences in radiator design, difference in steering column inclination, different location of control levers and parts, and a pressure gasoline feed system from a tank under the dash is used in the tourist types. An interesting feature of the pressure feed in the roadster is that the gasoline from the 22-gallon tank carried on the rear of the chassis is forced by exhaust pressure to a 1-gallon tank located higher than the carbureter and in which tank is a regulating float, which controls the entrance of gasoline from the main tank. From this auxiliary tank the fuel feed is by gravity to the carbureter. The object of this extra tank is that the carbureter is relieved directly from feed by the exhaust pressure. It is claimed that, where exhaust pressure feeds the gasoline direct to the carbureter, when the first sinks, opening the needle valve, and allowing extra gasoline to enter the float chamber, this gasoline is injected in a stream, which the weight of the float is incapable of immediately counteracting at the correct moment it should—with the result that the float chamber is fuller than it should be and there is danger of an overflow into the carbureter at the spring nozzle. With gravity feed from a small tank, the pressure on the carbureter is not so great, and consequently the danger of interfering with the nicety of float control is diminished.

The motor employed in all seven models is a conventional design employing four cylinders cast in pairs, each of the twin gray iron castings having an integral valve compartment on the right side in the bottom of which are contained, side by side, the nickeled steel intake and exhaust valves. These cylinder castings are supported on a two-part crankcase, the upper part being the supporting member for the crankshaft as well as taking the support of the motor on the frame, thereby limiting the functions of the lower half to that of an oil reservoir. Care is bestowed on the machining of the cylinders, each cylinder casting, after the first rough boring, being annealed to remove stresses which may exist in the casting, after which it is left to age before taking the final grinding. Each of the four pistons comes in for similar treatment, and, to retain the motor compression to the highest degree, a special grade of metal is employed for the piston rings, which is claimed not to lose its elasticity when subjected to heat. Considerable stress is placed upon the offsetting of the crankshaft. For the benefit of the amateur motorist a word of explanation may be used. In the



Fifty-horsepower Touring Car, with Five-passenger Body Equipment.

American Rear Axle—Two Sets of Expanding Brakes.

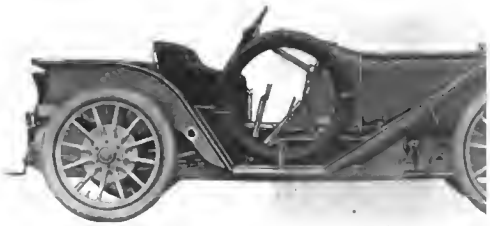
regular motor, the crankshaft is directly beneath the center of the cylinder board, but in the offset shaft it is placed nearer the right side, the reason of this being that on the explosion stroke the connecting rod has less angularity than if the crankshaft were located in the center. This diminishing of the connecting rod angularity reduces the pressure on the side of the cylinder during the explosion stroke, which should result in an increase in power, a diminution of the wear on the piston rings and a reduction of the vibration in the motor. With the offset crankshaft, while the angularity of the connecting rod on the explosion and suction strokes is lessened, it is true it is increased on the compression and exhaust strokes, in both of which, however, the work done is small in comparison with that of the explosion stroke. Connecting rods are special alloyed steel forgings, built in "H" sections, carrying hardened bronze bushings in their upper ends, where they attach to the wrist-pins, and have at the lower ends the usual marine construction with a cap secured by double-nutted bolts and split pins. Lastly, and most important of the moving parts of the motor, comes the forged crankshaft made from a solid billet of steel, after which it is heat-treated and machined to balance. Freedom from vibration is aimed at by finishing the bearings to accuracy with a grinding process. In attaching the different gears to the camshaft, as well as to the other motor shafts, the use of a flange on the shaft to which the gear bolts is resorted to.

In manufacturing the cylinder castings, the large aluminum plate acting as a lid or cover to the water jacket in each twin casting is made use of, the claimed advantages of such construction being the certainty of removing all core sand in the foundry, as well as the increased facilities offered for cleaning.

Viewed exteriorly, the motor is a well-balanced unit, in spite of its design calling for the location of both sets of valves on the right side. Grouped on the right are the valves, the carbureter, the timer for one set of ignition and the intake and exhaust manifolds; on the other side, a casual inspection reveals the Bosch high-tension magneto and the centrifugal water pump, the pulley on the end of the pump and magneto shaft for driving the fan and, in the roadster motor, to these must be added the gravity feed gasoline tank carried opposite the space between the cylinder cas order to avoid puncturing the half-time gear ho fan pulley on the pump shaft is located in the rear of ing.

Intake and exhaust valves, made interchangeable, an from the same camshaft, have the push-rods and rol ened, and the push-rod guides are secured in the cra a four-arm yoke with center bolt; one yoke securing for the intake and exhaust valves for each cylinder. ends of the valve push-rods are threaded to take an and lock-nut for valve timing. The intake manifold piece casting made with easy curves, and the exhaus (a large-sized malleable iron casting) is of the horiz piece type and is ribbed to increase strength. Locati take manifold below and closer to the cylinders than th manifold has the advantage of tending to prevent the tion of the mixture en route from the carbureter to th

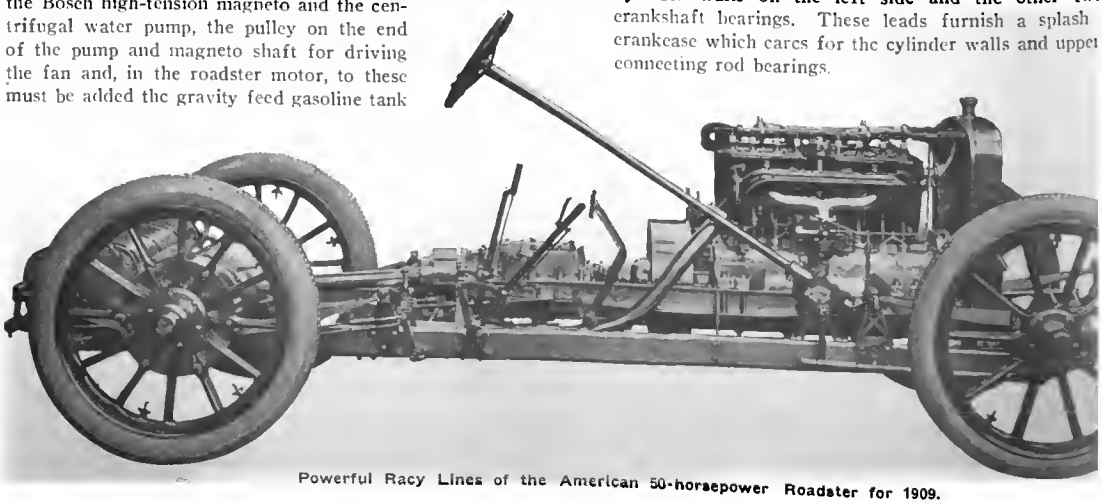
Ignition is by two independent sets, the main one high-tension magneto which incorporates within itself for high-tensioning the current, the make-and-break the distributing means. With a system of this na carried on the dash or beneath the car seats are done and distributers or commutators on the engine are Wiring is reduced to a minimum. The supplementary system is a storage cell, the low-tension current fr is high-tensioned through a roller type commutat



Solid and Compact American Roadster—50-h.

on the top of a stationary aluminum housing on the of the motor between the front and rear cylinder cas vertical shaft carrying the timer takes its drive fro shaft through helical gears, and, in advancing or re spark, the commutator part carrying the wires rema ary, the advance or retard being accomplished by ch relation between the gear on the camshaft and that o shaft. The wiring is run through fiber tubing and th on the spark plugs are so designed as to be removed engine, when it is in operation, without danger o

The lubrication of each model calls for a six-spe ical lubricator, four of the leads of which connec cylinder walls on the left side and the other tw crankshaft bearings. These leads furnish a splash crankcase which cares for the cylinder walls and upper connecting rod bearings.



Powerful Racy Lines of the American 50-horsepower Roadster for 1909.

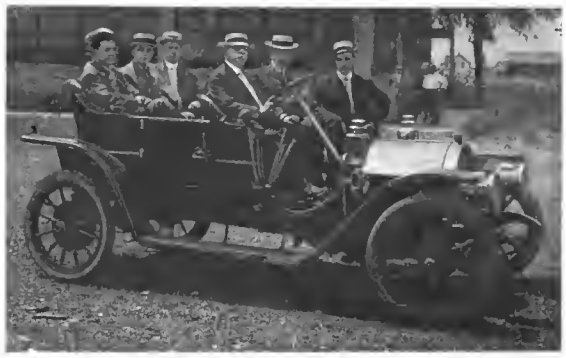
In the cooling system the centrifugal pump located centrally on the left has a double intake to increase its capacity, and in keeping with this is the employment of large diameter pipes. The circulation is from the pump to the jackets immediately beneath the exhaust valve, this being the hottest part of the engine. The exit is from the cylinder heads, the pipe therefrom branching in "T" form to the upper sides of the radiator. The radiators employed in both tourist and roadster types are of the vertical copper tube variety, with 5 1-2-gallon capacity in each. In both radiators the vertical copper tubes are narrow and the radiating quality is increased by the addition of a piece of sheet copper from which there are punched small corrugated fins, which corrugations attach to the tubes by immersion in a solder bath. With this construction all seams in the copper tubes are on the front and back surfaces, permitting of repairing a leak by the use of the soldering iron. In addition there is a 16-inch fan supported on an arm from the front cylinder and driven by a 1-inch flat belt.

First in the transmission system is the leather-faced cone clutch. The thrust is self-contained and is taken on a ball thrust-bearing. In the disengagement of the clutch, the strength of the spring is overcome by giving the clutch pedal leverage a nine-to-one leverage. Between this clutch and the selective gear is a universal coupling in which the square ends of the coupled shaft engage with square driving heads, which are made in halves and divided longitudinally, so that they may be uncoupled by removing the bolts which hold the halves together. This coupling allows of removing either the clutch or the transmission without interfering with the other.

The gear-set, a standard construction, gives four forward speeds, direct on the high, and has a reverse in which the gear revolves only when in use. Chrome nickel steel is employed in all gears, and the shafts are of special alloy steel and are carried on ball-bearings. The shaft which carries the sliding gears has four splines milled on it, a construction which eliminates keys and other parts not integral with the shaft.

Drive from the change-gear is through a propeller shaft with universal to a floating rear axle on the ends of which are claw clutches for engagement with the wheel hubs. A tubular torsion rod completely encases the propeller shaft, and at the front end of it is a universal joint support carried on the cross member of the frame, which acts as the support for the rear end of the gear case.

In a close scrutiny of the running gears employed on the roadster and tourist cars a standard construction based on conventional lines appear. The touring car frames are built up of two side members and three cross-pieces of alloy steel; the side channel members have a maximum depth of 5 inches, a 1¼-inch web, and 3-16-inch stock. The crankcase acts as a cross member at the front. The roadster frame, of the same stock, has the side members narrowed at the dash to increase the turning angle of the car, and, as already mentioned, employs a superframe. The springs employed on the touring car are 42 inches in front, and the three-part platform suspension of the rear has the side members 48 inches long and the transverse member 39. The side members are offset on the axle so as to make the front end equal in length to the rear end plus half the length of the cross frame, which is supposed to give the same spring action as from a semi-elliptic 67½ inches long. Compression grease cups are provided at the head of each spring bolt.



Officers of the Chalmers-Detroit Motor Company.

E. R. Thomas is at the wheel, with Mr. Chalmers sitting beside him. H. E. Coffin, vice-president and designer, is standing up. In the back seat is J. J. Brady, second vice-president and factory manager, and next to him is F. O. Benzer, secretary; while next to him is Roy D. Chapin, treasurer and general manager.

A NEW RENAULT FOR AMERICAN ROADS.

In order to meet the demand for a car designed to meet the unusually strenuous conditions presented by American roads, Manager Paul Lecroix, of the Renault Frères selling branch, is now importing a new model especially designed for this purpose. The motor is a four-cylinder, 20-30 horsepower type, and is characterized by the usual features that have become familiar on the Renault motors during the last five or six years. But the chassis itself is lighter, shorter and narrower than the standard Renault chassis of the same kind designed for town use. The springs have been reinforced, the Renault liquid shock absorbers fitted, sturdier axles employed, and in every way the car has been fitted to travel over rough roads at a good speed.

The matter of clearance has come in for special attention, full 10 inches being allowed, the wheelbase being 120 inches. While the water-cooling system is of the same type as that which usually distinguishes the Renault, that is, with the copper tube radiator back of the motor and theremo-syphon circulation, the radiator itself, in this case, has been considerably enlarged, and the bonnet has been made much longer. The control levers are much shorter than in the regular type. As a runabout this car is capable of 60 miles an hour, and has been designed with a capacity for high speed on rough roads. The complete chassis tips the scales at 2,000 pounds, and when equipped with a runabout type of body lists at $6,000.

New 20-30-h.p. Renault—Manager Paul Lacroix at Wheel, with Madam Lacroix Beside Him.

THE AUTOMOBILE

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THE IMPORTANCE OF ROAD CONGRESSES.

No more significant indication of the awakening public interest in good roads could be cited than the various congresses of road-makers which are being held in all parts of the country. Last week the American Association of Park Superintendents met at Minneapolis; during the latter part of this month the New Jersey grange and automobile clubs will hold a joint convention at Atlantic City; and then, in October, will come the International Road Congress at Paris.

These congresses mean that road building and maintenance must now be undertaken scientifically. Hitherto, in most parts of the United States we have been working our roads under about the same system as was in use in France at the time of the French Revolution. Every petty road official was left entirely to his own judgment as to how the work should be done. One preferred narrow roads, another wide roads; one said roads should be flat, another said they should be crowned; but nearly all agreed that the best repair materials were brickbats, sod and brush. Some States had laws requiring all able-bodied men to work a certain number of days a year on the public roads, and others allowed property taxes to be worked out in the same way. Nobody ever expected a day's work from a man who was working out his tax, and the occasion was usually looked upon as a huge joke. No system ever inven more ingeniously planned to accomplish nothing

Happily, most of this has been changed. All t thickly settled States, at least, have passed some State aid legislation, and have responsible off charge. But it cannot be expected that the mer priation of so many thousand dollars will insure quate improvement in the roads, or that the of the office of "State road supervisor" or " sioner" at so many dollars a year will instant forth a man competent to fill the position. The of roads—real roads, not strips of unoccupiec is a science, and cannot be learned in a day.

Moreover, it is a science which is just nov going important changes. The increasing use mobiles running at high speeds has introduced a which as yet remains unsolved. Just what da any, a rapidly moving automobile does to a r road does not seem to have been definitely set there can be no doubt that many of the prese damage the automobiles, or, at least, seriously from the pleasure of riding in them. Of cour calamity howlers will say this only proves that t of automobiles should be more rigorously r But this country cannot afford to stand in the progress, even for the sake of preserving a mu and more expensive system of roads than we possess. Most road builders see the matter in tl light, and admit that if our roads and our au do not agree, it is the roads which must be cl

* * *

VANDERBILT RACE AN INDUSTRY'S

Whether one interested in racing, but not in ing war," accepts as logical the attitude of the in its refusal to adopt "international" condi the 1908 Vanderbilt Cup race close to New Y and whether one comprehends how the A. C. energetic part of it, became convinced that it v fied in running at Savannah what is practically in this country for the European makers, that person would still wonder at the continuance o tion which threatens a chaos in competition ar sequent loss of interest by the general public. bile racing of the high-speed sort is not desti long life. The A. C. A. may have the credit ening it considerably, and the price which it will total not a few thousands of dollars. C the racing element of the club will stubbornly o compromise as long as it can have its bills O occupy the center of the stage. But the reckoi come sooner or later.

Just now it does look as though the America would see how much it is to their advantage t the support of the classic Vanderbilt, and h selves by helping it, and leave the foreigners t themselves in the Southland with a minor editi French Grand Prix. The wisdom of the Ki pany, the Mora, Acme, and Chadwick should ample for a deluge of American entries for w "American event," will be of far greater imp automobile-buying public than a race designat ternational." A Vanderbilt race failure will l tive injury to the industry. It should not possible by any controversy of the moment.

KANSAS CITY CLUB LOYAL TO A. A. A.

President William H. Hotchkiss, of the American Automobile Association, Tuesday received the following telegram from the Kansas City Automobile Club, which is self-explanatory:

Cannot understand why rumor is so persistently circulated that the Automobile Club of Kansas City has withdrawn from the American Automobile Association. We wish to express to you most emphatically our allegiance to the American Automobile Association and to authorize you to deny any statement to the contrary. (Signed) W. W. COWEN, President,
Automobile Club of Kansas City.

BUFFALO CLUB LEADS IN ACTIVE MEMBERS.

BUFFALO, Sept. 1.—The Automobile Club of Buffalo, of which Frank B. Hower is the president and D. H. Lewis is the secretary, now has 1,394 active members, which gives it the largest active membership of any club in the entire country. The Automobile Club of America only has 1,307 active members, though it has an associate list of 335.

President Hower anticipates that the Buffalo club will have 2,000 members before the end of the year. In view of the fact that the best results for automobiling generally are the prime consideration of the club, it believes that members and a moderate membership fee constitute the best means of securing that which is desired.

LOUIS KISSEL VICTIM OF ASSASSIN'S BULLET.

MILWAUKEE, Wis., Aug. 31.—Louis Kissel, president of the Kissel Motor Car Company, of Hartford, Wis., is dead, the result of an assassin's bullet. Mr. Kissel was shot in his office on August 20 by John Gerbier, a Polish employee, who had fancied grievances and gave Mr. Kissel no opportunity to hear them. Mr. Kissel lingered between life and death in the Milwaukee Hospital here until Friday, when life ebbed away. Septic peritonitis was the immediate cause of death. Mr. Kissel was born in Germany on August 14, 1838. He came to Washington county, Wis., at the age of 19. Thirty-five years ago, having gained a competency on his farm, he moved to Hartford, the county seat, and with his sons established the city's first important industry, the Hartford Plow Works. He founded the Hartford Lumber Company, the First National Bank of Hartford, the Northrup-Tenteal Fur Company, the Hartford Electric Company, the L. Kissel & Sons Co., manufacturers of implements and vehicles, and lastly, the Kissel Motor Car Company, which has come to be the most important and largest industry in east central Wisconsin.

MITCHELLITES HAVE FAMILY REUNION.

RACINE, Wis., Aug. 31.—Concluding the most novel three-day conclave of agents that ever assembled at a motor factory in annual business-pleasure meeting on last Saturday evening, 125 men, who dispose of the Racine-made cars, left their homes, which are in 34 States and far-off Alaska, Porto Rico, and the City of Mexico, bound in honor to dispose of more than $4,000,000 worth of 1909 Mitchell cars—the estimated output of the big works.

President William Mitchell Lewis, of the Mitchell Motor Car Company, Sales Manager James W. Gilson, Secretary G. V. Rogers, Designer John Bate, and James Cram, who acted as hosts for the annual "family gathering," provided a three-day melange for the men who sell cars and address the company officials familiarly as "Bill," "Jim," "Jack," etc., that began Thursday, August 27, with an inspection of the enlarged plant and soon changed to a series of luncheons and dinners at the Racine Golf Club, with a special performance at a local theater monopolized for the evening by the Mitchell company for its guests. Practically all of the allotments for the 1909 output were made in a short session in Mr. Gilson's office on the morning of the first day of the convention.

TIRE PRICES GENERALLY LOWER.

CHICAGO, Sept. 1.—As anticipated, to-day saw a general revision of list prices on motor car tires by the leading makers. Some of them have not as yet made their formal announcements, but those that haven't declare they will have their statements ready inside of a week. However, the Fisk, Diamond, and Goodrich came out with their announcements to-day, while the G & J, Goodyear, Firestone, and Morgan & Wright have their lists about ready to give out.

Without going into details, it is evident that there has been a general reduction all along the line, which will average up at about 15 per cent. The users of big tires will profit more by the reduction than any one else, in some cases the reduction on tires of 36-inch sizes amounting to 20 per cent.

The Fisk company held its session here in Chicago last week. Following this meeting, B. H. Pratt, of the company, had the following to say:

"This revision of prices means that the tire business is down to a hardpan basis. It means that the tire manufacturers will have to do twice as much business to make the same profit as they did in the year just ending. But we are not complaining, for the outlook justifies us in revising the lists. The new list means that the percentage between the tire companies and the dealers and makers will be cut down and that the users of tires will be the ones to profit most. It also means that the price-cutters will be frozen out and that the trade will be thrown into legitimate channels, that is, the dealers and garage people will get the business. The reductions range from 14 to 20 per cent., as, for instance, in the bolted tires made by us there is a 20 per cent. reduction in the 36 by 5-inch size."

"The G & J prices are not ready to announce yet," declared F. S. Cropley, of that concern's Chicago branch. "We are going to have a new list, though, and as is the case with the others, it will average about 15 per cent. reduction. The consumer is going to be the one to profit most by the changes, and the dealers' profit is going to be cut about 10 per cent. by all the rubber concerns."

REDUCTION IN TIRE PRICES ANNOUNCED.

AKRON, O., Aug. 29.—The Diamond Rubber Company announces a reduction in the price of their tires averaging 15 per cent., to go into effect September 1. Perhaps the most notable feature of the change is the placing of the quick detachable type of tires on the same price basis as the regular clinchers for one-piece rims. This is especially important for the reason that the quick-acting rims are being used more and more every year. However, the prices for 1909 are materially lower for every type of tire and for tubes as well as casings.

"The standardization of tires has made rapid progress," said Theo. Weigele, of the Diamond company, recently, "and in time to come will go still further. Quality and price will, of course, both be factors in the public's selection. We are able to join with the automobile manufacturers in the reduction of price by reason of our increased output and improved manufacturing methods. And in more ways than simply lower prices will the automobile owner get more for his money. The improvements we have made considerably increase the mileage tires will give and reduce tire repair bills at the same time. We plan to keep our plant in operation to its fullest capacity right through the fall and winter, and our output of 1909 goods, dating from this time, will be about 100 per cent. larger than last year."

BRUSH CLIMBS TO TOP OF PIKE'S PEAK

DETROIT, Aug. 31.—Trinkle, the driver of the Brush efficiency car No. 3, wires from the summit of Pike's Peak: "Brush climbs all way on its own power."

"Brush No. 3" is one of the five Brush runabouts which were recently dispatched from this city to various parts of the country on demonstrations of their efficiency.

LIVE DOINGS OF THE AUTOMOBILE CLUBS

JERSEY CLUB DETECTS FRAUDULENT TRAP.

NEWARK, N. J., Aug. 31.—Following a number of complaints about the method of operation of Justice Housell's police trap at Highland Park, just outside of New Brunswick, the Board of Directors of the New Jersey Automobile and Motor Club instructed J. H. Wood, a member of the Legal Committee, to inspect it and obtain evidence to be brought before the State Motor Commissioner. Mr. Wood located the trap and watched its operation for some time. The timing was done by two boys, over an alleged quarter-mile stretch. The signaler at the beginning of the course stood over a hundred feet inside of the mark and signaled most cars when they came opposite him. When a car was going slowly he did not signal until it had gone two hundred feet past him, thus depriving the car of about one-fifth of the course. If the car covered this distance in less than 35 seconds the stop-watch man signaled to the constable, a quarter of a mile further down the road, who in turn arrested the driver. Justice Housell at first said he had had the course surveyed, but could not produce a surveyor's certificate. Later he admitted that he had used a tape measure. The constable and the two boys received fifty cents apiece for each arrest. The matter is now in the hands of the club's attorney. As a bald attempt at fraudulent extortion New Jersey automobilists consider this, the latest effort to hold up law-abiding drivers, to be about the limit. It is hoped the matter will be pushed to the limit and the offending "justice" severely punished.

NEW YORK CLUB NOW PLANS SCENIC TOUR.

NEW YORK, Sept. 2.—The "Ideal Tour" of New England, promoted in the early Summer by the Automobile Club of America, proved so picturesque and pleasurable to the coterie of participants that the club plans an Autumn run. The route selected by its bureau of tours is deemed rich enough in scenery to justify naming the proposed junket-a-motor "the scenic tour." It will be an eleven-day run, starting on September 28 and ending on October 8. The itinerary mapped out follows:

Sept. 28	New York to Mt. Pocono, Pa., via Del. Water Gap	100
Sept. 29	Mt. Pocono to Binghamton, via Wilkes-Barre	91
Sept. 30	Binghamton to Watkins	72
Oct. 1	Remain at Watkins	0
Oct. 2	Watkins to Richfield Springs	124
Oct. 3	Richfield Springs to Lake George	105½
Oct. 4	Lake George to Bluff Point (Plattsburg)	105
Oct. 5	Remain at Hotel Champlain	0
Oct. 6	Bluff Point to Manchester, Vt., via Burlington	108
Oct. 7	Manchester, Vt., to Waterbury, Conn	138
Oct. 8	Waterbury, Conn., to New York	92
	Total	935½

The route chosen crosses the Pocono and Catskill mountains, the foothills of the Adirondacks, enters the Lake George and Lake Champlain region and carries the caravan finally across the Green Mountains, whence the finish in New York will be reached by way of Waterbury, Conn. The route will be marked by green arrows with numbers referring the tourists to route cards.

MARYLAND CLUB TO AID GRAND JURY.

BALTIMORE, Md., Aug. 29.—The Grand Jury of this city has joined forces with the Automobile Club of Maryland in efforts to abolish accidents and reckless driving of automobiles. The jury has adopted resolutions favoring a scheme to compel drivers, whether owners or chauffeurs, to pass examinations and secure licenses showing that they are capable of operating automobiles in an efficient manner. The Automobile Club at its next meeting will take action upholding the resolutions of the Grand Jury. The club already has a bill nearly ready which requires drivers to pass an examination before an efficient jury before being allowed to drive a machine through the city streets and suburban highways.

MINNEAPOLIS CLUB IS A MODEL OF

MINNEAPOLIS, MINN., Aug. 31.—The Minneapolis A Club recently opened its new country clubhouse with ar reception to bondholders. The house has been open three weeks, and has been the center of automobile i the Twin Cities. The plans which have been carried c Minneapolis club have been more pretentious than at pected, and universal satisfaction is expressed at the tained by the officials in charge of the work.

The new clubhouse is located on a magnificent bl Minnesota River valley, 16 miles from Minneapolis, road. It is in the center of a stretch of country whicl many of the most popular drives about the Twin C can be reached by way of Minnetonka, or from St. P or 60-mile drives, or direct from Minneapolis in a 16-r The house has been arranged to provide ample social a Provisions have been made for house parties; a kitcher in the most modern manner, and with facilities for c 200 guests has been built; and a café service equal to in the cities has been inaugurated.

The social end of the Minneapolis Club is subordina ever, to the interests which induced its organization conspired to its growth. Directors of the club empl

New Country Club House of the Minneapolis Automol

fact that the erection of the new $20,000 clubhouse maintenance of the town and country houses, is sole purpose of reaching all interests of the automobilist, a to the strength and activity of the club. The Minnea has now a membership of 700, and this number is expected to reach the 1,000 mark this winter. With t strength, the club will greatly extend the scope of its protecting the rights of the automobilists from unjust l in pushing good roads work along scientific lines; an piling touring information, and providing signposts boards for the traveled roads of the State.

The clubhouse just completed was erected by the $15,000 worth of bonds. It has been constructed in modern manner of concrete throughout, and is a mod club building. The total length of the structure is In the center is the main section of the house, t high, and containing the main reception room, the furnished in Flemish oak, the offices, and on the se sleeping quarters and bathrooms. The whole struc model of modern comfort and simple elegance.

A porch 90 by 35 feet runs across the river fro building. It is enclosed by wire netting, and is arrang the summer as a dining room, and from this porch a be had up and down the river for almost 25 miles. furnishings of the clubhouse, designed by George H chairman of the building committee, are all represe parts of automobiles, and carry out the spirit of the

The club has ten acres, running down to the Minnesota River, and is figuring on the aequisition of eight more aeres.

The Minnesota River is a favorite stream for canoeists. Plans are now being made by the automobile club for the building of a harbor 60 feet square, at the foot of the club's grounds, and the arrangement of storage place for 100 canoes, under the broad porch of the clubhouse.

Great credit is given to the directors of the club, and the building committee, for the hard work they have done. As chairman of the building committee, George H. Daggett gave personal attention to all the details of the work. R. R. Colburn, of the firm of Kees & Colburn, the clubhouse architects, and C. F. Haglin, the contractor, were both members of the building committee. The other members were Col. Frank M. Joyce, Harry E. Pence, and E. L. Brown.

BINGHAMTON AND SCRANTON GET ACQUAINTED.

BINGHAMTON, N. Y., Aug. 29.—The Board of Governors of the Binghamton Automobile Club, at a meeting held August 19, accepted in behalf of the club the invitation of the Scranton Automobile Club to participate in a meet which the latter club will hold on the Hartford Fair Grounds September 5. They expect to have a number of fancy races, a tug-of-war, with Binghamton on one side and Scranton on the other, a ball game, a tire-changing contest, an obstacle race and an egg race. In the egg race a basket is placed at the starting point and at distances of 100, 200 and 300 feet other baskets containing eggs are placed. The contestants, consisting of a lady and a gentleman in each car, start at the signal from the starting point, the lady being armed with a teaspoon, and at either the first or last basket, as they see fit, the lady dismounts, takes up an egg in the teaspoon and carries it to the starting point, where she deposits it in the basket without touching it with her hands. The one safely depositing an egg from each basket in the basket at the starting point wins the race.

The main object of the meet is for the automobilists of this section to become better acquainted, with the ultimate object of forwarding the good roads movement.

OCTOBER DATES FOR CLEVELAND CLUB.

CLEVELAND, Sept. 2.—The dates for the Cleveland Automobile Club's reliability contest will be Oetober 7, 8, and 9, while the course will in all probability be a three days' triangular affair. Last year the cars ran in and out of the city each day, but this plan was found not to give any too much satisfaction.

A. C. A. ACQUIRES MORE REAL ESTATE.

NEW YORK, Sept. 1.—The Automobile Club of America has purchased three lots on West Fifty-fifth street in the rear of its present holding. The price paid was $150,000. An addition to its present clubhouse will be built affording more garage room and an entrance on two streets.

ANOTHER CONNECTICUT BELIEVER IN SIGNS.

WILLIMANTIC, CONN., Sept. 1.—The recently formed Automobile Club of Willimantic has outlined a vigorous sign posting campaign and will expend surplus funds in this direction rather than otherwise.

MORE SPACE FOR INDEPENDENT SHOW.

Applications for space and diagrams for the international show to be held at Grand Central Palace, New York, December 31 to January 7 next, have been mailed from the executive offices. Extra space has been secured by converting the big room heretofore used as a vitagraph theatre to exhibition purposes and by the removal of several partitions. The show committee is to meet to-day to pass upon the decoration scheme and pictorial posters.

HOMECOMING OF THE PREMIER CENTURION.

INDIANAPOLIS, IND., Sept. 1.—A great welcome home was given the Premier Century car last Friday when it reached within hailing distance of the Hoosier capital after a most successful trip through the East and over the route home via Baltimore, Hagerstown, Bedford Springs, Pittsburg, and Columbus, the Glidden Tour route of 1907. The welcome took place in the form of a chicken dinner at Greenfield, twenty-five miles east of Indianapolis, the company having as its guests about fifteen local and out-of-town autoists.

When Pilot Joseph Moore arrived at Greenfield his car had gone 10,625 miles, but to hear his engine, one would not have suspected that he had driven one-fifth that distance. Every cylinder was hitting to perfect time and the running could scarcely be heard. The condition of his engine was remarkable in the fact that not one part of its equipment has been replaced nor has it received more than ordinary care due an automobile. Moore stated positively that the only thing done to it was to fill it up with gasoline, water, and oil before starting each day.

What has proven to be one of the most interesting chapters in motordom was started on June 1. On that day the Premier Company started one of its stock cars on the run of 100 miles a day for 100 days in order to demonstrate the good qualities of

Premier Century Car in Foreground.

Joe Moore is drtvtng. All cars in picture took part in Glidden tour. Thts party welcomed Moore on his return to Indianapolts.

the motor car of to-day. The car was run the required distance every day around Indianapolis for a while and was then driven to Chicago and return. After a few more trips around the Hoosier capital it was driven to Buffalo to take part in the Glidden Tour as a press car, and incidentally it covered far more than the 100 miles a day scheduled. It went through the tour in good shape, making every control on time. Following the finish of that event it was driven to Boston, New York, Washington, Philadelphia and several other Eastern cities. It was then headed towards home. The stunt of the century is officially scheduled to end September 8, but it has not been definitely decided as yet where the last day's run will be from. Announcement of this will be made later.

KOKOMO'S FIFTEENTH AUTO ANNIVERSARY.

INDIANAPOLIS, IND., Sept. 1.—A large number of automobile enthusiasts from this city will go to Kokomo tomorrow, where the fifteenth anniversary of the founding of the automobile industry in Kokomo will be celebrated.

Just fifteen years ago Elwood Haynes built his first gasoline automobile, now on exhibition in the Smithsonian Institute. Shortly afterwards the Haynes-Apperson Automobile Co. was organized, developing later into the Haynes Automobile Co. and Apperson Brothers.

A program appropriate of the occasion has been arranged and thousands of visitors are expected in the city.

News in General

Holsman Brigade Figured Prominently In Recent Hill Climb at Algonquin, Ill.

The Substitution Evil.—All automobile owners who take an active interest in the welfare of their cars realize the importance of using a proper grade of cylinder oil. Unfortunately some dealers make a practice of selling cheap and worthless oils under the names of reputable brands, and manufacturers of high-grade cylinder oil find it practically impossible to protect their interests and those of their customers against this substitution. The G. A. Haws Company, manufacturers of Panhard oil, quote a letter from T. T. Southwick: "Now I am a manufacturer and an active competitor, but I mean to be a decent one. It is an outrage on reputable manufacturers of high-grade oils and on the consumer who pays the price of a good oil for dealers to substitute an inferior oil, and yet I know, and you know, it is widely practiced, and that, too, by a class of dealers and garages that ought to be above such petty trickery. I know of large garages that sell from four to six brands of oil, and they buy only one, and pay less than 15 cents a gallon for it." These cheap oils are practically certain to cause heavy deposits of carbon in the cylinders, and the dealer who supplies them to an automobilist trying to buy a good oil not only defrauds his customer, but also risks ruining an expensive engine.

A Farmer Who Dissents.—In the opinion of a prominent Wapping farmer, the motor car is the greatest plague that exists on the country roads for the resident that suffer in consequence. He states: "The evils are numerous, fast running, the smell of gasolene, the immense clouds of dust, the destroying of roads, the fear of danger of meeting them, and the destruction of fowls." This individual is of the opinion that people can no longer enjoy their lawns and verandas in the good old Summer time. He is apparently something of a "timer," for he has discovered cars that actually went eighty miles an hour and asks if the next Legislature will stand for this sort of thing. He furthermore contends that the roads of to-day are a failure, bad for the horses' feet, etc. He winds up with a plea for the old roads, meaning, presumably, the soft country dirt variety, where one wallows in the mud after a heavy rain. His neighbors, however, drive cars and seem pretty well satisfied with things in general.

They're After Van.—The creditors of Van's Auto Tire Company, of 792 Seventh avenue, New York, which was incorporated on Feb. 25, 1908, with a capital of $10,000, has filed a petition in bankruptcy. The creditors, who signed the petition, are Republic Rubber Company, $236; the Hartford Rubber Works Company, $652, and the Mutual Auto Accessories Company of America, $268. They allege that the company is insolvent, removed and concealed its entire property except some rubber tools and machines of small value, purchased upon credit goods largely in excess of the amounts usually bought in the regular course of business, and immediately thereafter disposed of the goods, some at less than cost, and the remainder concealed in some place unknown to creditors, and the company kept the proceeds.

Offer for Pope-Waverly Plant.—Albert L. Pope, George A. Yule, and Egbert J. Tamlyn, receivers of the Pope Motor Car Company, have issued a statement to the creditors of the Pope Manufacturing Company which controls the former concern, setting forth an offer of $200,000 for the Pope-Waverly plant made by Herbert H. Rice and Wilbur C. Johnson. The offer is cash, and a hearing will be given on the matter before the Court of Chancery at Newark, Sept. 8. Messrs. Rice and Johnson have deposited $5,000 on account of their offer, the amount to be returned to them in the event of their not acquiring the plant. In the receivers' statement it is announced that the Rice-Johnson offer is the best ever received by them. The court hearing will, of course, decide whether or not the offer can be accepted. The Pope-Toledo hearing comes up on the same day.

Sleepers for Glidden Tour to Denver.—Since the proposal was made that the Glidden tour of 1909 be run from New York to Denver, there has been no little discussion of the practicability of the route from the standpoint of our night accommodations, particularly between Chicago and the Colorado metropolis. A moving camp pitched by professional tent men was the first suggestion. Col. Charles Clifton, of the George N. Pierce Company, is inclined toward the use of special trains. "The trains," says he, "would furnish food and lodging far better than would crowded hotels and at less cost. The tourists would have new, comfortable quarters, and a trouble would be saved by atta gage cars to the train."

Sales Records Broken.—All midsummer sales of Rambler broken during the month of cording to Thomas B. Jeffery & announcement. During last m sales were three times as large August, 1907, in spite of the fa was the greatest year in the his Rambler business. This is rega indication that the attitude of t bile buying public is changing a automobile can maintain its po the year round, appealing to bu in the late summer and fall as spring and summer.

Courses at Columbia Unive lumbia University will offer college year 1908-09 twent courses specially adapted to of technical and professiona These include courses in a chanics, applied physics, elec mathematics. The work begi 26 and continues for twenty- A full description of the cour tained in the "Announcement sion Teaching," which may b on application to the directo sion teaching, Columbia New York City.

Bergdoll to Build Taxi Bergdoll Motor Car Compan delphia, which recently inau first taxicab service in the Q will add to its rolling stock a dozen or more of the veh big shop on the third floor garage at Broad and Wood st Bergdoll is authority for the that the service is already a the new cabs about to be b incorporated several improven the company's experience c Summer has suggested.

A New Color Combination. ton body-building department h new color combination which be as popular as the old Win which first appeared in 1902. rich royal purple, with black m striping, and carmine running is a constant demand for schemes, and many new ones each season, but very few poss merit to survive.

Now They Want More About a year and a half ago of Contract and Supply pu the Hartford Fire Departm cylinder Knox combination c hose wagon. It is now the the Fire Commissioners to motor of increased power, an priation to cover the chan asked for. The car has done service since it was installed.

Gaeth Eastern Demonstr Gaeth car is to be called to t of the Eastern part of the c year in no unmistakable man Pierce, of this city, has just East in one of the 1909 mo car, and will demonstrate it i prominent Eastern centers, a various Gaeth agents.

Progressiveness in Loui authorities of Louisville, Ky., chased a 20-horsepower Cadill for the use of Fire Chief Fill and his aide. The machine with a siren driven from t which is kept continuously in the time the chief leaves headq he arrives at the fire.

Fort Pitt Motor Mfg. Co.—There has has been no reorganization of the Fort Pitt Motor Mfg. Co., according to information received from New Kensington, Pa. It was stated in "The Automobile" last week that George Von Rottweiler was reorganizing the Fort Pitt Co., but the latest information supplied is to the effect that he is organizing a new concern, of which he will be the head.

Another Auto Line.—A wide-awake Collinsville, Conn., man has started an auto bus line to connect with the Unionville trolley. The Collinsville trade practically all comes to Hartford, but hitherto there has been no trolley connection nearer than Unionville. This gap will now be covered by the automobile. A Knox truck accommodating twenty passengers will be used.

Forging Plant Resumes.—The Springfield Drop Forging Company, whose plant has been operated for the past five years by the Page-Storms Company, is, by the expiration of the lease, again in possession of its plant, dies, machinery and fixtures, and will continue making the same line.

Aid for Zeppelin.—The Continental Caoutchouc and Gutta Percha Company of Hanover has subscribed £750 to the Zeppelin fund.

IN AND ABOUT THE AGENCIES.

Studebaker.—A new company has been formed to represent the Studebaker in Harrisburg, Pa. It will make its headquarters at the old garage of the Capital City Auto Company on Market street, and in addition to its agency business, will carry a full line of supplies and accessories. A first-class repair shop is connected with the garage.

Stoddard-Dayton.—Andrew S. Robinson, formerly connected with the Harry S. Houpt Company, agents for the Thomas car in New York City, will on September 8 take up new duties as sales manager for the Hamilton Auto Company, Philadelphia agents of the Stoddard-Dayton.

B. L. Toplitz-H. H. Holmes.—The Allenhurst garage of New York has discontinued the Midland agency. Its managers, Messrs. Toplitz and Holmes, are in the West arranging for another agency, said to be of a well known and established line of cars.

"Autogas" Tanks.—The New York branch of the Avery Portable Lighting Company, Milwaukee, Wis., makers of the "Autogas" acetylene tanks, will remove Sept. 1 to 243-5 West Fifty-seventh street, in the New Thoroughfare Building.

Schacht.—The Audubon Garage and Machine Works, 415 West One Hundred and Fiftieth street, New York City, has taken the New York agency for the Schacht high-wheel runabout, made by the Schacht Manufacturing Company, Cincinnati, O.

Reo.—Otto Owen, brother of R. M. Owen, and B. C. Buxton have organized the Reo Automobile Company and will look after the Chicago interests of that car. Their salesrooms will be at 1218 Michigan avenue.

Schacht Auto Runabout.—The Philadelphia agency for the Schacht runabout has been secured by D. Applegate & Co. and quarters have been fitted up at 326 North Broad street.

Empire Tires.—The Empire Automobile Tire Company, Trenton, N. J., announces that it has arranged for a Cleveland agency with E. T. Horsey, 1268 Euclid avenue.

Lozier.—The General Motor Car Company, Philadelphia agents for the Lozier, has moved into new quarters at 227-229 North Broad street.

PERSONAL TRADE MENTION.

Charles F. Greuter, for some time connected with the Matheson Motor Car Company as designer, is said to be seeking capital with the idea of forming a new company to build automobiles. The concern will start with a capital of $200,000, and much of the material to be used in building the cars is said to be already in sight. The factory will probably be located in Wilkes-Barre, as several sites in that town are said to be under consideration.

George H. Smith.—Prior to his leaving town to take up his new duties as Northern New Jersey representative of the Winton, George H. Smith, former manager of the White branch house in Philadelphia, was tendered a farewell dinner by "The Shock Absorbers," an organization composed of automobile news writers and advertising solicitors connected with the Quaker City dailies

Harry T. Clinton has resigned his charge of the publicity and advertising department of the Association of Licensed Automobile Manufacturers. The resignation took effect Sept. 1. Mr. Clinton has accepted the position of secretary to the contest committee of the Automobile Club of America. This, of course, necessitated his resignation as a member of the A. A. A. racing board.

F. J. Fisher will assume Sept. 1 the offices of secretary and treasurer of the Fisher Body Company of Detroit, Mich., and will also have charge of the general management. Mr. Fisher was formerly with the C. R. Wilson Body Company, also of Detroit.

H. M. Coale, for the past four years connected in various capacities with the Auto-Car Company, of Ardmore, Pa., has been appointed manager of the recently re-established branch house of the company at 249 North Broad street, Philadelphia.

A. G. Southworth has taken the New York agency of the Buick, and will handle it from 1733-35 Broadway, where formerly he represented the Pope Manufacturing Company.

S. A. Miles, general manager of the N. A. A. M., has returned to New York City after his usual Summer vacation at Christmas Cove, Me. He will visit Chicago in the near future on Chicago show matters.

William A. Rutz, formerly New England traveling representative of the Continental Caoutchouc Company, has joined the New Departure Company of Bristol and will cover the western territory.

Alfred Reeves, general manager of the A. M. C. M. A., returned to New York this week from a fortnight's rest on the Maine coast, much improved in health.

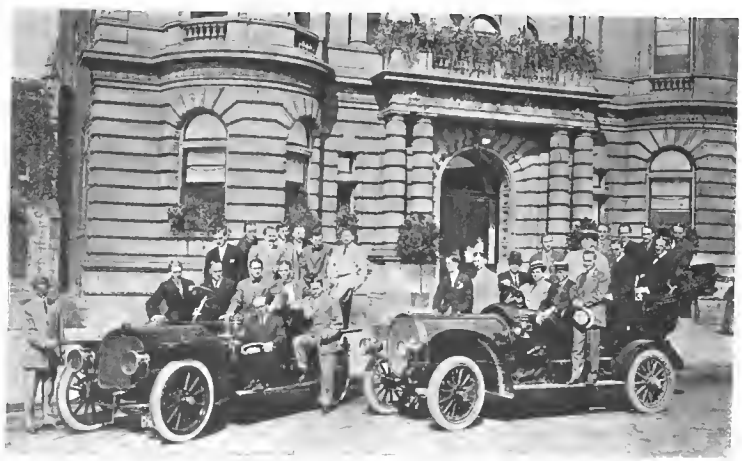
G & J TIRE MEN MEET.

INDIANAPOLIS, IND., Sept. 1.—The G & J Tire Company had a most successful conference of its army of representatives, all parts of the country being represented, as the concern has eighteen branches and distributing agents.

During the three days beginning August 26 there were meetings and entertainments of various kinds. President B. C. Dowse made the address of welcome, and announced that the great demand for G & J tires had compelled an increase of capacity, and the company had purchased a large amount of factory equipment which would be installed in the near future.

Matters of interest taken up and discussed included the 1909 prices and the new lines which will be added. These will be confined to motorcycle and bicycle tires. The G & J factory has been in operation twenty-four hours a day all this season, with its full capacity of workmen.

Among those who spoke during the various sessions were: E. S. Benson, secretary and treasurer; G. G. Hamilton, sales manager; H. H. Halloway, office manager; H. W. Waite, factory superintendent, and George W. Stephens, advertising manager.



Those Who Attended the G & J Conference.

First row (sitting) from left to right: W. B. Harding, purchasing agent; G. H. Hamilton, sales manager; H. A. Githens, general factory representative; B. D. Dowse, president; E. S. Benson, secretary and treasurer; H. W. Waite, factory superintendent; H. H. Holloway, office manager. Second row (standing): H. B. Dwelle, order clerk; C. H. Mead, Portland, Ore.; W. C. Dowse, Chicago, Ill.; F. A. Drake, Philadelphia, Pa.; F. Burodin, Philadelphia, Pa.; F. S. Cropley, Chicago, Ill.; T. V. Graves, Chicago, Ill.; D. B. Price, Boston, Mass.; Saul Levy, Buffalo, N. Y.; D. E. Foote, Cleveland, Ohio; G. W. Stevens, advertising manager; W. K. Philip, New York, N. Y.; C. L. Elyea, Atlanta, Ga.; C. E. Starratt, San Francisco, Cal.; E. H. Sprague, Omaha, Neb. Third row (standing): C. S. Munson, Detroit, Mich.; G. M. West, Los Angeles, Cal.; H. G. Plant, Minneapolis, Minn.; H. H. Hubbard, Indianapolis.

INFORMATION FOR AUTO USERS

New Herz Magneto.—In the design of the Herz high-tension magneto, the manufacturers, Herz & Company, 203 Lafayette street, New York City, have worked very closely to a theoretical ideal, with the view of obtaining the

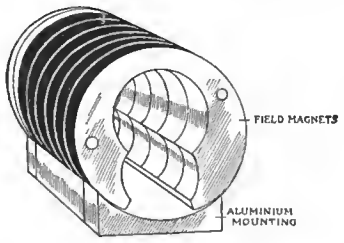


Fig. 1.

highest possible electrical efficiency. There is a marked saving in weight, the whole machine being reduced to a minimum in size, and it is claimed there is a remarkable sparking power at the slowest speed of rotation. A glance at the diagram of the complete machine (Fig. 5) shows that the construction does not follow conventional practice. The well-known "horseshoe" or U-shaped field magnets are absent, and a cylindrical, smooth, all-enclosed field system is seen

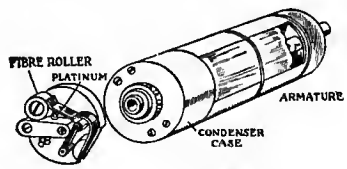


Fig. 3. *Fig. 2.*

instead. The magnet system is in reality composed of several flat steel rings clamped together, their surfaces being ground with extreme accuracy. The next striking feature is that the usual independent pole pieces are entirely dispensed with. In the Herz magneto, the "one-piece" ideal is obtained quite simply, the armature space being bored out of the rings.

The magnet system of the Herz is shown in Fig. 1. The armature, which

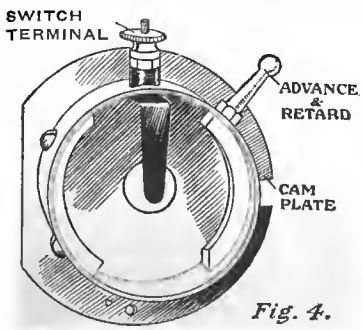


Fig. 4.

is of conventional design, is shown in Fig. 2. The bearings are of the ball type, and the ball cage is detachable from the outer ball race. The contact make and break device, shown in Fig. 3, is arranged as a complete detachable unit, fitted to the armature shaft by means of a small key way and feather. The contact device consists of three parts: (1) a curved spring having a platinum contact at one end; (2) a small steel piece or block set slantwise, carrying an adjustable platinum contact; (3) a small hard fiber roller, loosely centered on a pin. The contact maker turns round bodily with the armature, and in rotating the fiber roller strikes against two steel projections held in a case shown in Fig. 4, and thus the break occurs at the point of maximum induction twice per revolution, and the sparking current is induced in the secondary winding.

The high-tension end of the armature has mounted upon it a deeply recessed V insulating collar with a metallic sector within it at the right-hand end of

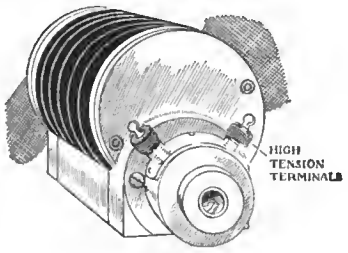


Fig. 5.

armature, which is not visible in the sketch, and upon this sector presses small carbon brushes for drawing off the high-tension current. The machine illustrated in Fig. 5 is a two-cylinder pattern, and in the four-cylinder pattern a high-tension distributer is combined. The casing of the machine is aluminum, forming a dust-tight, smooth and well-finished covering. The single-cylinder magneto weights four and one-fourth pounds, and the four-cylinder machine weighs seven pounds. Every part is made on the interchangeable system at the Herz European factory, and kept in stock by Herz & Company at their New York headquarters.

New Mufflers and Timers.—The Garage Equipment Company, 285 East Water street, Milwaukee, Wis., is just placing two new specialties on the market, the "Anti-Explo" muffler and the De' Paul timer. The distinguishing feature of the former from which it derives its name, is an automatic anti-explosion valve or special cut-out, consisting of a specially designed valve, which relieves the pressure before it reaches the muffler. It is constructed in the best manner throughout, the heads being of malleable iron, while the four tubes are of heavy sheet steel securely fastened at the seams. These tubes are perforated at opposite ends by numerous holes, thus allowing the gas to expand from one tube to the other very rapidly and causing no sound as it escapes from the muffler. It is made in sizes ranging from 6 by 16 inches up to 8 by 30 inches, either plain or with special cut-out valve and exhaust nozzle. The De' Paul timer is made of the best quality bronze, with special high-speed steel rotating spindle. It also has a specially designed, tempered steel roller contact, set by micrometer adjustment, so as to deliver an equal spark to all cylinders at any speed of the motor, thus preventing missed explosions and increasing the efficiency of the motor, besides saving the platinum points of the vibrators on the coils. It is made in sizes to fit all motors and from one to six cylinders. The com makes special types of timers for Ford and Buick cars.

A New Speedometer.—The Specialty Company, of New Yor cently been incorporated by a r men well known in the automo and among other articles they v facture the Peerless speedometer. strument has a mileage and maxir and a season and trip odomete distinguishing feature is the ste the indicator. Realizing the nee pair department for speedometers pany will maintain a shop equipp work, and will repair and r speedometer within twenty-four h

Simplicity Rectifier.—As th tion shows, this is an extremely compact piece of apparatus tha placed anywhere. It is intended an alternating current in order tion accumulators may be charge and is the product of the Auto Manufacturing Company, 2366-2 hill Road, Cleveland, O. No tir cial preparation is required to this is accomplished simply by the switch, and an accidental fail current can do no harm to eith tery or the rectifier, as the batt discharge through the latter, a immediately resume operations current is on again. There is burn out or go wrong and it w on any load within the limits fo is intended, without any fuss and without the attention of an

THE SIMPLICITY RECTIFI

The solution is contained in enameled white, while the elec suspended from a hard glazed top on which are mounted the the lamps employed to vary ance. Type S P will operate o age from 50 to 126 and on any c current up to 5 amperes so that ble of charging three six-volt the same time. At a chargir three amperes, it will consume watts per ten hours. Its dim 7 inches diameter by 15 inches only parts that need renewir chemical solution and the alum trode. These give long service replaced at nominal expense, s cost may be saved many tim the saving effected through accumulators a regular charge

VOL. XIX NEW YORK—THURSDAY, SEPTEMBER 10, 1908—CHICAGO No. 11

THE AUTOMOBILE

LOWELL'S RACE HAS A FOREIGN CAR WINNER

By C. F. MARDEN.

LOWELL, MASS., Sept. 7.—Louis P. Strang added more laurels to the crown of victory to-day by winning the 254.4-mile Lowell road race on a 10.6-mile circuit in 4 hours 42 minutes 34 seconds. He drove the 60-horsepower Isotta Fraschini, the same make in which he won the Savannah and Briarcliff races, and averaged 53.6 miles an hour, faster than had been thought possible. Strang was accompanied by Leo Anderson as mechanician. The car ran perfect from start to finish, and Strang, using Michelin tires, had little trouble, being bothered in this respect not at all until near the finish in the last lap. Strang drove a magnificent race, taking the bad corners easily, and dashing up the stretch of boulevard at remarkable speed. He had four laps on his nearest competitor, the Buick driven by Burman, which, however, was disqualified in the twenty-first round, the referee allowing a protest that was filed by entrants of other cars. The protest was based on the claim that the conditions of the race had been violated, outside help being employed in making repairs on the car. The Buick was stopped at the end of the twenty-first lap, and the time from the twelfth lap was wiped out. The Buick's elapsed time for twenty rounds was 4:41:04. The race was well managed. There was only one arrest—a negro boy being taken up for gambling, and there were no injuries of a serious nature. The crowd kept off the track. Some cars were exceedingly unfortunate with tires, the Fiat and the Berliet being especially troubled in this respect and losing much time.

Second place was won by the 60-horsepower Berliet, entered by the Park Square Auto Station of Boston, and driven by Harry F. Grant. This car had much tire trouble, but depsite this averaged 40.7 miles an hour. It was Grant's first road race, and he received much well-deserved praise for his good work.

The Knox finished third, its elapsed time being 6:33:29. The Fiat was fourth in 6:38:32. The Knox and Fiat had a close race in the last lap, and the excitement held the crowd better than in any previous important road race in this country.

Strang and Winning Isotta in Full Cry.

Weather and road conditions could not have been better. Sunday there was a rain, and it beat down the roads, which already had been oiled and rolled until they were as near perfect as possible. The rain also improved the edges, making the conditions for passing on the back stretch much better than they otherwise would have been. Following the rain came a brisk wind, and the sun rose bright in the morning, ushering in an ideal September day, the sky being cloudless when the hour of starting approached. At that time there was a tremendous crowd all along the circuit of 10.6 miles. The five miles of boulevard was double lined on one side with cars, and on the other side was a dense mass of humanity that led, some into Lowell by train, trolley, and on foot, from all over New England. The big grandstand filled more slowly, as seats there were reserved.

Among the early comers was Congressman Butler Ames, the donor of the trophy. He occupied a box in the front of the grandstand, and in front of his box, opposite the starting line, was the massive silver cup for which the seven cars raced the 254.4 miles, twenty-four times around the circuit. The course was well fenced, and a large force of Lowell police and several hundred militiamen, sworn in as special officers, kept back the crowd very efficiently. The grandstand was admirably located, commanding a view of nearly a mile down the boulevard and half as far in the other direction.

The cars were early at the course, and Starter Wagner had them lined up in order a full half-hour before the first car was due to start. In front was the Simplex, driven by Frank Lescault, with Thomas Colter as mechanician. In order were the Fiat, driven by George H. Robertson, with Glen Ethredge as mechanician; Lewis Strang and his Isotta had Leo Anderson as his companion; the Buick was fourth in line, with R. Burman at the wheel and John H. Le Cain by his side. Fifth place, that was to have been occupied by Al. Poole's Isotta, was empty, but Poole was in the grandstand to witness the race, despite his broken col-

Berliet "60," Which Had Much Tire Trouble, but Landed in Second Place in Good Style, a Novice at the Wheel.

lar bone, received in the accident that put his car out of commission Saturday. The smaller Knox was sixth, William Bourgne driver, Jeremiah W. Lynch mechanician. The larger Knox, with Charles Basle at the wheel and accompanied by Edward A. Burns, was No. 7. Last was the six-cylinder Berliet driven by H. F. Grant, with Frank H. Lee as mechanician.

How the Contestants Got Away at the Start.

It was 9:55 when the Simplex engine was started and she swung into position for the start. There was lacking much of the spectacular effect of the start of a Vanderbilt Cup race; there was no weak morning light, only the full sunlight. But to the spectators who had had good breakfasts the change was agreeable. Minute by minute slipped by, and at exactly 10 o'clock Starter Wagner gave the word and the big grey Simplex was on its journey.

In regular order at one-minute intervals the Fiat, Isotta, Buick, two Knoxes, and Berliet followed up the broad boulevard. Time was allowed for No. 5, so there was a two-minute interval between the Buick and the first Knox. All got away in first-class shape. Except the Berliet, each car had a bonnet. There was an interval of a few minutes, then came the familiar cry, "Car coming! Car coming!" the bugle blew, and at 10:12 the Simplex flashed by, having made the first round in 12:21, or better than 50 miles an hour. The Fiat was close behind, passing 10:122-3, making the round in 11:43. The Isotta had gained a little and was working well when Strang flew by in third place, making the circuit in 11:42. The Buick completed the round in 13:33 and the No. 6 Knox in 14:06. The No. 7 Knox broke down at the upper turn and was delayed several minutes, being passed by the Berliet, which also stopped a little further on. The Simplex, Fiat and Isotta passed the Knox and Berliet, the Simplex finishing the second round at 10:24:35. Its elapsed time for 21.2 miles was 24:35. The Fiat's time was 23:45, and the Isotta's 23:25. This put the Strang Isotta in the lead on time. The Buick completed the second round just after 10:30 o'clock, its elapsed time being 25:26. The No. 6 Knox made the second round in 26:20. The No. 7 Knox completed the first round at 10:33:57, but was not running well.

Going the third round, Strang passed Lescault and Robertson and took the lead. With great applause Strang went by at 10:36:25, his elapsed time for 31.8 miles being 34:25. The Simplex passed at 10:36:50, its elapsed time being 36:60. Tl stopped just beyond the upper turn, and was passed on th stretch by the Buick, its time for three rounds being 38:

The Berliet finished its first round at 10:43:25. The Knox made the three rounds in 41:28. The Isotta, witl to the good over the Fiat, finished the fourth round, com 42.4 miles at 10:48:28. The Simplex finished four rou 10:48:56. Strang had gained three seconds over his opponent in this round and his car was running fine. T 7 Knox finished three rounds at 10:51:18, its elapsed tim 45:18. The Buick, in third place, finished four rounds at 10 The Berliet completed two rounds at 10:55:15, and the Knox four rounds at 10:58:41.

Stirring Finishes in the Early Rounds of the Rac

Robertson had his Fiat going again, and started to m the handicap he was under. At 11:00:06 he finished th lap. The Simplex, finishing the fifth round of 53 mil close behind, having passed the Isotta. The Simplex time was 1:01:06. The Isotta's time for five rounds wa The Buick passed at 11:05:21. Robertson had more trou was delayed only briefly. The Berliet had lost a tire and with the off rear tire gone at 11:09:08. The Fiat finishe rounds in 1:08:23. The Isotta finished six rounds—63.(or one-fourth of the race—at 11:11:59. The Simplex six rounds at 11:13:18. The Isotta made 53 miles in t hour, and was still in the lead. The Buick finished six in 1:59:49, and the Fiat four rounds in 1:19:56. With t one-quarter finished, the Isotta led, the Simplex was and the Buick third. The fastest lap was 10:53, made Isotta in the sixth round.

Driving in his best style and with his car running like Strang made seven rounds (74.2 miles) in 1:21:48. Tl plex made seven laps in 1:28:53, having lost time to the The Buick went up into second place in the seventh elapsed time being 1:27:27. The Fiat came along on lap at 11:33:05, being more than two laps behind the The Isotta finishing eight laps (84.8 miles) and the No. finishing four laps came close together. Strang's elaps was 1:33:28. Lescault, with the Simplex, passed at 1 and Burman's Buick at 11:42:27. Grant, having chang got going again, and at 11:42:40 completed four round

Fiat came close behind, finishing six laps, and the No. 6 Knox was near it, finishing five laps. Strang finished the 95.4 miles of nine laps at 11:46:45, his elapsed time being 1:44:45. The Buick was six minutes behind, and the Simplex two minutes behind the Buick.

Strang Steadily Increased His Lead as Race Progressed.

With a lead of 5 minutes and 19 seconds, the Isotta began the eleventh lap, having made 10.6 miles in 116 min. 35 sec. The Simplex made the distance in 124 min. 56 sec., and the Buick in 122 min. 32 sec. These three cars had about 30 miles lead over the Fiat, which was fourth. At 12:05:55, when the Berliet passed, all the cars had finished six laps, or a quarter of the race. The order was: Isotta, Simplex, Buick, Fiat, No. 6 Knox, No. 7 Knox, and Berliet.

At 12:10:09 Strang finished the eleventh round (116.6 miles). His elapsed time was 2:08:09. The Buick's time was 2:14:17, and the Simplex's 2:16:54. Strang finished half the race (12 laps—127.2 miles) in 2:20:22, or 140 min. 22 sec. The Simplex got a flat tire and stopped to change just in front of the grandstand, giving the crowd a welcome diversion. The Buick passed with the rear wheel wobbling badly. The Simplex's time for twelve rounds was 2:28:52, the Buick's 2:26:53. The Fiat had tire trouble and was delayed for a long time, and the race seemed to lie easily in Strang's hands, as he was gaining every lap. He finished thirteen rounds in 2:31:46, at 12:33:46 o'clock. The two Knox cars and the Fiat were in the ninth lap and the Berliet in the eighth. The No. 6 Knox had crawled up into fourth place and the Berliet into the fifth, the Fiat dropping to sixth. In the fourteenth round Strang lapped the Buick and the Simplex. His time for fourteen rounds (148.4 miles) was 2:44:12. The Buick had trouble, and the Simplex went up to second place, completing thirteen rounds in 2:48:59. The Berliet made nine laps in 2:42:44 and the Fiat the same distance in 2:49:33.

At 12:58:06 Strang's Isotta flew by, ending its fifteenth round. Its elapsed time was 2:56:06. Lescault's Simplex made fourteen rounds in 3:04:08, the No. 6 Knox eleven rounds in 2:55:24, the Fiat ten rounds in 3:02:01, and the Berliet ten rounds in 2:54:21. At 1:09:10, the Buick having made repairs, completed the thirteenth round, its elapsed time being 3:06:10. Strang finished his sixteenth round (169.6 miles) in 3:07:58. The No. 6 Knox finished its twelfth round in 3:07:48. The Simplex completed fifteen rounds in 3:16:11 and was running strongly. Strang dashed by the stand and began his eighteenth lap, having made 180.2 miles in 3:19:37.

Just before 1:30 o'clock the first real brush of the race visible at the grandstand occurred. Lescault's Simplex and Robertson's Fiat came tearing up the broad boulevard side by side. They were almost neck and neck, but Lescault had speed in reserve, and passed his opponent in front of the stand. The Simplex finished sixteen rounds in 3:28:11 and the Fiat twelve rounds in 3:27:10. The Buick made fifteen rounds in 3:29:35.

Strang finished eighteen rounds, three-quarters of the race, covering 190.8 miles in 3:31:16. His machine was running beautifully, and he had two laps on the Simplex and three on the Buick.

Excitement Ran High as Race Neared the Finish.

In making the seventeenth round the Simplex had pulled away from the Fiat and led him by several hundred yards when they again went by the tape. The Simplex's time for 180.2 miles was 3:40:19; that of the Fiat for 137.8 miles was 3:40:59. Strang finished nineteen rounds, making 201.4 miles, in 3:42:43. The Buick was just ahead, completing its sixteenth round. Strang had averaged nearly 55 miles an hour from the start. There was a pretty race up the stretch when Strang finished the twentieth lap, closely pursued by the Buick finishing its seventeenth lap. The little Buick had become a favorite, and the crowd gave Burman a cheer as he went by in the Isotta's dust.

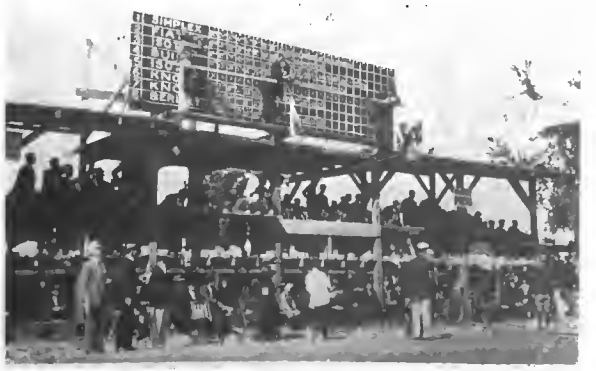
The Fiat finished fourteen rounds in 3:52:55. The Isotta finished twenty laps (212 miles) in 3:54:05. In the fifteenth lap Robertson drove hard and nearly caught Lescault, but he failed to do so, his motor not working first-class. They went up the stretch neck and neck, and Strang was close behind in his twenty-first lap. The Simplex passed at 2:06:54 o'clock, the Fiat at 2:07:01, and the Isotta at 2:07:50. Soon after passing the grandstand the Simplex blew a cylinder. The Buick finished eighteen laps at 2:09:34, its elapsed time being 4:06:34. The Berliet, having more tire trouble, passed at the end of the fifteenth round and threw a forward shoe. It scattered the crowd and the police, but one small boy was so unfortunate as to be hit. He was not hurt. The Berliet and the Fiat were especially sufferers from tire trouble. At 2:19:33 Strang again

Simplex Which Showed Great Speed Up to the Time of the Mishap Which Took It Out of the Race.

Basle and the Knox Which Was Unlucky.

President John O. Heinze of the Lowell Club.

Stand Provided for the Massachusetts Legislators.



Where the Scorers and the Press Men Held Forth.

tore by the tape, making twenty-two laps (233.2 miles) in and, as it seemed, only a few minutes later he rushed stretch again, and Fred Wagner gave him the green f that he was beginning the last lap. His elapsed time for three laps (243.8 miles) was 4:30:49. Though he had practically won, Strang did not let up his pace, and at he finished a winner, but on a flat tire. His elapsed t 4:42:34. Strang was given a fine round of applause as ished.

Four cars were to finish, and the crowd was remark tient in remaining in place, the course being kept clear remaining cars. The Simplex was out with a broken and the No. 7 Knox had withdrawn, losing a wheel in th lap, leaving only the Fiat, Buick, No. 6 Knox, and the B fight it out. A protest was filed against the Buick by of the Fiat, Knox, and Berliet, claiming that it was repai outside help, the radiator being changed. The protest w under advisement, and later allowed by the judges.

Interesting Features of the Finishing Laps.

When Strang finished the Fiat and Berliet were in th eenth lap, the Knox in the nineteenth, and the Buick twenty-first. The Buick was disqualified because of ir of the rules in having outside assistance in making repair man was flagged when he finished the twenty-first round time after the twelfth was thrown out. This put the second, the No. 6 Knox third, and the Fiat fourth at th ning of the twentieth lap. The Berliet finished the t lap in 5:18:14, the Knox in 5:23:28, and the Fiat in 5:2 the next lap the Berliet gained a little on the Knox. T liet's elapsed time was 5:30:31, and the Knox's 5:36:5 Knox in turn increased its lead on the Fiat, the Fiat's time being 5:43:10. The Berliet covered twenty-two 5:42:57, not only holding its position, but gaining on th the elapsed time of which was 5:57:07. The Fiat hac up a little, and its elapsed time was 6:01:48. The Ber running smoothly as it entered the final lap and on th part of the course lapped both the Knox and the F elapsed time for twenty-three rounds was 5:56:11. In t stretch the Berliet had trouble and was passed by the K the Fiat. The Berliet, however, was only temporarily and soon was going again.

At 4:21:58 the 60-horsepower Berliet flashed by, finis race in second place. Its elapsed time was 6:14:58. Th had done excellent work against odds, and Grant had heady race. The Knox led the Fiat by about two minute beginning of the last lap. They made a great duel the way around, and they swung into the stretch close t the Knox having a little the better of it. There was a tussle up the boulevard, but the Knox held its lead and in third place, its elapsed time being 6:33:29. The F fourth, finishing with a flat forward tire. Its elapsed ti 6:38:32. This ended Lowell's first and very successful r

This evening President John O. Heinze and the other of the Lowell Automobile Club entertained the drivers, icians, and officials at a complimentary dinner at the Country Club, at which the trophy was presented. The mac Valley course was duly boomed as the scene of fut portant road races, including the 1909 Grand Prix.

MORRIS PARK AS AN AIRSHIP TRACK

The Morris Park race track, in New York City, o scene of automobile record-breaking, will now be devoted ilar attempts by flying machines. The recently formed nautic Society has secured the use of the track for the us members, together with the grandstand and outbuildings will provide ample storage room. On Labor Day Wilbur l ball, vice-president of the society, gave his helicopter an on the grounds. The machine was rolled around for ins and its motor was run for a while, but no attempt was r send it into the air.

TABULAR STORY OF THE LOWELL, MASS., 254.4 MILES ROAD RACE, SEPT. 7, 1908.

No	CAR	H.P.	Driver	Lap 1	Lap 2	Lap 3	Lap 4	Lap 5	Lap 6	Lap 7	Lap 8	Lap 9	Lap 10	Lap 11	Lap 12
				10.6m	21.2m	31.8m	42.4m	53m	63.6m	74.2m	84.8m	95.4m	106m	116.6m	127.2m
3	ISOTTA.....	65	Strang.....	11:42	23:25	34 25	46:28	59:06	1:09:59	1:21:48	1:33:28	1:44:45	1:56:35	2:08:09	2:20:22
8	BERLIET...	60	Grant.....	36:25	48:15	1:02:08	1:35:40	1:47:24	1:58:55	2:19:30	2:31	2:42:44	2:54:21	3:06:48	3:18:05
6	KNOX.....	40	Bourque....	14:06	26:20	41:28	53:41	1:40:40	1:52:54	2:05:17	2:18:01	2:30:35	2:42:59	2:55:24	3:07:48
2	FIAT.....	60	Robertson..	11:43	23:45	1:08:22	1:19:56	1:32:05	1:43:50	1:56:02	2:37:12	2:49:33	3:02:01	3:14:34	3:27:10
4	BUICK.....	40	Burman....	13:33	25:26	38:40	50:32	1:02:21	1:15:49	1:27:27	1:39:07	1:50:44	2:02:32	2:14:17	2:26:53
1	SIMPLEX...	60	Lescault....	12:21	24:35	36:50	48:56	1:01:06	1:13:18	1:28:53	1:40:55	1:52:56	2:04:56	2:16:54	2:28:52
7	KNOX.....	50	Basle.....	27:57	45:18	1:06:31	1:24:28	1:41:19	1:53:11	2:04:51	Broke a wheel.				
5	ISOTTA....	65	Poole.....	Did not start.											

No.	CAR	H.P.	Driver	Lap 13	Lap 14	Lap 15	Lap 16	Lap 17	Lap 18	Lap 19	Lap 20	Lap 21	Lap 22	Lap 23	Lap 24
				137.8m	148.4m	159m	169.6m	180.2m	190.8m	201.4m	212m	222.6m	233.2m	243.8m	254.4m
3	ISOTTA.....	65	Strang.....	2:31:46	2:44:12	2:56:06	3:07:58	3:19:37	3:31:16	3:42:43	3:54:05	4:05:50	4:17:33	4:30:49	4:42:34
8	BERLIET...	60	Grant.....	3:40:45	3:52:54	4:09:18	4:28:04	4:40:47	4:53:25	5:05:49	5:18:14	5:30:31	5:42:57	5:56:11	6:14:58
6	KNOX.....	40	Bourque....	3:26:35	3:43:48	4:10:41	4:23:50	4:37:12	4:50:15	5:10:50	5:23:28	5:36:54	5:57:07	6:16:46	6:33:29
2	FIAT.....	60	Robertson..	3:40:59	3:52:55	4:06:01	4:28:25	4:40:48	5:00:57	5:15:50	5:29:19	5:43:10	6:01:48	6:18:57	6:38:32
4	BUICK.....	40	Burman....	3:06:10	3:17:50	3:29:35	3:41:25	3:53:07	4:06:34	4:22:15	4:41:04	Disqualified on 12th lap.			
1	SIMPLEX..	60	Lescault....	2:48:59	3:04:08	3:16:11	3:28:11	3:40:19	3:52:37	4:06:54	Cracked cylinder.				

TEN FASTEST LAPS

6th	Strang	10:53 (58.3 m.p.h.)
3rd	Strang	11:00 (57.8 m.p.h.)
9th	Strang	11:17 (56.3 m.p.h.)
12th	Grant	11:17 (56.3 m.p.h.)
6th	Grant	11:21 (56.0 m.p.h.)
20th	Strang	11:22 (56.0 m.p.h.)
2nd	Strang	11:23 (55.9 m.p.h.)
11th	Strang	11:24 (55.8 m.p.h.)
13th	Strang	11:24 (55.8 m.p.h.)
19th	Strang	11:27 (55.5 m.p.h.)

AVERAGE TIME, MILES PER HOUR AND FASTEST LAPS

Strang—Isotta	54:0 m.p.h.
Grant—Berliet	40.7 m.p.h.
Bourque—Knox	38.8 m.p.h.
Robertson—Fiat	38.4 m.p.h.
Bourque's fastest lap	4th, in 12:13 (52.1 m.p.h.)
Robertson's fastest lap	4th, in 11:34 (54.8 m.p.h.)
Burman's fastest lap	9th, in 11:37 (54.8 m.p.h.)
Lescault's fastest lap	11th, 12th, in 11:58 (53.0 m.p.h.)
Basle's fastest lap	7th, in 11:40 (54.4 m.p.h.)

No. 6 Knox Passing the Big Grand Stand, Where the Excellent Arrangements for Spectators Were Plainly Apparent.

HOW THEY WERE MECHANICALLY CONSTITUTED

By CHARLES B. HAYWARD.

LOWELL, Mass., Sept. 7.—Strang's *Isotta* three-time winner, which he drove to victory to-day with the same clock-like regularity that distinguished his performances earlier in the year at Savannah and Briarcliff, has been in the limelight so much during the past half year that its mechanical details are more or less a matter of common knowledge. It has a four-cylinder vertical engine, the metric dimensions of which are the equivalent of 5 7-8 bore by 5 1-2 stroke, thus making it a high-speed motor, while it is rated at 60-horsepower, though, needless to add, it is capable of an output considerably in excess of this figure. An Eisemann magneto is the sole provision for ignition, lubrication being effected by the exhaust pressure, a 12-gallon tank of lubricating oil being carried between the fuel supply tank and the driver's seat. A carbureter of special Isotta design, which, however, does not differ radically from accepted standards, a centrifugal pump and honeycomb radiator complete the motor details. Transmission is through a four-speed sliding gear of the selective type to double side chains, the gear ratio being 2 to 1, which accounts in part for the excellent speed performance of the car as some of the others were geared lower. The wheel base is 122 inches and the tire equipment is Michelin on dismountable rims of the same make. Throughout the 250-mile swing-round the endless turns of the 10-mile circuit, Strang never lost a moment through mechanical trouble, while the goddess of tire fates was equally amiable, his only Michelin mishap being a puncture on which he finished as fast as if all four were still good.

Berliet No. 8, which sprung the surprise of the day by finishing second, after having had endless tire trouble, was the only representative of the six-cylinder type entered. Its six cylinders are cast in pairs and measure 4 3-4 by 5 inches, giving it a rating of 60-horsepower, which is conservative, to judge from its speed

The Buick, Which Met with Disqualification.

The Butler Ames Trophy and Its Donor.

abilities. It was one of the two longest cars in the contest, and its wheelbase of 126 inches proved an advantage, rather than a hindrance, in taking the numerous turns. A carbureter of special American Locomotive design takes care of this essential, while lubrication is by means of a constant circulating system. Fuel feed is by pressure, ignition by Bosch high-tension magneto, a honeycomb radiator and centrifugal pump providing for the cooling. A four-speed selectively operated gear set and side chains complete the transmission. Diamonds on Continental dismountable rims form the tire equipment.

Knox team, Nos. 6 and 7, were extremely businesslike, the smaller showing its mettle by finishing third. No. 6 was the small Knox, having a four-cylinder engine measuring 4 7-8 by 4 3-4 inches and rated at 40-horsepower, its wheelbase of 102 inches making it the smallest car entered. The motor is of the new water-cooled valves-in-the-head type of Knox for 1909, and is lubricated by a special oil circulating system. A Splitdorf magneto, supplemented by a set of accumulators and four unit Splitdorf coil provided for the ignition. The tire equipment consisted of Fisk on the Fisk dismountable rims. With the exception of its difference in size and its side chain drive, the same description applies to a great extent to the No. 7 Knox, the motor dimensions of which are 5 1-2 by 5 1-2 inches, while its rating is 60-horsepower. Its wheelbase is 106 inches and it also had Fisk tire equipment. Both were fitted with special shock absorbers.

Simplex No. 1, which was a sure second up to within two or three of the short laps of the finish, when, according to report, it cracked a cylinder and had to retire, is a 50-horsepower four-cylinder machine which distinguished itself at the Briarcliff last Spring. Its cylinder dimensions are 5 3-4 inches "square" and its motor turns over at a rate, which, with the car's high gear ratio, made it pass the stand on the boulevard straightaway at a pace that made Lescault an equal favorite with Strang from the spectacular point of view. It was one of the lo competing, its wheelbase of 126 inches being the sa Berliet and exceeding the closest approach to this by foot, and, like most the others, its semi-elliptic springs fully wrapped. In addition to this, it was equipped v fault-Hartford shock absorbers. Drive is through a selective sliding gear set to double chains. Its tire consisted of Michelins on Michelin dismountable rims.

Of the seven contestants which lined up this mo No. 2 **Fiat** is the only one having low-tension ignitio magneto being used. It is a 60-horsepower, four-cy chine, its dimensions being 140 by 135 millimeters, ar Isotta, having a bore exceeding the length of its str accounts for its speed of 1,400 to 1,500 r.p.m. C expectation, its performance was a disappointment first, and its motor troubles, apparent early in the ra more pronounced toward the end, when it seemed to on three cylinders only. Like both the Simplex and transmission consists of a four-speed selective gear chain drive. It was equipped with Continental tire Continental ready-inflated replacements.

The performance of the little **Buick** No. 4 proved surprise. With its 4 5-8 by 5 inch four-cylinder m at 40-horsepower, it maintained a speed and regulari ning that was amazing. For ignition, a Remy magnet ployed, supplemented by a set of Duro accumulators necticut coils. It was geared at 2 1-2 to 1 and was two shaft-driven cars in the race. Before the latte over, however, it showed signs of giving way under Its radiator bearing No. 4 was replaced by a new one were signs of rear axle trouble which gradually bec and eventually prevented a successful termination of a most creditable showing. However, it was disqual referee for receiving assistance on the twelfth lap.

Fiat "60," Which Finished in Fourth Place.

Four Notables—Owen, Wagner, Fortescue, Spe

WILDWOOD HAS GOOD SPORT WITH ELEVENTH-HOUR FIELD

WILDWOOD-BY-THE-SEA, N. J., Sept. 7.—Steam triumphed over gasoline in the three principal events of the closing meet of the Motor Club of Wildwood over the mile course on the Central avenue boulevard, the Stanley steamer driven by D. Walter Harper flashing over the tape by a comfortable margin in each instance. But the field was not a representative one by any means, from the gasoline standpoint, the Parkin and the Sharp-Arrow, both comparative newcomers in the racing field, being the only cars to approach the steamer's time.

Indeed, there was a woeful dearth of cars of all kinds. So scarce were they, indeed, that the committee in charge had not a sufficient number of entries this morning to warrant the publication of a program, and had it not been for a number of Philadelphia visitors who post-entried their cars, it is quite likely that there would have been no races. Arthur Hammerstein, a relative of the celebrated impresario, entered his Mercedes as a stop-gap; John Wilkinson did likewise with his Packard, and young John Wanamaker, Jr., with a car of similar make. And they entered almost every event, too; otherwise the entire program would have been a series of triangular duels between the Stanley, Parkin, and Sharp-Arrow cars, the only ones that were stripped for the fray.

W. Wayne Davis, the starter, helped out the program by putting in a special match race of Mathesons, and the Stanley contingent did likewise with a trio of steam runabouts belonging to visitors.

And yet the sport was well worth while. The course was never in better shape, the weather was excellent, and the crowd enormous. After the Stanley had annexed the flying start free-for-all, the committee repeated with a standing start with the same field—that helped some, too.

The real battle of the day came in the mile time trials, the winner of which annexed the choicest bit of plunder ever hung up in these parts—a building lot worth $1,000 at Wildwood Crest. Hammerstein and his Mercedes led off with a modest 1:06 3-5, and then Harper cinched things with a :47 2-5 trip (course record, :42 3-5, held by Schill's 120-horsepower Fiat). That was fast enough to hold the others safe, for the Sharp-Arrow could do no better than :51 1-5, the Parkin :51 3-5, and the Wilkinson Packard :57 2-5.

It was the same story in the kilometer time trials. The Mercedes again led off—time :41 flat. Frank Yerger drove his "army dispatch" Studebaker over the distance in :41 2-5. Then Harper again choked off all opposition with a Stanley trip in :29 1-5, although Joe Parkin came near his time with a dash in an even half minute.

One of the most exciting races of the day was a handicap for touring cars, the marks being calculated from the performances of the cars in the previous events—a special ruling calling for the disqualification of any car that did the mile more than five seconds faster than its previous best time. Arthur Hammerstein's Mercedes was the long-mark car, and the 19 seconds' start proved too much for the Stanley (scratch) to overcome, the steamer finishing a bad third.

The prizes were distributed on the boardwalk by the Mayor in the evening, and what looked like a rank fiasco early in the morning was voted a good day's sport by the spectators. The summary:

MATCH RACE, MATHESON TOURING CARS.

1.	Matheson	Willie Houpt	1:22
2.	Matheson	Frank Yerger	1:27
3.	Matheson	Louis Taubel	....

FREE-FOR-ALL (Flying Start).

1.	Stanley	D. Walter Harper	:55 2-5
2.	Parkin	Joe Parkin, Jr.	:58
3.	Sharp-Arrow	Wm. Sharp	:59
4.	Packard	John Wilkinson	....
5.	Studebaker	Frank Yerger	....
6.	Mercedes	Arthur Hammerstein	....

FREE-FOR-ALL (Standing Start).

1.	Sharp-Arrow	Wm. Sharp	1:04
2.	Parkin	Joe Parkin, Jr.	1:04 3-5
3.	Studebaker	Frank Yerger	....
4.	Mercedes	Arthur Hammerstein	....

MATCH RACE, STANLEY RUNABOUTS.

1.	Stanley	Frank Dorrell	1:25 2-5
2.	Stanley	D. H. Clayton	1:27 2-5
3.	Stanley	Wm. Lippman	....

SPECIAL MATCH RACE, TOURING CARS (Owners Driving).

1.	Packard	John Wanamaker, Jr.	1:03 3-5
2.	Pierce-Arrow	John J. Coyle	1:19
3.	Peerless	Arthur Hammerstein	....

GASOLINE STOCK TOURING CARS, ANY PRICE AND POWER (Handicap).

1.	Mercedes	(19 sec.)	Arthur Hammerstein	1:18
2.	Parkin	(4 sec.)	Joe Parkin, Jr.	1:21 1-5
3.	Stanley	(scratch.)	D. Walter Harper	....
4.	Sharp-Arrow	(4 sec.)	Wm. Sharp	....
5.	Studebaker	(18 sec.)	Frank Yerger	....
6.	Packard	(10 sec.)	John Wilkinson	....

MILE TIME TRIALS (For $1,000 Lot.)

1.	Stanley	D. Walter Harper	:47 2-5
2.	Sharp-Arrow	Wm. Sharp	:51 1-5
3.	Parkin	Joe Parkin, Jr.	:51 3-5
4.	Packard	John Wilkinson	:57 2-5
5.	Studebaker	Frank Yerger	1:05 3-5
6.	Mercedes	Arthur Hammerstein	1:06 3-5

KILOMETER TIME TRIALS.

1.	Stanley	D. Walter Harper	:29 1-5
2.	Parkin	Joe Parkin, Jr.	:30
3.	Mercedes	Arthur Hammerstein	:41
4.	Studebaker	Frank Yerger	:41 1-5

TRACY FINDS PARKWAY GOOD FOR 90 MILES AN HOUR

THAT the cement stretch now in course of construction as a part of the Vanderbilt Cup race course has speed capabilities of 90 miles an hour was convincingly proved by Joseph Tracy in a series of sprints over it last Friday. The car used for the test was the Locomobile in which Mr. Tracy made the fastest lap in the Vanderbilt contest in 1906. Timed by Charles J. Dieges and H. O. von Schuckman, recognized sprint clocking experts, half-miles were negotiated in 23 and 24 seconds and quarter-miles in 11 and 10 4-5 seconds. The latter shows a rate of approximately 90 miles an hour.

Mr. Tracy was enthusiastic over the cement section of the course, 8 miles of the total 11 miles which have practically been completed. He thinks the curves well banked and capable of negotiation at a mile a minute, though the engineers have calculated only upon 40 miles an hour.

As a racing veteran, Mr. Tracy's opinion of the new speed stretch is valuable. He also had some interesting comments to make. "The cement highway makes an excellent racing road," said he, because it is absolutely dustless, and on account of the grayish color it does not blind the drivers even in the glaring sun, and is very easy to follow even at top speed. There are new sensations also in driving over the cement highway which one does not meet on the ordinary State or country road. There is quite as much bouncing and swaying of the car as you find on the dirt road—possibly a little more—but there is not the slightest tendency to skid, even on the turns, which are only banked, the engineers tell me, for a speed of 40 miles an hour. I took several of those turns which have been completed at the rate of 60 miles an hour, and found the banking ample. Over the straight stretches I think I broke my best record in the last Vanderbilt race. That was about 106 miles an hour for a quarter of a mile stretch, which we measured off near our racing headquarters at Lakeville."

It is not improbable that Mr. Tracy will drive in the Vanderbilt.

LATEST NEWS ABOUT RACE FOR THE VANDERBILT C

PRESENT indications are that the 1908 Vanderbilt Cup race, scheduled for October 24, on Long Island, will have a preponderance of American participants, with the foreign element secondary in importance. The latest information available indicates that a considerable number of American makers will make entries in the near future, while others may hold back until the actual closing of the list on October 1.

William K. Vanderbilt, Jr., donor of the famous cup, returned from Europe on Tuesday last, following which there were several conferences and a meeting of the cup commission yesterday afternoon. The whole situation was carefully canvassed, and there is no question about the holding of the race, providing the American manufacturers immediately come forward with the requisite number of entries—a situation which seems to be assured beyond question.

One Thomas racing car was entered this week, and it is anticipated that a second Thomas car will also be named very shortly. Locomobile, Pennsylvania, Roebling, Pope-Hartford, Frayer-Miller and Chalmers-Detroit are among the other probable sources of early candidates. Outside of a couple of firms, it is an admitted fact that the foreign makers have lost interest in American racing, coincident with the fact that the American market is no longer a remunerative one, except for a couple of makes.

Since the first announcement of the Vanderbilt Cup course there has been a notcworthy change in the course. At the western cnd the cars will turn off from the Jericho road into the Old Westbury road, and travel south in the direction of the cement stretch until they reach the old country road. To connect the latter with the cement stretch the parkway engineers are building a new highway of over a mile in lengh to connect the western end of the cement with the southern e Old Westbury road, thus doing away with two sharp climinating Whaleneck avenue.

The engineers have complained that so many aut are visiting the parkway as to interfere with the work ingly Chairman Thompson has found it necessary t order against the use of the parkway stretches by vis the work is nearer to completion.

Work on the Vanderbilt stretch of the parkway nearing completion. About eight miles of the cemen in all has been laid, and nearly all of the bridges at i county roads and railroads are ready for the cemen These bridges are formed by a solid cement abut enough to permit a steam train or a load of loose h under the new cement parkway. The tops of the abu connected by heavy steel girders, such as are used to s roof of the Manhattan subway, and around these wooden mold is built and the cement and crushed poured in until the desired level is reached, thus n bridges at all intersecting roads practically solid cen and stone. The longest bridge is 90 feet. This is th Central Park, where the highway begins to rise abo before it reaches the Long Island Railroad tracks. ments are about 35 feet high at this point, and the will pass over railway trains and vehicles which trave public highway, so that it will be possible while the progress to run trains on this branch on regular sch none of the country traffic will be interrupted in the le

The Long Island Railroad has made preparation tracks from the Hempstead branch into the back of stand to insure convenient service.

DE PALMA NOW HOLDS MILE TRACK RECORD.

MINNEAPOLIS, MINN., Sept. 5.—Walter Christie's world's record of 52 seconds, for a circular track, was lowered a full second to-day, in the speed trials run in connection with the Minnesota State Fair automobile races. Ralph De Palma, driving his Fiat car, put the mark at 51 seconds, and in subsequent attempts to equal the new record, Christie did 52 1-4.

De Palma's performance was so sensational as to arouse the 30,000 spectators who filled the grandstands, bleachers, and paddock, to the highest pitch of enthusiasm. Christie had made the first trial at the record, hitting a mark of 52 1-2, and making a daring circuit of the track. De Palma followed him almost immediately, and the performance of the young driver of Cedrino's 90-horsepower speed car was the acme of daring.

He took the turns with almost no lessening of speed, and did not skid as much as Christie had done. De Palma's burst of speed in the home stretch was hair-raising. His time at the half was 26 flat, and he reduced this by a full second in negotiating the last half of the course. The announcement of the setting of a new record brought forth thundering cheers from the spectators, and Christie was among the first to congratulate the winner.

Christie later made another trial at the record, making a circuit of the track in 52 1-4 seconds. In a match race held after the speed trials, De Palma took two successive heats from Christie, his time being 3:04 and 3:01 4-5.

CLEVELAND RELIABILITY IN NOVEMBER.

CLEVELAND, Sept. 8.—Because of a conflict with the Chicago contest dates, the Cleveland reliability run has been postponed from October 7-9 to October 14-16, with a possibility that it may not be held until the very early part of November.

NAZZARO WINS BOLOGNA RACE WITH

BOLOGNA, Sept. 6.—The race for the florio trophy was won by Nazzaro and his Fiat, in the time of minutes 21 seconds for the 327.6 miles. This is at 74.3 miles an hour, and is a world's record. Only six seventeen starters finished, in the following order:

Nazzaro, Fiat, Italian.....
Trucco, De Dietrich, French.....
Cagno, Itala, Italian.....
Demogeot, Mors, French.....
Lancia, Fiat, Italian.....
Garcet, Clement, French.....

There were six Italian and eleven French cars in t these, 50 per cent. of the Italians and 27 per cent. of cars finished. Mishaps were numerous, but no seriou occurred. After the finish Nazzaro declared that thi his last race, as he is soon to marry a young lady of T A. C. A. has for some time advertised that Nazzaro w in the Grand Prize race at Savannah, but it looks as if due to be disappointed.

QUAKERITES HOPE FOR FAIRMOUNT

PHILADELPHIA, Sept. 7.—The managers of the pro mile stock car race, which they hope to make a featu month's Founder's Week celebration, will not hear defi next Thursday whether or not the use of thc alread ten-mile course in Fairmount Park will be granted t ertheless, they are going ahead with many of the pr just as if the desired permission was a matter of co delay has been due to the fact that a majority of the has been out of town, and that a quorum will be a bility until Thursday next, when the appeal of the Q Motor Club will come up for action.

SUGGESTIONS FOR THE MAN WHO DRIVES HIS CAR

By THOS. J. FAY, E. E., President Society of Automobile Engineers.

FROM the time a car is delivered (in good working order) into the hands of the purchaser, it is for him to cope with the difficulties that may arise. The extent of his success will depend upon:

(*a*) The quality of the car.
(*b*) The skill of the user.
(*c*) The extent of service.
(*d*) The roads traversed.

At all events, the user of a car will oftentimes find himself unable to quickly locate troubles, unless he follows some systematic course, along lines based on "the elimination of the known quantities."

The scheme here given takes into account the various cases likely to arise distinguishing between the "likely known quantities" and the conditions to be surmised, in view of them. No plan can be so complete as to leave nothing to be desired; but this has been devised in a manner general in its scope, and should prove adaptable to nearly all makes of cars.

It is not to be supposed that any one car will develop any considerable number of the troubles suggested. Some of them, however, might arise in connection with any car; and with so many possible troubles, it will prove difficult for the average autoist to quickly locate the trouble to be eradicated, especially under road conditions.

The remedies will, in most cases, suggest themselves. For the more difficult problems, reference must be had to chapters dealing with them. It would detract from the value of this scheme to add anything by way of advice or suggestions of procedure.

CASE NO. 1—THE MOTOR WILL NOT OPERATE.

Known Quantities.

(*a*) Ignition is in working order.
(*b*) Compression is normal.
(*c*) Carbureter is in normal condition.
(*d*) Exhaust valves seat properly.
(*e*) Inlet valves seat properly.
(*f*) Gasoline in the tank.
(*g*) No water in the gasoline.
(*h*) Gasoline supply valves open.
(*i*) Gasoline piping is clear.
(*j*) Mixture intake is tight.
(*k*) Carbureter control system is not deranged.
(*l*) Gasoline "tank pressure" is normal.
(*m*) No water in cylinders (due to defective casting).
(*n*) Cylinders not flooded with cylinder oil.
(*o*) Cylinders not flooded with gasoline.
(*p*) Timer is not loose on the shaft.

Unknown Quantities.

(*a*) Ignition is out of time. This is a condition that could not well obtain in a motor that had been performing in a satisfactory manner, up to the time of failure to operate, unless the gear driving the timer should shift enough to alter the timing. That is, assuming the timer itself is in good working order. It is possible that the brushes of the timer might be loosened in such a way as to alter the timing relation.

(*b*) The spark might show all the evidences of working, and not work under compression. This could follow a crack in the insulation (porcelain tube) so small as not to be noticed. It might also be due to an excessive spark gap; it must be remembered that a spark in the open air is not positive proof of a spark under compression in the cylinder of a motor. The higher the compression, the higher the resistance of the spark gap.

(*c*) If the car comes from the repair shop and fails to work satisfactorily, provided all the known quantities of Case No. 1 are as stated, it may be taken for granted that the timing gears were not put back with the teeth meshing in the manner to set the timer in the right relation for timing the spark. In such a case, it will be necessary to locate the teeth that should mesh for correct timing and shift the gear relative to the pinion in such a way as to correct the error.

(*d*) It is possible to experience trouble as a result of infected grease in the timer. Anything that would materially lower the resistance of the grease, as particles of metal, carbon or other conducting media, would tend to cause trouble.

(*e*) If the wiring is in bad shape, it will be possible to note a spark in the open air that might be very feeble or intermittent under compression, since it might be the case that the leakage across the wiring system would manifest itself with the compression and not show up with the spark gap in air.

(*f*) Carbureter troubles may be distinguished from ignition troubles by making an artificial mixture in the cylinders. Crank with the vents open until enough fresh air has been passed through the cylinders to assure complete scavenging; then by priming through the vents and turning the engine over with the ignition switched on, it will be possible to note if the spark and timing are truly in working order. If the cylinders fire with the priming, the carbureter wants adjusting in some way or other.

(*g*) If a car has been working, and after repairing, fails to work in the usual manner, assuming all the known quantities are as before stated, and the timer is in the correct relation and in good working order, it is probable that the camshaft has been put back with the teeth of the half time gears out of correct mesh. This will demand that the half-time gears be remeshed, in accord with the requirements.

(*h*) If a car has been working, and after repairs it fails to come up to the mark, then, provided the timer is properly related and the half time gears of the camshaft show that they are right, as regards meshing, it will be well to note if the cams are keyed on; if they are, and in the act of repairing one or more of them were put back wrong, the result would be undesirable.

(*i*) If a motor has been provided with a new camshaft, and the known conditions are all as before stated, failure to perform properly will denote that the key-way for the half time gear is not in the right place with respect to the markings on the gear; that is, if the gears show markings for the correct mesh and the same markings were held to in inserting the new camshaft.

CASE NO. 2—THE MOTOR WILL NOT OPERATE.

Known Quantities (involving the carbureter).

(*b*) Compression is normal.
(*a*) Ignition in working order.
(*c*) Exhaust valves seat properly.
(*d*) Inlet valves seat properly.
(*e*) Gasoline in tank.
(*f*) No water in gasoline.
(*g*) Gasoline supply valves open.
(*h*) Gasoline piping clear.
(*i*) Mixture intake tight.
(*j*) Carbureter control system is not deranged.
(*k*) Gasoline tank pressure is normal.
(*l*) No water in cylinders.
(*m*) Cylinders free of excess lubricating oil.
(*n*) Cylinders free of excess gasoline.
(o) Camshaft not changed in any way.
(*p*) Camshaft half time gears not changed in any way.
(*q*) Grease in timer not infected.
(*r*) Motor will start after scavenging and priming.

Unknown Quantities.

(*a*) Carbureter float punctured? (if of copper).
(*b*) Carbureter float "loggy"? (if of cork).
(*c*) Gasoline level too low?
(*d*) Gasoline level too high?
(*e*) Float-bowl valve leaking?
(*f*) Nozzle stopped up?
(*g*) Nozzle needle valve worn?
(*h*) Nozzle needle valve wants adjusting?
(*i*) Gasoline strainer clogged?
(*j*) Balance levers of float loose or stuck?
(*k*) Carbureter passageways clogged?
(*l*) Air valves out of adjustment?
(*m*) Valve springs weakened?
(*n*) Lost motion in valves?
(*o*) Valves not free?
(*p*) Leaky gasket at carbureter joint?
(*q*) Change in specific gravity of gasoline?
(*r*) Water in float-bowl?
(*s*) Air vent stopped up? (float-bowl).
(*t*) Float guide pin damaged?
(*u*) Gasoline pocket in the intake?
(*v*) Hole in nozzle too small?
(*w*) Hole in nozzle too large?
(*x*) Defect in hot air piping?
(*y*) Initial air opening excessive?

CASE NO. 3—THE MOTOR WILL NOT OPERATE.

Known Quantities (involving the compression).

(*a*) Ignition in working order.
(*b*) Carbureter in normal condition.
(*c*) Gasoline supply adequate.
(*d*) Compression cocks closed.
(*e*) Motor cranks free.
(*f*) Motor starts with difficulty.
(*g*) Weak on the power stroke.
(*h*) Power falls off overmuch.

Unknown Quantities.

(*a*) Considerable falling off of compression?
(*b*) Leaky inlet valves?
(*c*) Leaky exhaust valves?
(*d*) Worn piston rings?
(*e*) Worn cylinders?
(*f*) Valve stems deformed?
(*g*) Valve stems in tight holes?
(*h*) Valve stems gummed up?
(*i*) Valve seats pitted?
(*j*) Valve springs' temper drawn?
(*k*) Valve lift adjustment changed?
(*l*) Crack in cylinder?
(*m*) Piston rings broken?
(*n*) Piston rings in tight slots?
(*o*) Piston ring slots all in line?
(*p*) Cylinder head covers not tight?
(*q*) Crack in piston?
(*r*) Spark plugs not screwed in tight?
(*s*) Intake stopped up?
(*t*) Broken valve stem?

CASE NO. 4—MOTOR WILL NOT OPERATE.

Known Quantities (involving the ignition).

(*a*) Compression is normal.
(*b*) Carbureter in normal condition.
(*c*) Battery in good order.
(*d*) Wiring free from trouble (battery).
(*e*) Timer in good order.
(*f*) No spark at trembler.

Unknown Quantities (involving the ignition).

(*a*) Trembler contacts worn?
(*b*) Trembler contacts not stuck?
(*c*) Trembler not adjusted properly?
(*d*) Leak in primary wiring?
(*e*) Primary wiring open circuited?
(*f*) Primary coil short circuited?
(*g*) Primary electrodes partially short circuited?

CASE NO. 5—MOTOR WILL NOT OPERAT

Known Quantities (involving the ignition).

(*a*) Compression is normal.
(*b*) Carbureter in normal condition.
(*c*) Spark at the trembler.
(*d*) Battery in good order.
(*e*) Timer in good order.
(*f*) Primary wiring in good order.
(*g*) No ignition.

Unknown Quantities (involving the ignition).

(*a*) Secondary wiring short circuited?
(*b*) Secondary wiring open circuited?
(*c*) Spark plug short circuited?
(*d*) Spark gap excessive?
(*e*) Secondary coil open?
(*f*) Secondary coil short circuited?
(*g*) Ground contact not good?
(*h*) Trembler sluggish?
(*i*) Trembler screw loose?

CASE NO. 6—MOTOR WILL NOT OPERAT

Known Quantities (involving the battery).

(*a*) Compression is normal.
(*b*) Carbureter in normal state.
(*c*) Timer in good order.
(*d*) Wiring in good order.
(*e*) Ground contact of wiring good.
(*f*) No spark at the spark plug.
(*g*) No spark at the trembler.
(*h*) No spark at the timer.
(*i*) No spark across the battery (storage) termi
(*j*) Very old or much used dry battery.

Unknown Quantities (involving the battery).

(*a*) Battery dead?
(*b*) Storage battery sulphated?
(*c*) Storage battery fully discharged?
(*d*) Storage battery "mud" in cells?
(*e*) Storage battery short circuited?
(*f*) Storage battery active material fallen out?
(*g*) Storage battery very cold?
(*h*) Storage battery electrolyte evaporated?
(*i*) Storage battery electrolyte weak?
(*j*) Storage battery electrolyte strong?
(*k*) Storage battery jar broken?
(*l*) Dry cells dried out?
(*m*) Dry cells, zinc eaten away?
(*n*) Dry cells, chemical dissipated (transformed)?
(*o*) Dry cells, contact with terminals not good?
(*p*) Primary batteries, run down?
(*q*) Primary batteries, "polarized"?
(*r*) Primary batteries, elements eaten away?
(*s*) Primary batteries, solution neutralized?
(*t*) Primary batteries, solution evaporated?
(*u*) Primary batteries, jar broken?
(*v*) Primary batteries, inter-cell leakage?
(*w*) All batteries, local action?
(*x*) All batteries, impurities?
(*y*) Too small for the work?
(*z*) Not enough cells in series (or too many in

[*To be Continued.*]

Farms in Texas which formerly, in spite of their were practically worthless on account of their distan a market, are now being profitably cultivated by the an automobile.

A CHAPTER ON MAGNETO CONSTRUCTION

THOUGH the magneto has gradually won such an amount of confidence that the leading automobile manufacturers very generally rely on it alone to supply the indispensable spark, it is not without a slight regret that the automobilist has seen the suppression of the storage battery. It is not because the storage battery was frequently used for continuous running that it is regretted but because it allowed the engine to be started on compression and frequently saved laborious cranking in cold weather. European practice has been towards the abolition of the storage battery to such an extent that probably nine-tenths of the leading makers use magneto only.

Fig. 1.

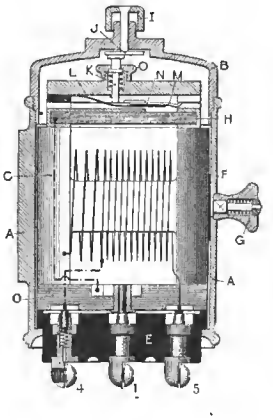


Fig. 2.

Fig. 1.—The Bosch Coil.—A, metal case containing coil; B, cover; G, commutator switch; I, starting switch; E, platinum plate-carrying contacts.

Fig. 2.—Sectional Drawing of the Bosch Coil.—A, metal case; B, cover; C, armature of the coil in form of double T; D, commutator plate attached to movable coil; E, fixed plate with contacts; G, commutator switch; H, condenser; I, starting switch; J, pin, with base of starting switch; K, platinum pin; L, spring with platinum contact; M, trembler (operating at moment of starting only); N, trembler spring; O, regulating screw; P, protective joint against dust and damp.

Thanks to the ingenuity of the Bosch experts, it is now possible to have the advantage of storage battery without the necessity for a complete double ignition system, the motor being started up from the seat—providing of course that a certain amount of fresh gas remains in the cylinders—by the simple operation of a switch causing a temporary working of the trembler. The new Bosch coil, as illustrated by Figs. 1 and 2, reproduced from *Omnia*, is contained in a cylindrical metal box of only about one-third the size of the usual trembler coil. It comprises the starting apparatus with trembler, a condenser, the coil proper, a commutator, allowing the passage at will from magneto to storage battery.

The metal case *A*, covered by the cap *B*, contains the soft iron core *C* in the form of a double *T* armature, this arrangement allowing of a coil of high efficiency while at the same time of small space and low weight. The winding, says *Omnia*, is identical with that of a Bosch high-tension magneto, the primary consisting of a small number of turns of heavy wire, and the secondary of a large number of turns of fine wire. The starting point of the primary winding is fixed to the core *C* and is thus electrically connected to the case *A*. The end of this winding is connected to the beginning of the secondary winding which forms its direct continuation. A wire connects the united ends of the two windings to one of the connections of the commutator placed in the lower part of the case. This connection should be joined up to the storage battery by a cable. The secondary winding also ends at one of the commutator connections which is linked up with the magneto distributor when ignition is made by storage battery.

The commutator is placed directly under the coil, so that its movable part *D* is attached to the armature core while its fixed part *E* constitutes the base of the box and receives the connections of the exterior wires on its lower face. The connections between the poles and the conducting parts of the rotary plate *E* are assured by four elastic contacts 2, 3, 4, 5, arranged in a circle, and a central contact *s* carrying a fixed pin.

The commutator is operated by means of a switch moving in an opening provided for it in the walls of the case. Starting from the intermediate position, which is zero, ignition would be

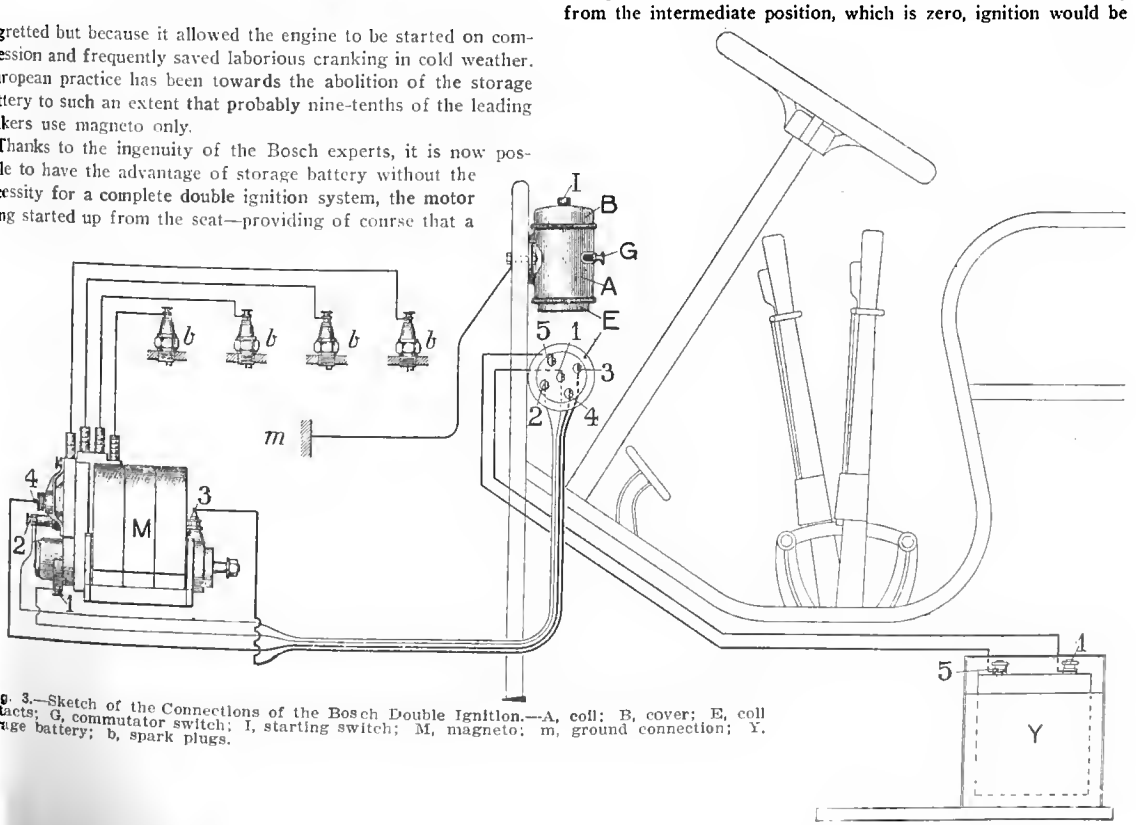


Fig. 3.—Sketch of the Connections of the Bosch Double Ignition.—A, coil; B, cover; E, coil contacts; G, commutator switch; I, starting switch; M, magneto; m, ground connection; Y, storage battery; b, spark plugs.

by magneto if the switch were pushed to the left; it would be by storage battery if it were moved to the right. There is a slot in the case for each of the three positions, the switch *G* being maintained there by means of a spring. To make a change of position it has first to be drawn outwards.

The condenser *H* is placed directly above the armature of the coil. One of its poles is given a ground connection, while the other is joined up to the central contact of the commutator. As one of the poles of the accumulator and the isolated contact of the magneto igniter are connected to the central contact the condenser is thus in parallel with the igniter.

All the parts just described come into operation when ignition is made continuously by storage battery; the apparatus working without the use of the trembler, the inherent defects of this organ are completely abolished and a reliable ignition is obtained. On the contrary, when the motor is started from the seat the trembler is momentarily put into operation to obtain the first sparks. This is necessary owing to the fact that the compression in the cylinders is never more than about half the maximum value, and the first spark is not certain to produce an e Once the motor has been started, however, the tremble out of operation.

At the center of the cover of the case is a starting s with a base *J*, against which a platinum pin *K* is pre means of a spring. On pressing down the switch *I* the driven down until it touches the platinum contact *L*. Th bler *M*, pushed upwards by the spring *N*, then comm vibrate.

The circuit is formed by the ground connection of the pin *K*, the spring *L*, the commutator, the storage batt primary winding, and is closed by the ground connectio coil. The current is broken when the trembler, drawn wards, strikes the spring *L*, for the contact between th and the pin is suppressed.

Four of the current models of Bosch magnetos, constru double ignition, can be modified by the changing of a f for this new device. Four other models can also be cha the new double ignition with very little trouble.

A NEW COMBINATION TIRE FOR HEAVY DUTY

IN the maintenance of heavy trucks tire cost is one of the most important items, and many attempts have been made to produce a tire which would utilize the cushioning action of rubber and take the wear on a harder and less expensive substance. The latest type of combination tire to be put on the market is the invention of E. S. Lea, of Trenton, N. J. The tire is applied to specially made wheels, which have the hub, spokes and rim all in one casting. Around the outer circumference are twelve deep recesses, each of which contains a cast steel shoe fitting in a thick rubber bed. The shoes nowhere come in contact with the rim, but have the cushioning action of the rubber on all sides. At the same time the entire wear is on the face of the shoes. The first wheels of this type, which were in use last winter in ice, mud and snow, had their shoes corrugated, but after the corrugations were entirely worn off it was found that the tread tion was as good as ever. They will therefore be left in the future. Each shoe is held on by two bolts wh through the rubber bed and the rim; these bolts have washers so as to allow a certain amount of play in eve

Cross-section Lea Wheel Showing Tire Bolt Attachment.

View of Lea Wheel and Sections of the Tire.

tion, giving the shoes perfect freedom of movement to t of any inequality in the road surface. Another comm point is that these tires can be replaced at about one-thir cost of ordinary solid rubber tires.

BOSTON ACQUIRED THE TAXICAB HABIT VERY QUICKL

BOSTON, Sept. 1.—Another new taximeter cab company has just begun business in Boston, making four which are in operation. The latest addition is the Taxi-Service Company, of which A. E. Morrison of the Morrison-Price Company is general manager. Its offices are in the Hotel Lenox, and the company has secured stands at the railroad stations and at some hotels, though as yet its equipment is not sufficient to take up these options. The Taxi-Service Company used American Locomotive cabs and it already has five in service, keeping them when not in use at a garage on Huntington avenue.

Still another taximeter cab service has been started v White steam cabs, said to be the first of the White Co output of this kind of vehicle. The cabs have the smal of White engine and landaulet bodies. They are operat the White garage on Newbury street. A third concern h business in a small way with an Elmore and an Atlas

The Taxi-Motor Cab Company, the first concern to a regular taximeter cab service in Boston with Thom is meeting with good success and its first allotment of five cabs is kept constantly busy.

LETTERS INTERESTING AND INSTRUCTIVE

THREE-POINT SUSPENSION AND GRADES.

Editor THE AUTOMOBILE:

[1,531.]—I note that several first-class cars use the three-point suspension and the unit power plant, but that this practice is not uniform. I should like to have you show how the motor can be suspended from four points of the frame without danger of having the alignment destroyed by road shocks and strains. I should also like your opinion of the unit power plant, and of the construction in which the change-gear is mounted on the rear axle.

On page 317 of your issue of August 27 you show a picture of an auto climbing what is claimed to be a 50 per cent. grade. If the grade shown is that steep, will you please explain how the percentege is reckoned? READER.

Cambridge, O.

The design of automobiles, like most other things, is a series of compromises. Three-point suspension and the unit power plant have many undeniable advantages, but they also have disadvantages which some designers appear to think more weighty. If one attempted to make a car in which every part was designed in the one and only correct way, the result would simply be a nightmare. The really good automobile is the one which, avoiding positive mistakes, embodies as many good features as will fit into a harmonious whole. The four-point suspension may easily be made rigid enough to withstand the strains due to road shocks.

In answer to the grade question, there is a pretty general impression that a 100 per cent. grade is straight up and down, 50 per cent. at an angle of 45 degrees from horizontal, and so on. In reality, the per cent. grade is simply the number of feet of rise to each hundred feet horizontally. Thus, a 100 per cent. grade is a rise of 100 feet in each 100 feet, 50 per cent. a rise of 50 feet in each 100. The per cent. grade, expressed decimally, is the tangent of the angle of elevation from the horizontal.

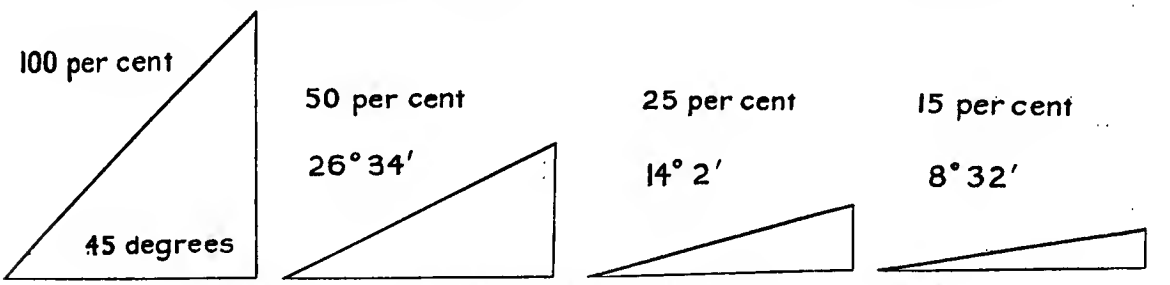


Diagram Illustrating the Various Percentages of Gradss and the Angles to Which They Correspond.

THE LOWEST SPEED OF AN AUTOMOBILE.

Editor THE AUTOMOBILE:

[1,532.]—We desire some authoritative information as to the lowest speed of an automobile. Can the average make of automobile, when necessary, run at a rate as low as ten miles an hour without injury to the machine? And would it in your opinion be under as good control at this speed as at a higher rate?

Suffolk, Va. J. M. BUTLER & SON.

Certainly an automobile can run at ten miles an hour without injury, and also be under just as good control. Any good machine ought to be able to run at five miles an hour indefinitely without the least trouble, and could run slower than that on the low gears, although if this were continued very long the engine would probably overheat. We do not see how the question ever arose, unless you were thinking of high-geared racing cars, which would probably overheat if run steadily at ten miles an hour. As to the ordinary touring car, however, there cannot be the least doubt of its ability to maintain this speed as long as desired, though there is no reason why it should ever be necessary to do so.

THE USE OF "DOPE" IN A GEAR SET.

Editor THE AUTOMOBILE:

[1,533.]—I have a light four-cylinder runabout and although it is new, only heen run a few months this season, I find that the planetary transmission makes what appears to be a great deal of unnecessary noise on the low speed, and more particularly on the reverse. I have been using oil in it as a lubricant and the local repairman informs me that a compound which he calls "dope," *i. e.*, a heavy mixture of oil and grease, would remedy the trouble. Not having any too much confidence in the repairman, I would like to have this from some higher authority before applying it. Will it do as recommended, and, what is more important, will it have any bad effect? W. T. LANSING.

Richmond, Va.

Given a large number of metal pinions running together and noise is inevitable; make these pinions small and revolve them at a high speed and the undesirable effect is increased. This is the case of the planetary gear-set on the small runabout of to-day. Its pinions are very small and they have to revolve at a very high speed, so that the elimination of the noise is impossible. Whether it is advisable to attempt to muffle it is another matter. Makers of such cars usually advise the use of a light oil in the gear-set on account of the small size of the pinions and their high turning speed, owing to the much greater resistance a heavy lubricant would impose on them. The use of "dope" will drown the noise to a very great extent, and as both the low speed and reverse gears are employed but little on such cars, it is a question whether it is better to put up with the noise during the comparatively short time in which its presence is unavoidable, or to fill the gear-case with a heavy lubricant, and put up with the loss in efficiency for the same reason, *i.e.*, that the working under such conditions only lasts but a short time. The use of "dope" for this purpose cannot do any harm that we can see and is not so apt to leak out of the case, as is the oil, so that where a driver perfers a slightly lesser efficient gear to an extremely noisy one, there appears to be no reason why he should not make use of such a lubricant.

BECAUSE COEFFICIENT OF FRICTION IS HIGHER.

Editor THE AUTOMOBILE:

[1,534.]—Can you tell me why it is necessary to use different metals in brakes? That is, why should the brake band, or shoe, have to be of a different metal than the drum upon which it acted? I have been puzzled more or lese over this, and as some makers go to considerable expense to provide a different metal, usually bronze, I have felt that there must be some good reason for it, but none of my friends have been able to enlighten me. BRAKES.

Pittsburg, Pa.

This is simply because when two pieces of the same kind of metal are rubbed together their coefficient of friction is not as high as when two similar metals are placed in contact and rubbed one over the other. In other words, the same kind of metal tends to slip upon itself more than a dissimilar piece would, such as bronze on cast iron or steel. For the same reason some makers do not rely upon different metals for this purpose, but

employ facings of special friction materials. Advantage is taken of this reduced coefficient of one metal upon itself in making pistons and cylinders of cast iron, as two pieces of cast iron will work better together than would any two pieces of dissimilar metal, that is, for this purpose, where the object is to reduce, and not to increase, the friction, as is the case where brakes are concerned.

WHAT TOLL FOR USE OF A PARKWAY?

Editor THE AUTOMOBILE:

[1,535.]—1. What rate per mile can the average automobilist afford to pay for the privilege of traveling over a comparatively straight and level macadamized road used only by automobiles, in preference to traveling over the ordinary country road?

2. Would a road built specially for automobilists along the route of an electric railway have a tendency to increase or decrease the amount of travel on the electric line? J. A. L.

Spokane, Wash.

It seems to us that you are putting the cart before the horse. A better way to go about the question would be to find the cost of constructing the road and figure the maintenance expense and the profits desired, and divide the total amount among the number of automobilists who could be expected to use it. As to how much the automobilist would be willing to pay rather than take to the public road, that depends so much on the individual pocketbook that it would be vain to attempt any generalizations.

We do not believe that the automobile road would affect the travel on the electric line in any way. People who own automobiles would probably use them in preference to the cars whether there was a special road or not. We will be pleased to print any other communications on this subject.

LEAKING OIL AND DECARBONIZERS.

Editor THE AUTOMOBILE:

[1,536.]—1. Our auto leaks considerable oil when standing in the garage and it has been our custom to save it. Is it possible to filter it so that it can be used again, and if so, how?

2. What possible harm can come from the use of the "decarbonizers" which one sees advertised so much? A SUBSCRIBER.

Attleboro, Mass.

The value of the oil as a lubricant depends on how long it has already been in use in the crankcase or gearcase. If you think it worth while, you could strain it through fine wire gauze. The best plan, however, would be to stop the leak, as there can be no excuse for the car's dripping oil at all. It may be that some of the drain cocks in the crankcase or gearcase are not completely closed; or else the leak may be through bearings which have become slightly worn or which are not provided with proper stuffing boxes. As the car probably loses as much oil on the road as it does in the garage, an hour's attention to the cause of the leak would prove to be good economy in the end.

The only way in which "decarbonizer" could damage the engine would be by corroding the cylinders or valves, through chemical action. We have had no personal experience with any of these compounds, but all the letters we have received concerning them seem very favorable.

EXCESSIVE CONSUMPTION OF FUEL.

Editor THE AUTOMOBILE:

[1,537.]—As a reader of "The Automobile" I wish to take advantage of the answer which I hope to receive in the next issue of this paper. I have a Pierce-Arrow car, 1906 model, 30 horsepower, in fine condition, everything perfect, and it consumes one gallon of gasoline to seven miles. When it was new I could go nine miles on a gallon. I know that my carbureter is perfect and everything else in the same condition. Can you kindly help me out with this matter and find out what other 1906 Pierce-Arrow cars do on one gallon of gasoline? BEN BOYD.

Bath Beach, N. Y.

Despite your assertion to the contrary, it looks as if there was something radically wrong with your carbureter. A car like yours should be able to cover at least fifteen miles to the gallon under ordinary conditions. Before taking ter up with the makers, however, there is another pc —a rather delicate one. Are you sure you get all the you pay for, and use all you get? A little investig those lines has cured more than one case of excess sumption, and that without recourse to the repair

INFORMATION WANTED ABOUT A SIX-C

Editor THE AUTOMOBILE:

[1,538.]—In one of the issues of THE AUTOMOBILE I six-cycle engine that was made and tried out in England to refer to this article and would like to have you let what number it was published in. I am quite certair shortly after the first of the year. R. S. PO

Minneapolis, Minn.

That six-cycle article certainly sounds familiar, and lieve that we published it sometime within the last least; but owing to the shortness of the article it was not in our files, and an exhaustive search has as yet failed it to light. We call the attention of our readers to th and hope some one of them will have a better memory t and will be able to help you out.

THE COAL-BURNING STEAMER ON THE R

Editor THE AUTOMOBILE:

[1,539.]—I enclose a photograph of my coal-burning st It works fine; the steel tires are a success and my drive a well without any differential. I burn either kerosene or

M. W. Hazelton's Coal-burning Steam Automobile

latter preferably, and can raise 100 pounds of steam f water in six minutes. This first car cost double what the made for in lots of a half-dozen at a time, as I got the pa six different States. I would like to correspond with parti ested in this car with a view of manufacturing it. The two-seated car, all of the best possible material, would \$700, and it will last longer than any \$2,000 car on the Tbe tires will last ten years. M. W. HAZE

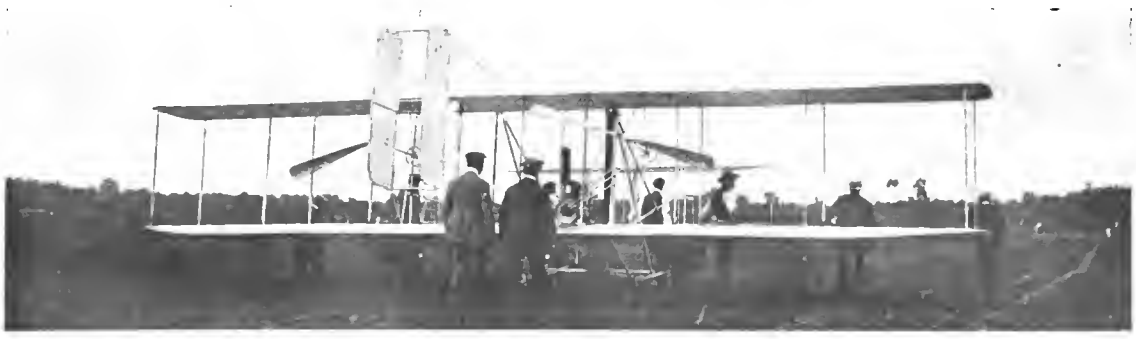
Oneonta, N. Y.

CONCERNING ONE MAKE OF CARBURET

Editor THE AUTOMOBILE:

[1,540.]—In reference to letter 1517, replying to the seco tion, beg to say that I have been using one of the Model carbureters on my Ford runabout all this year and w change it for any other. I first got it without the univer for the needle valve, but secured one later and now woul without it. I can always regulate the mixture accordin atmospheric conditions, and also according to the requi of the road, as for heavy pulling and hill climbing a richer mixture seems to help. I can drive at a high gear and have found it flexible for varying speeds. from my own experience, I feel sure that "Spark Gap" more than pleased with one, and I would certainly recomm ing it with the universal joint. W. S. HAG

Sharon Hill, Pa.



Wilbur Wright Making Preparations for One of His Many Successful Flights on the Old Fair Grounds at Le Mans, France.

WHAT THE BROTHERS WRIGHT ARE ACCOMPLISHING

WASHINGTON, D. C., Sept. 8.—Orville Wright, who is in charge of the Wright Brothers' aeroplane which was built under contract for the U. S. Army, arrived at the aeronautic testing grounds near here last week and at once began the work of tuning up his machine. He made his first flight Thursday evening. The aeroplane was launched by a falling weight after the now familiar Wright method, and rose slowly to a height of about twenty feet. Mr. Wright was noticeably nervous, and after being in the air for one minute and eleven seconds made a wrong movement with one of the levers, which brought the machine forcibly to the ground and broke one of the skids. Friday Mr. Wright tried again, after making the necessary repairs. This time he had the machine under perfect control and remained in the air four minutes and fifteen seconds, covering between two and two and one-half miles. He alighted gradually and without the least jar, and said afterwards that he came down merely because he did not want to attempt too much at once with a new machine.

On Labor Day Wright made one short flight of only 54 seconds, descending because of a defect in one of the steering levers. He has until September 28 to complete his official trials, and does not intend to take any unnecessary risks. He wishes to make several more preliminary flights to become better acquainted with the machine, so that the possibility of failure will be reduced to the minimum. In order not to crowd the time limit too closely, however, he will probably begin the official flights this week. It was learned to-day that Wright is preparing to go to Europe as soon as the Fort Myer tests are concluded. This is taken as confirmation of the report that a number of foreign governments are endeavoring to obtain Wright aeroplanes for military purposes.

How Auto Helped Aeronautically.

WASHINGTON, D. C., Sept. 1.—An automobile showed its innate superiority to Missouri mules as a tractor the other day when it was necessary to remove the Wright aeroplane from the Signal Corps balloon shed, at Fort Meyer, Va., to the balloon tent formerly occupied by the U. S. dirigible No. 1 on the aeronautic field. A 30-horsepower water-cooled Aerocar, driven by the owner, S. C. Crane, of Dayton, O., did the work in such a satisfactory manner that in spite of the rough spots of the road and a terrific grade, the aeroplane was delivered safely at its destination.

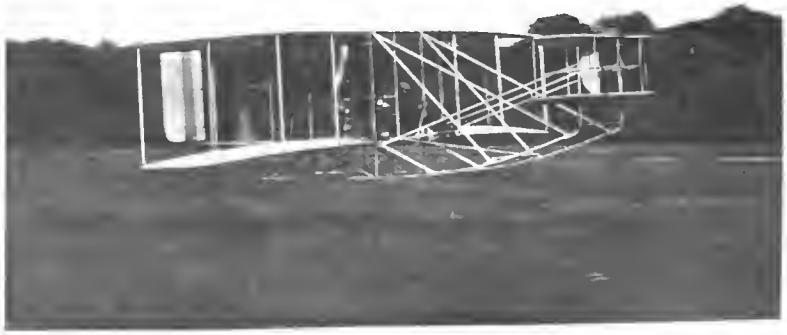
When the sky motor had been partially demounted in the afternoon it was placed upon a springless quartermaster's wagon with the length of the planes parallel with the length of the wagon. Then a pair of husky army mules were hitched to the end of the tongue. Mr. Crane, who is a friend of Mr. Wright, was near by with his car, and someone suggested that the automobile be used; but the mules started up the hill with their precious burden. The animals went at the job with jumps and starts, however, and Mr. Wright, usually calm and undisturbed, called excitedly to the muleteer to halt. When this had been accomplished it was but a few moments' work to hook on the Aerocar, so well adapted in name, at any rate, for the task.

With the low gears enmeshed the automobile started slowly without the slightest jerk taking up the slack, and towing the heavy army wagon with its strange freight up the rough road that led to the hill top. A squad of photographic sharpshooters ranged on the abutting hillside fired many a shot as the strange spectacle moved along.

Meeting a coach-and-four standing at the curb, Mr. Wright had the automobile stopped and got out to tell the grooms to move to some better place. He would not allow the machine to proceed until the owner of the four-in-hand had stated that the horses would not jump.

FLYING TO BE RENEWED AT ISSY.

PARIS, Sept. 3.—After turning the aeronauts out of the Issy-les-Moulineaux drill ground excepting for a paltry two hours at daybreak, the Minister of War has come to the decision that



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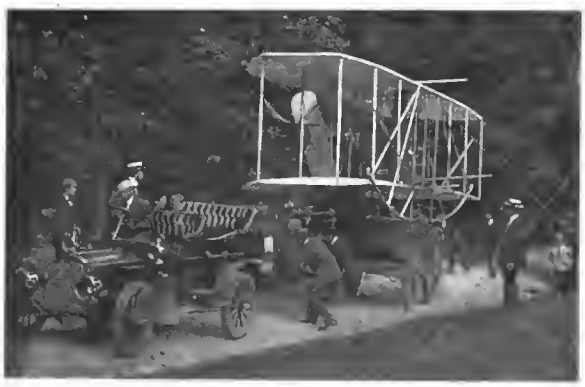
Orville Wright's Aeroplane in Flight at Ft. Myer, Va.



Aerocar Hauling Wright Aeroplane to Shed.

it would be better to encourage what will be, in more senses than one, a rising industry, and has sent forth a declaration, after consultation with Chief of Police Lepine, that all sky pilots can come back to the suburban plain and experiment from sunrise to sunset. The only restriction is that there must be no aeronautical flights when the ground is being used by the military; as the troops are only on the ground about two hours every morning, the loss is not great.

The Issy ground will be rigorously closed to the public, a force of soldiers and police always being on guard when flights are being attempted. Though prevented from wandering on the ground the public will not, however, be denied a view of the flying machines, the high, broad walls of the fortifications being ideal gallery seats free to all. It is further announced that Colonel Picquard has other schemes in preparation for the encouragement of aeronautical experiments.

There is no doubt that this change of attitude has largely been brought about by the presence of Wilbur Wright in France. The American's demonstrations at Le Mans have shown that France is not alone in the struggle to obtain the secret of flight. Leading personalities in the aeronautical world have pointed out this danger to the authorities, and in order that they should not be left behind in the race for supremacy, official aid bas been given.

Only a few days ago there was no indication whatever that the authorities would consent to allow the Issy ground to be used again except under annoying restrictions, and in view of this several aeronauts had made preparations to move further afield. The Antoinette Company has secured the island of Tournedos, in the Seine, between Les Andelys and Rouen, and would remove there their own and many of the machines built by them; Henry Farman immediately on his return from New York had fixed upon a plain at Verneuil, 20 miles out for further experiments; and Leon Delagrange was still of a private ground.

Entries for the aeronautical section of the Paris anni are sufficiently large to give assurance of a very valuab of modern flying machines. Several machines of the and Delagrange type are promised, and Esnault-Pelt show both aeroplanes and his special type of light-weig

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Baldwin Airship, Accepted by U. S. Government.

Wilbur Wright Remains at Le Mans.

Le Mans, Sept. 3.—Ill-luck attended Wilbur Wrigl first attempt at flight after an enforced idleness of ei Just when the start was about to be given one of the caught his arm in a wire operating the rear rudder, it considerably. Wilbur Wright declared that the matt no importance, and the order to start was consequen After a few seconds in the air, however, it was noticec pilot was not complete master of his machine. After o an attempt to descend was made, but instead of bei

Wilbur Wright in the Operator's Seat.

out with the usual gracefulness the machine refusec its helm, heeled over, then came to earth bruskly, bre of the skates. The broken part was repaired the same

Wilbur Wright declares that he will remain at Le M the contract with the French committee has been ful plished. He will then probably proceed to Berlin, to ma before the German army authorities. There is no trut clares, in the report that he is considering the crossi English Channel from Calais to Dover, such a journ present state of aeronautics being a foolhardy venture.

The special prize for a flight of not less than 82 feet will also be competed for at an early date, Wilbur W claring that he can get over the difficulty requiring the to start from the ground by its own power. He will ei on the catapault, descend until he skims the ground again for the height test, or start up direct from th without the use of any apparatus.

A dinner in honor of Wilbur Wright was given at du Dauphin, Le Mans, by M. and Madame Lazare Weiller those present being most of the French aeronauts ga Le Mans to view the flights, and Baron d'Etournelles de

NEXT GRAND PRIX NEAR CHATEAULAND.

PARIS, Sept. 3.—It is in the Anjou district, on the borderland of the famous chateau country, that the next Grand Prix will be held. No official decision has been arrived at, but Chairman René de Knyff, of the Racing Board, has expressed himself as convinced that this is the ideal course for 1909, and doubtless his colleagues will share his view at the next meeting of the board. The adoption of the course will be conditional on the raising of a subvention of $20,000, an amount that the Angieans believe they can get together.

The course, which is about 60 miles to the west of the town of Tours and in the valley of the Loire, was first proposed in 1906, its length then being about 70 miles. The town of Nantes, though some distance to the west of the proposed course, would profit by the race and decided to contribute one-third of the subvention demanded by the club. Since 1906, however, the Sporting Commission's opinion regarding the length of a course has changed, with the result that instead of 70 miles only 40 are required, a western portion has been left out and Nantes is no longer interested in the scheme. It thus devolves on Anjou and district to raise the necessary amount, which it will do by amounts contributed by the General Council, the Municipal Council and private individuals. Being in a district that annually attracts thousands of tourists, the benefit of the Grand Prix will be more widespread than is usual, with the result that all the towns along the Loire valley may be expected to contribute, and even Tours will not keep out of the movement. With such prospects of raising the subvention it is safe to declare that the 1909 Grand Prix be held at Anjou. The road surface is good throughout, the course being about as fast as at Dieppe.

ANOTHER FRENCH VOITURETTE RACE.

PARIS, Aug. 22.—There are prospects of good sport at the Voiturette race, to be held near Compiègne September 10 to 13, the present entries standing at thirteen, with the certainty of at least nine more being brought in before final closing. Those now on the lists comprise a Prod'homme, a Truffault, three Taine, three Lion-Peugeot, three Le Metais, and three Werner. The promised entries are full teams of Sizaire-Naudin, Aries, and Guillemin. Practically all the cars taking part in the Compiègne event ran in the voiturette Grand Prix at Dieppe, the drivers for the local event being in most cases the same as for the previous race. There are changes for the Werner team, the chief of which is now A. Autran, who was pilot with St. Chaffray on the De Dion New York-Paris car.

The task that the one lungers of 3.9 inches bore will have to accomplish is to race round a closed and somewhat hilly course for a total distance of rather more than 300 miles, all attention to the car after the start has been given being confined to driver and mechanic. Regulations differ slightly from those of the Voiturette Grand Prix in the bore limits allowed to two, three and four-cylinder engines, these having been carried to 80, 70 and 65 millimeters for each class. As the Grand Prix race showed, multiple cylinder engines with the previous bores were at a slight disadvantage. Two-cycle and the Gobron type of engines are admitted on the same footing as the four-cycle single piston motor.

CHATEAU THIERRY BECOMES HISTORY.

PARIS, Aug. 22.—After six consecutive years, Chateau Thierry has been abandoned as the scene of the annual autumnal hill climb. Last year a soldier on duty was killed by a motorcyclist in his endeavors to avoid an over-officious local fireman. A lawsuit followed, bad feeling sprung up between the municipality and the organizers of the competition, with the result that the district has been definitely abandoned. Though the value of the Chateau Thierry hill climb had gradually decreased as the automobile reached perfection, it still retained much of the importance which attached to one of the earliest automobile testing grounds in the neighborhood of Paris.

BRITISH TOURIST TROPHY RACE.

LONDON, Sept. 4.—The sole racing event promoted this year by the R. A. C. is to take place on September 24, the Isle of Man being, as usual, the scene of operations. The 38-mile course originally used for the Gordon Bennett eliminating trials has been reverted to in place of the shorter lap used in the previous T. T. races. Instead of the fuel limitation which has been the feature of these events, the cylinder bore is restricted this year, the maximum for a four-cylinder engine being four inches. Forty entries have been received, of which 22 are British and 18 foreign, no American car figuring in the latter section.

Dealing with the cars themselves, some extraordinary statements have been published, both with respect to the power of the engines and the speed attained in practice. The Humber Co. credibly state that their engine has developed over 70 B.H.P. on test. This engine has stroke of 6 inches compared with 4 1-2-inch stroke of the Calthorpe and the 6 1-2-inch of the Arrol Johnston.

In an event at the last Brooklands meeting, the Hutton car, which is entered for the coming race, was certified to average 83 miles an hour, and this fact lends some credence to the belief that the race will be extremely fast. Practicing has not yet commenced, for, owing to the crowded state of the island at present, competitors are not allowed to land their cars till September 3, and then they must not be on the road after 9 A. M.

The whole of the course has been treated with a dust-laying preparation to lessen risk of accident.

BRITISH ARMY TO HAVE TRACTOR EVENT.

LONDON, Aug. 22.—Being in the market for automobile tractors capable of handling eight-ton loads, the British Army authorities announce a competition for February next. The vehicle winning the competition will be bought at the conclusion of the trial at the price stated on engagement blank, providing the experts consider it suitable for army work. The authorities also promise provisionally to buy other vehicles if satisfactory.

Full liberty is given in the class of engine and fuel used, but price of the tractor must not exceed $5,000. Economy in fuel consumption is essential, and liquid having a flash point of less than 75 degrees Fahr. will be barred. Kerosene may be used for starting, providing the engine can be started from cold in less than twenty minutes. Points on which the awards will be made are, among others, distance and average speed at which eight-ton loads can be hauled without replenishments, cost and efficiency, hill climbing power and ability to work away from highways, accessibility, ease of repair, absence of noise, vibration, etc.

The test will extend over fourteen days, during which time the vehicles will have to run over level and hilly roads, submit to brake tests and be dismounted for examination.

GRAND PRIX CARS AT BROOKLANDS.

LONDON, Aug. 27.—Grand Prix racers will have an opportunity of showing their ability on the track in a race that has been specially designed for them at Brooklands, Saturday, October 3. The general conditions as regards engine sizes, weights, replenishments, tire changes and colors are the same as those for the French 1908 Grand Prix. The distance will be about 100 kilometers. Eight cars of non-British origin must be entered, or the executive committee will have the right to declare the race void. The sporting commission of the French club has been invited to appoint three stewards to adjudicate on the race in conjunction with the British representatives, and the automobile club of each country having made an entry is invited to appoint a representative. Entries close on September 25, the fee being $200 per car, of which sum $160 will be returned if the car starts.

Nazzaro, the famous Italian racing driver, winner of last year's Grand Prix, has announced that he will give up racing for 1909. In September he is to lead to the altar a charming young lady of Turin.

Seven Bluecoats in a Gearless Great Six Patrol Car.

LOS ANGELES HAS AUTOMOBILE PATROL.

Los Angeles, Cal., Sept. 5.—The police department of this city recently acquired a Gearless "Great Six" for use as a special patrol car. It is fitted with searchlight, fire extinguisher, stretcher for injured persons and other special appliances for police work. The photograph shows the car with full load of bluecoats in front of one of the police sub-stations. It has been in use for over eight months now and has made such a good impression on the authorities that they have placed with the Gearless Motor Car Company an order for a special 14-passenger patrol car. This will be fitted with a solid paneled enclosed body, and will be the largest automobile patrol in use in the United States.

AUTO TRUCKS WITH FLANGED WHEELS.

In the illustration shown below is one of the new 2,000-pound trucks sold by the H. H. Franklin Mfg. Co., of Syracuse, N. Y., to the Thacker Coal and Coke Company, through the Franklin Company's Philadelphia agents, the Quaker City Automobile Company. This truck has been fitted with steel-flanged wheels, and will be run upon the railroad tracks throughout the Pennsylvania mines and shipping yards of the Thacker Company for carrying supplies and general utility purposes.

This use of the automobile truck in the transportation of coal mine supplies is another step in advance, and proves the great variety of uses to which trucks can be put. It can be made to effectually supersede the time-honored hand car, and will undoubtedly supplant it in the near future for general railroad purposes.

Franklin 2,000-lb. Truck for Pennsylvania Mine Work.

NEW BUILDINGS FOR PEERLESS

Cleveland, Sept. 2.—Within the next two years, within a month or two, the Peerless Motor Car Co., o will spend in the neighborhood of $750,000 for new adding them to the present group. The new structu erected just north of the present plant.

The first of the new structures will be built in the n and will be a repair shop 53x130 feet long. It wi stories high, of reinforced concrete and steel. The cos the neighborhood of $26,000. The rest of the buildi new arrangement will cost upward of $350,000 with that will bring the total well up to $750,000. This v a new erecting and assembling building with machir front of which structures will be the administration offices, respectively. When completed, the front will attractive design.

The present plant, consisting of machine shops, er assembling shops, foundry and other departments, is high. The extensions will all be three stories. Th it now stands was developed in about three years. A street will separate the present and new groups. Th tion as planned will take about two years altogether

Shearing Sheep with a Cadillac in New Zeala

HOW RAMBLER PARTS ARE SUPPL

Kenosha, Wis., Aug. 31.—All automobile factories nize the importance of being able to fill orders for r with quickness and dispatch. Thomas B. Jeffery and of this city, the makers of the Rambler, claim to ha duplicates of every part of every Rambler manufac 1902, and further to be able to ship replacements or day the order reaches the factory. This promptness the thorough organization of the sundry departmen parts supplied on order are inspected by two men accuracy, and again, in the shipping room, the ord stamped and double checked to avoid mixing orders The sundry department contains 1,500 bins of variou arranged in sections eight feet in height. In this kept only such parts as are in most frequent dema are stored in a reserve stock room. In addition th annex, motor stock, transmission stock and axle stock

The fact that there are fourteen thousand Ramb use, many of them now in their fifth or sixth year makes this department very valuable to owners, whi that all Rambler parts are made in the Rambler fact the company to supply them very cheaply. Although t may not be needed during the first or second season tion, the company sees the wisdom of manufacturing ing on hand extra parts of all models so that in yea owners may procure them without delay and at a reas

PLANS FOR THE "AMERICAN" TRUCK.

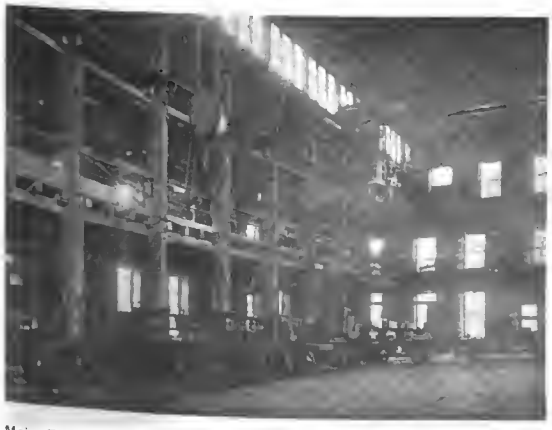
LOCKPORT, N. Y., Sept. 8.—The recent announcement that E. B. Olmsted, one of the pioneers in the manufacture and sale of commercial automobiles, had taken over the management and control of the American Motor Truck Company, of this city, is an assurance that the "American" truck will be frequently heard from next season. This company has been manufacturing commercial vehicles exclusively since 1904. Two years ago a large building formerly occupied by the Holley Mfg. Co., was secured and equipped with modern machinery and appliances, and all parts of the truck are now made in this plant. Plans are now under consideration for extensions to permit of a larger output. The main erecting room occupies the entire ground floor of the main building, which has an area of nearly 25,000 square feet. Most of the machine work is done in the galleries. The testing room and the body making and wood working departments have an area of about 4,000 square feet each. The plant is equipped with traveling cranes for facility in handling heavy parts, an air compressor for riveting, electric drills, and in fact every modern appliances for performing the best work in the shortest time. The entire machinery of the plant is driven by electricity, the current being generated at Niagara Falls, twenty miles distant.

E. B. Olmsted

As to the plans of the company for 1909, Mr. Olmsted states that in addition to its three and five-ton gasoline trucks and passenger stages, it will have a line of trucks and delivery wagons from one ton upward, and passenger vehicles from ten passengers up, both open and closed types.

El Paso, Tex.—Probably the first public delivery service by motorcycle is that enjoyed by this city. An interprising motorcycle agent originated the idea, and now has a complete system for either quick delivery or messenger service. The rates are very reasonable, and it is obvious that in the way of speed the motorcycle has a very perceptible advantage over the usual messenger boy with his cigarette and "Diamond Dick."

Tampa, Fla.—The automobile line between Bartow and Mulberry, the formation of which was announced recently, has proved such a success that the management has been forced to put on another car. In addition a trip is made to Tampa on Sundays.



Main Erecting Room, American Motor Truck Co., Lockport, N. Y.

Rapid Cars Loading Passengers at Station for Mudlavia.

COMMERCIAL RAPIDS CHEAPER THAN LIVERY.

ATTICA, IND., Sept. 8.—Five miles from the railroad station at Attica is "Mudlavia," a resort very popular with people from Chicago and St. Louis because of its mud baths. The hotel can accommodate about two hundred guests comfortably, and represents a large investment. Formerly a livery service was maintained between Attica and the Mudlavia Hotel, but early this year it was replaced by an automobile service. Three cars, furnished by the Rapid Motor Vehicle Company, of Pontiac, Mich., are used, two for passengers, twelve-seated, and the other for baggage. Now, upon arriving at the railroad station at Attica, guests are taken care of by uniformed attendants, placed in the automobiles and taken for a five-mile spin, through a beautiful country and over some of the best roads in the State, reaching the hotel in about half an hour. From four to eight trips are made a day with each car, meeting all trains and eliminating any waits for conveyances. The service is in every way superior to that of the horse livery, and is maintained at a saving of about $250 a month. The Kramer-Allen Motor Company, of Attica, which cares for the cars, has made out the following statement of the expense of the service during the month of June:

Items—	'Bus No. 1.	'Bus No. 2	Truck.
Driver's salary	$40.00	$40.00	$36.00
Cost of oil	2.70	4.50	1.57
Cost of gasoline	10.78	16.06	12.10
Miscellaneous	39.60	28.93	59.85
Total cost	93.08	89.49	109.52
Gallons of oil used	6	10	3½
Gallons of gasoline used	98	146	110
Number of passengers, regular	240	487	4
Number of passengers, D. H.	32	51	17
Number of trunks	.....	.....	206
Number of days operated	18	27	29
Cost per day	$5.17	$3.31	$3.77
Number of miles operated	506	990	660
Cost per mile	$1.182	$ .093	$1.65

These results are the more remarkable when it is considered that the cars were run, not over paved streets, but over country roads which, although good of their kind, were far from ideal.

ILLUSTRATING THE GROWTH OF AUTOING.

Washington, D. C.—The old horse-drawn sprinkling carts will soon disappear from the streets of this city, and will be replaced by the latest type of automobile sprinklers. Superintendent McFarland, of the local water department, is responsible for the change. He is a firm believer in modern methods and succeeded in converting the commissioners to his view of the question.

Columbus, Ohio.—An automobile line has been started by Columbus promoters between Marysville and Magnetic Springs, connecting with the interurban line to Marion, Richwood and Columbus. The car carries 32 passengers and makes two trips daily.

Greensburg, Ind.—Greensburg and Clarksburg are now connected by a new automobile line, and another will shortly be established between Greensburg, Osgood, Napoleon and Versailles.

The "Blue Bird" Captures a Deer en Route.

600 MILES THROUGH THE MOJAVE DESERT.

The same Chalmers-Detroit Forty *Bluebird* which won the Rocky Mountain Cup race at Denver last Memorial Day has just completed a wonderful trip of 600 miles through the Mojave Desert of Southern California.

The tourists encountered quicksand, rivers, mudholes and a cloudburst, in addition to the ordinary desert obstacles of deep sand, cacti, hills and gullies. The car averaged 30 miles an hour, which is very high for that kind of country.

The party consisted of Lawrence Knapp, an expert driver, and Joe Desmond, a wealthy business man of Los Angeles. Their objective point was Owens River, from which a huge aqueduct, 250 miles long, is being built to supply Los Angeles with water.

In fording a pond apparently shallow, 85 miles out of Los Angeles, the car was nearly submerged at a place where the road had been washed away. The magneto was soaked and had to be dried out in the hot sun. No other trouble.

In Red Rock Canyon the party encountered quicksand. The car sank until the runningboards rested flat on the surface of the sand. Only by the hardest kind of work was it jacked up and pulled out. The following day heavy rain and mud were encountered. Two days were spent visiting various camps and then the return journey was made. Driver Knapp reported that except for taking the magneto apart to dry, not a single adjustment was made on the entire trip.

It will specially interest American tourists to learn that the Dowager Queen of Spain has been the first motorist to legitimately cross the great St. Bernard in an auto. The Italian side of the road is open, the Swiss, on the other hand, closed, and as Her Majesty desired to pass she telegraphed to the Swiss government for permission, which was at once granted.

Emerging from San Francisquito Canyon.

THE AUTOMOBILE CALEND

AMERICAN.

Shows and Meetings.

Sept. 18-19....—Cleveland. Third Quarterly Meetin
Society of Automobile Engineers.
Sept. 25-26....—Atlantic City, N. J., Good Roads and
Convention, Associated Clubs of New
Dec. 31-Jan. 7..—New York City, Grand Central Palace
nual Automobile Show, conducted by t
Motor Car Manufacturers' Associatio
hibits by the Importers' Automobile
Alfred Reeves, general manager, 29 \
Jan. 16-23.....—New York City, Madison Square Ga
Annual National Show of the Associ
censed Automobile Manufacturers.
Secretary, 7 West 42d St., New York
February, 1909..—Chicago Coliseum and First Regim
Eighth Annual National Exhibition, M
sociation of Automobile Manufactur
date to be announced.)

Races, Hill-Climbs, Etc.

Sept. 19-26.....—Kansas City, Mo., Eight-day Reliabil
tomobile Club of Kansas City.
Sept. 23-24.....—Boston to White Mountains and Ret
Endurance Run, Bay State Automobi
Oct. 1-2.....—Indianapolis Two-day Reliability Ru
Lick Springs and Return, Indianapoli
Trade Association.
Oct. 3.....—Morristown, Madison, Chatham, N. J.
Carnival and "Tour Around the Worl
M. C. A. auspices.
Oct. 6-9.....—Chicago, 1,000-Mile Reliability R
Motor Club.
Oct. 7-9.....—Cleveland, O., Three-day Reliability
Cleveland Automobile Club.
Oct. 17.....—Hartford, Conn., Hill Climb. Automo
Hartford. (Probable Couree, Avon
Oct. 24.....—Vanderbilt Cup Race, Long Isla
auspices of Vanderbilt Cup Commis
Nov. 26.....—Savannah, Ga., Grand Prize Race, Sav
mobile Club.

FOREIGN.

Shows.

Sept. 24-Oct. 4..—Bourges, France, International Ex
Agricultural Motors.
Oct. 11-18.....—Paris, International Congress and
hibition on Roads and Road Making
Locomotion. French Ministry of Pub
Nov. 28-Dec. 13—Paris, Eleventh Annual Salon de
Grand Palais, Automobile Club of Fr
ure Vehicles, etc.)
Dec. 20-28.....—London, Stanley Show, Agricultural
Dec. 22-29.....—Paris, Eleventh Annual Salon de
(Commercial Vehicles, etc.)
Jan. 16-25.....—Brussels, Show Organized by Belg
Syndicate, Palais du Cinquantenaire

Races, Hill-Climbs, Etc.

Sept. 10-13.....—France, near Compiegne, Coupe des
organized by L'Auto.
September.....—Paris, Vichy Aeroplane Competition,
Aero Club of France.
Sept. 23.....—Isle of Man, Race for the "Graphic
Sept. 24.....—Isle of Man, "Four-inch" Race for th
Trophy.
Oct. 2.....—France, Gaillon Hill Climb.
Oct. 11.....—Berlin, Germany, Gordon Bennett E
Aeronautical Club of Berlin.

A RACE MEET IN CHADWICK-TO

POTTSTOWN, PA., Sept. 7.—I. C. Winford and W.
Philadelphia newspaper men, have been granted a s
series of races on the mile trotting track here, to t
the afternoon of Saturday, October 3. The main
program will be a 100-mile race, in which it is e
track figures will be created for the distance. As
now the home of the Chadwick car, it is expected
Houpt will take advantage of the opportunity to g
derbilt candidate a thorough try-out.

Lighthouse That Warns the Mariner at Montauk Point.

The Lonely Road Across the Meadows to the Light.

Where the Headland of Montauk Point Meets the Sea.

TO MONTAUK POINT AND RETURN.

By PATHFINDER.

How many tourists, residing in Greater New York, have explored Long Island from end to end? Fewer, I will wager, than have visited the White Mountains, the Maine woods or the Adirondack region. The reason is not far to seek—we New Yorkers have a habit, when we wish to go sightseeing, of journeying far afield and neglecting the wonderful things which are at our very doors. For my part, I must confess that, until last week, I had never been further east on Long Island than Southampton, and I certainly would not have thought of taking such a trip as that which I am about to describe had not the promoters of the "Mechanical Efficiency Contest," to be held by the New York Automobile Trade Association, asked me to lay out a route to Montauk Point and return.

Leaving Columbus Circle (which is to be the starting point of the contest), we journeyed in our 30-horsepower White steamer to the country house of the Crescent Athletic Club, on the Shore road at Bay Ridge. This is the point on Long Island which is farthest west and it has very appropriately been selected as the place where the contestants will begin to travel on a schedule. Continuing to Bensonhurst, we turned from Twenty-second avenue into Kings highway, which is one of the oldest thoroughfares on Long Island. It winds in and out to Gravesend, then over towards Sheepshead Bay and through the old Dutch settlement of Flatlands. There are a number of old houses on this road which date back to Colonial times. Then we get back to the activities of to-day as we reach the Eastern Parkway and travel by the usual route to the great Merrick Road, which we follow through Lynbrook, Rockville Center, Freeport, Massapequa and Amityville to Babylon. Then, continuing straight along this same road, now called the Southern boulevard, we pass the magnificent estates which line the shore of Great South Bay—through Bay Shore, Islip, Oakdale, Bayport and Blue Point to Patchogue. Now we have reached the great Long Island "Summer boarder district," and we pass quickly through Bellport, Brookhaven and the Moriches to Quogue. Then we come to Good Ground and the famous Shinnecock Hills and finally to Southampton, where again we see many magnificent country estates. Then, after passing through a few more towns, the names of which end in -hampton, we reach Amagansett. Up to this point the greater part of the going has been over fine macadam roads, with hardly a suggestion of a grade. We have also noted with pleasure that the custom of oiling the roads is wellnigh universal in this section. But east of Amagansett we get something very different—not only a different style of road but different vegetation, different topography and different scenery from anything we have ever seen before on our travels.

The twenty miles of country from Amagansett to Montauk Point is made up of sand dunes. For miles at a time one does not see any vegetation except a sort of rank, stubby grass. There is no road in the usual sense of the term. The wagons, traveling in the same ruts, have worn a well-defined path and no one need have fear of losing the way. In some places the going is rather heavy and in spots it might even be called swampy, but certainly there is no obstacle which can bar the progress of a good touring car. It is about time to put an end to the myth that "the road beyond Amagansett is practically impassable." As for our White steamer, it plows through the sand and up the short grades with no more apparent effort than when on a macadam road.

There can be no question but that the eastern end of the island is very desolate. Not a habitation is seen and no wagons are met with along the route. Occasionally the road, or to speak more accurately, the trail, approaches close to the edge of the crumbling sand cliffs and we see and hear the waves breaking upon the shore, 40 to 60 feet below our feet. Let nothing more be said about "the waves washing over the road." Possibly a tidal wave would do so, but not the kind that ordinarily corrugate the surface of the broad Atlantic.

The first building we see after leaving Amagansett is the U. S.

life-saving station, five miles from the town. We proceed an equal distance and then pass another life-saving station. Evidently this is a dangerous section of the coast for the mariner. Now our road bears away from the shore and we skirt the edges of a fresh water pond. Then Montauk Inn comes into view and, after a stiff quarter-mile climb, we alight at this delightful hostelry.

From this vantage point a splendid view of the surrounding country is presented. In the very desolateness of it all, there is something akin to grandeur. But those sandy hills were not always bare. Ten years ago, at the time of the Spanish War, somebody blundered and ordered some 20,000 soldiers to pitch their tents here—in a delightfully healthy climate, to be sure, but there was no barrier between these valiant men and starvation, except a single-track railroad. Finally, as we all know, everything was straightened out, but not until a third or more of the men were in the hospital tents. The dwellers in the little settlement on the shores of Fort Pond bay, a half mile from the inn, will tell you all about the scenes of a decade ago—but the subject is not a pleasant one to pursue further. Besides, no one is supposed to discuss any phases of war, except its "glories."

The settlement of Montauk, where the inn is located, is at the end of the railroad, but not at the end of the island. We have a journey of 6 1-2 miles across the dunes before we reach Montauk Point, on the very extremity of which is the lighthouse. Here we are greeted by the keeper, Capt. Scott, who has been "on the job" for 23 years. He looks over our machine critically and remarks, "They certainly make fine automobiles nowadays. I s'pose people will soon be traveling here in airships." "May Heaven help them if they do not make a landing here," we reply, gazing out toward Europe.

Retracing Our Steps to the Metropolis.

From Montauk Point we retraced our way across the dunes to Amagansett and then along the Southern boulevard to Good Ground. Here we turned off to the north and made our way through Riverhead to Wading River, where the sound comes into view. The topography of the north shore of Long Island is so different from that of the south shore that one can hardly believe that only a scant six to twelve miles separates the two coastlines. While the south shore is as flat as the prairies, the north shore has all the characteristics of a mountainous region, which means that the road leads constantly up and down hill and some of the grades, it might be said, require a wide-open throttle, even on our car.

On we go through Port Jefferson, Setauket, Stony Brook, and Smithtown. Then we pass through the grounds of the great State institutions at Kings Park where maniacs are confined —all except speed-maniacs, most of whom are still at large.

Then we go through Northport, Huntington and Oyster Bay. Just as we are leaving the latter town, we catch a glimpse of President Roosevelt and Mrs. Roosevelt as they whirl by us in one of the government White steamers. We toot our horn uproariously and the President acknowledges this "automobile salute" by tipping his hat. Then after passing through Glen Cove and Sea Cliff we come to Roslyn and Manhasset, of Vanderbilt race fame. Keeping straight ahead on Broadway, we continue into Flushing where, in the two-day contest of next week, the contesting cars will check in for the last time and will then proceed on whatever schedule they may desire to the finishing point at Columbus Circle. It is a safe prediction that all who take part in the run, even the veterans of the A. A. A. tours, will describe the 300-mile journey as the most interesting and picturesque two-day trip of their experience.

Prince Henry of Prussia is very content with the proposal to wind up next year's race in South Germany and to hold the speed trial on the flat in Forstenried Park, near Munich. It is quite likely that Austrian territory will be taken in as well. This race is now the principal event on the German automobile calendar, and is fast assuming international importance.

Spending Some of the Fifty Millions of State Roa

Stretch of Completed New State Road Near Bl

Tourists Will Pass "Idle Hour."—W. K. Vanderb

Where the Road Circles Round Fort Pond at

WILKES-BARRE IS AN ACTIVE AUTOMOBILING CENTER

By F. S. SLY, Traveling Correspondent of The Automobile.

WILKES-BARRE, Pa., Aug. 31.—This city may easily be put down as one of Pennsylvania's chief centers of autoing, for, considering its size and situation, it is really ahead of Philadelphia on the east, or Pittsburg on the west, where live interest in automobiling is concerned. Much of this is naturally due to the Wilkes-Barre Automobile Club, of which George F. Lee is president, Peter A. Meixell, vice-president, and Dr. E. C. Wagner, secretary and treasurer, as there are few more progressive organizations of its kind to be found anywhere in the country. It now has 150 members and is doing a great deal of good work.

The plant of the Matheson Motor Car Company being located in this city also serves to keep the automobile and its interests constantly before the public, as the numerous testing cars from the factory are constantly on the go and always in evidence.

But interest is not confined entirely to the pleasure car, as on June 29 last the Wilkes-Barre Motor Transit Company started a stage line making a round trip of 3.1 miles in the city, the distance being covered in 30 minutes. The equipment consists of three Manhattan, 50-horsepower chassis, built by the Mack Brothers Company, Allentown, Pa. They have a four-cylinder vertical motor, equipped with a Breeze carbureter and a Splitdorf magneto, and fitted with a special type of 'bus body in which the entrance is at the front, so that the passenger has to deposit his fare in a special receptacle in close view of the driver. Two of the cars are kept on a 15-minute service, while the third is maintained in reserve for emergency purposes, as well to permit of an increase of the service in rush hours, such as on Saturday night. On Sundays only church trips are made. The fare is five cents each way, and the record for a single trip is 34 passengers, while the average day's travel ranges from 200 to 375 passengers per car. The cars seat 16 passengers comfortably. It was originally intended to employ electric lights, using storage batteries as the source of current, but this did not prove entirely satisfactory.

Generally speaking, the roads in this part of the State are bad; without making exceptions, it would be difficult to truthfully characterize them otherwise. At present, the best roads, and, likewise, the favorite drives of autoists in this section, are to Harvey's Lake, over Pocono Mountain, the middle road to Aspen, and to Newport Mountain. There is now under construction a State road running from Nanticoke to Wilkes-Barre, and this will serve to increase the available mileage open to autoists in this section by a considerable stretch of fine highway.

There are now four good garages here and quite a number of well-known cars are represented. The Wyoming Valley Motor Car Company handles the Locomobile and Buick; Ford is represented by an exclusive agency, also maintaining a garage. Robert Johnson represents the Rambler, Mitchell, and Knox; and William Lee has the Oldsmobile, each one of these concerns maintaining an up-to-date garage.

Anthracite Districts Have Few Good Roads.

SCRANTON, Pa., Aug. 31.—Roads in this section of Pennsylvania are very poor, with the exception of a single toll road on which 35 cents is charged, and the private roads of the Scranton Gas and Water Company, leading from the toll road to the various reservoirs of the company back in the mountains. These are remarkably well-kept stretches of macadam and constitute the favorite drives hereabouts, being crowded on Sunday afternoons.

Interest in automobiling is active, the Scranton Automobile Association, which was only organized last spring, now having 125 members on its roll out of a possible 350, which represents the approximate number of cars in use in the city and vicinity. The officers are: President, H. B. Ware; Vice-President, George B. Jermyn; Secretary and Treasurer, Hugh B. Andrews. The organization is a live one and keeps its existence constantly in the public eye by the use of a small club flag which is displayed on the cars of all the members. The number of these that are always in evidence round town makes the membership of the club apparently much greater than it is.

Quite a number of well-known American cars are represented here, and while dealers report that business has been fair all along, it is the opinion of the majority that it does not average up to what it was at the corresponding period of last year. The Thomas is represented by the A. R. Gould Wagon Company; Conrad Brothers handle the Ford, Premier, Reo, and Aerocar; and the Standard Motor Car Company represents the Pierce-Arrow and the Autocar, both the last-named concerns maintaining garages. A third is run by the Scranton Garage and Motor Company, which also handles the Franklin and the Buick.

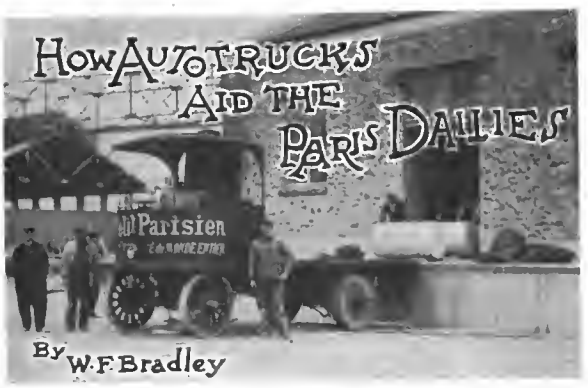
QUESTION OF WEIGHT IN THE BUILDING OF AUTOMOBILES

By CHARLES CLIFTON, George N. Pierce Company, Buffalo, N. Y.

THE Glidden and Hower runs, which have now gone into history, certainly justified the weight which we put into our chassis. We had no structural trouble of any kind. Our cars certainly ran every other car to the breaking point, covered more miles than any other, and were in shape to repeat the performance. Almost every car competing with us in this country has more or less rear axle trouble. We have practically none. Almost every car in the market has spring trouble, while we have practically none. Now, these results are not accomplished by light weight construction, or by cheap construction, and all these results can only be obtained by putting in weight intelligently.

If you will look over modern rolling stock in other lines, and other mechanical devices, calculated for long and strenuous use, you will observe practically as follows: All railroad equipment has been very much increased in weight. The pressed steel car, which is the most modern of its sort, is heavier and more expensive than the old wooden car, but it is more economical because of its longer life and less liability to accident. Take the experience of the Pullman Company with their cars. They have developed them along the same line that we have; namely, by watching them in the repair shop, and as the result of accidents, and the result is that the public is now satisfied to pay what the Pullman Company asks, if for no other reason than because the liability to personal injury in the Pullman car is practically nil. Looking also to the locomotive practice of to-day, where no effort is made to get light weight, but that service is the main consideration. This is the same in the development of electrical machinery. The cheap thing has no place in that line. These machines are built substantially for long and satisfactory use, all of which means weight, careful workmanship and the very best of material.

If you will look over the history of the motor car business for the past ten years, I think one fact will stand out preeminent; namely, that in all competition, at all times, and under all conditions, there is one great foreign concern that has always held its own where others have had meteoric periods of brilliancy. Tbis one concern has gone on in its quiet way building a heavy car, but always holding its own from year to year, and increasing its business, until it is one of the largest if not the largest producer in the world. I refer by this to the Panhard. This car, with equal power, is a heavier car than ours, but no one can gainsay its position in the trade.



Loading Up a Truck at the Door of the Paper Mill.

PARIS, Sept. 3.—Supplying an important daily newspaper with reels of white paper is an operation requiring as much regularity and as much dispatch as the supplying of the same paper, printed and folded, to newsdealer and reader. The capacity of modern rotary presses is enormous, so large, indeed, that the manager of many a city daily is sore pressed for space in which to store the huge rolls which later will be impressed with the news of the day. Floor space is generally limited, for rents are high in the neighborhoods in which daily newspaper offices are obliged to locate; the paper mill is usually miles away, for economy demands that trees shall be transformed into newspaper near the source of supply where water is plentiful, and where rents are low. Hence the necessity for frequent renewals of the long reels of white paper which furnish news for the millions under the touch of the rotary press.

In Paris the difficulty of supplying the printing presses with stocks of white paper is keener than in most capitals, not because the journals are larger, but because they are housed in cramped quarters, offering little room for reserve supplies. Circulations have increased, but the walls of the printing office have remained as before, with the result that now a daily supply is needed from the paper mill to keep the presses running. There is further complication from the fact that the printing offices are all around the most crowded portion of the main boulevards and are reached with difficulty by heavy horse teams. In bad weather, under the old system, the foreman printer was often on tenter-hooks regarding the next supply of paper; it only needed a frozen pavement or a lame horse to seriously jeopardize the success of the next edition.

The outcome was the introduction of the automobile performing regular daily services between the mills and the newspaper offices, and the almost entire abolition of the horse. At the present time all the more important dailies, such as the *Petit Parisien, Le Journal, Le Matin* and *Petit Journal* receive their supplies of blank paper daily and exclusively by automobile. As the papers mentioned, together with their auxiliaries, comprise all the most important dailies, having combined circulations running into many millions, the morning delivery van has become as standard as the milkman's cart on the main boulevards.

Nine-tenths of the paper for the Parisian dailies is supplied from mills at Nanterre, ten miles out of town. By horse traction this meant a journey of three hours, the road being a varied one of good granite paving, bad ditto, moderate macadam, a few hills, and crowded wood-paved boulevards. Taking six rolls as the maximum load for a two-horse team, this required eight different journeys for the delivery of the daily supply of any of the more important papers.

By automobile eleven to thirteen rolls are carried at once, the total weight being from 5 to 6 tons, the distance is covered in one hour and a half, and the return is made within the hour. Taking the *Petit Parisien* as one of the most representative of the Parisian dailies, the first load leaves the mills at 5 a. m., loading having taken place the previous day, and the rolls are deposited at the door of the press room 90 m Thirty minutes after the departure of the first vehi is ready to start, the service being continuous all d vals of half an hour. For the return the autom are if not empty, at least light, for all that has to l are the returns and waste paper.

Although some of the larger papers own and m own fleets of trucks, a co-operative system is ado others, while many more are supplied by the man a fixed inclusive rental, with a number of journeys

On an average the inclusive cost of transport this system works out at rather less than $9 pe vehicle making a maximum of three journeys per da ing a total of 15 to 18 tons of paper, exclusive returned to the factory. All the vehicles in use steamers, with their engine forward, and driven by to the rear wheels. Rubber tires are not used, all front and rear, being shod with steel bands.

The cost of a vehicle of this type, complete w for carrying rolls of paper, is about $3,000. As th of such a truck is ten years, the average amount off for depreciation is $300; interest on capital inv rate of 5 per cent, is responsible on an average year; various insurances, automobile and drivers' $100 per annum; maintenance and repairs work ou of $350 per annum. This makes a total of $83c which at the rate of 250 working days per year cost of $3.35 per vehicle per day. Running expense

Driver	$1
Coke, 4 cwt. per day	2
Oil, grease, firing, waste	0
Water	0
	$5
Maintenance, interest, etc.	3
Total per day	$8

Apart from the economic value of automobil traction for a service of this nature, there is public value by lessened congestion on the city's the first portion of the journey a speed of ten r can be maintained; on the hills this is cut down to hour, and later in the crowded portions of the cit tain hours, has to be reduced to a crawl of three Under all conditions, however, the five and six-t capable of keeping pace with the stream of ho the boulevards, the disturbance which was forme the two-horse teams—and is still caused by the maintaining horse service—being conspicuously ab automobile service. In cities such as Paris and L street traffic is particularly dense, heavy horse coming more and more of an obstruction. So the difference between the two systems of hau closing of more important highways to the heavie horse vehicles is already proposed.

Unloading Paper at the Press of a Paris

PROBLEM UNSOLVED: IDEAL ROAD FOR HEAVY MOTOR TRAFFIC

PARIS, Sept. 4.—Most important of the questions to be discussed at the international road conference which the French Government has called for October 11 to 18, in Paris, is the construction of the ideal road for heavy motor traffic. Though macadam with some anti-dust preparation will doubtless remain as the type of road for country highways, European experts are more and more of opinion that something more resisting will have to be employed for the main roads in the neighborhood of cities or on any highway having a large amount of traffic.

M. Chaix, the president of the Touring Committee of the A. C. F., is one of many in favor of a scheme of road construction consisting of a bed of cement five to seven inches in thickness, covered over with a layer of sand, then paved with smooth rectangular granite blocks, the interstices being covered with asphalt. A road on this system has been built in the neighborhood of Suresnes, in the suburbs of Paris, and although subject to very heavy traffic has remained in perfect condition. Such a road is naturally expensive to construct, and for a long time will never be regarded as other than a road de luxe. Its efficiency, however, is beyond question and has been so well proved that an extensive scheme is now on foot in the district to the north of Paris for the pulling up of the old, roughly laid granite blocks to be replaced by smooth ones on a bed of cement.

Though this type of road would doubtless be the ideal for automobiles, in the opinion of Dr. Guglielminetti, the secretary of the anti-dust league, it can never be very extensively adopted on account of its cost and the ill effects it has on horses. Though a fervent automobilist, Dr. Guglielminetti believes that the horse will be an important element on the main roads for a number of years and that some consideration should be had for his comfort. Asphalt, in the opinion of the anti-dust expert, would be more satisfactory than granite paving, for it produces neither dust nor mud, is silent and is easily and quickly repaired. The objection usually levied against asphalt that it is slippery in slightly wet weather is not a serious one, for there are methods of asphalting which entirely overcome this. This process is also more costly than macadam, the price of the latter in France being about $6,000 per kilometer, compared with $26,000 for a wood paved or asphalt road.

While the annual overhauling of Paris streets has been going on this summer it has been noticed that the portion of the Champs-Elysees reserved exclusively to automobiles was in excellent condition, while the side portions, used by horses alone, had been torn into strips until it was a mass of holes. The effect of the rubber tires was to wear the wood blocks equally smooth. The drippings of oil from the cars acted as a preservant, the remarkable result being that while the blocks used by horses could be torn out by a slight blow from the crowbar, the blocks that had never been pounded by a hoof were so hard that it was only with difficulty they were torn out of their bed.

NEW JERSEY GOVERNOR FAVORS GREAT OCEAN BOULEVARD

AT a banquet given him last Thursday night by prominent summer residents of the Northern New Jersey coast resorts at the West End Cottages, Long Branch, Governor J. Franklin Fort outlined a system of highways to be built and maintained by the State that, if carried out, will raise still higher New Jersey's good roads banner among those of her sister States.

First of all, Governor Fort proposed a great boulevard to extend for a distance of 127 miles along the ocean front, from Atlantic Highlands to Cape May. He said that for a considerable portion of the proposed route there were already fine gravel roads, and declared that by widening them and constructing the connecting stretches the proposed boulevard could be built at a cost of $300,000. The entire work could be completed in two years and much of it be ready for use by next season, provided the legislature made the appropriation at its next session.

In the opinion of the Governor the legislature could easily be persuaded to make the required appropriation were the cooperation of the inland counties secured. This he was confident could be obtained by including in the ocean boulevard project a scheme for connecting all the county seats by State highways. This would result in a system which would give 500 miles of roads built and operated by the State.

The cost of the annual maintenance of such a system would be but $300 per mile, or a total of $150,000.

In the course of his comprehensive speech Governor Fort touched upon New Jersey's present motor vehicle law. He declared frankly that the automobile had come to stay, and that the automobilist must be reckoned with and treated with reason by the legislature in its laws. The Governor then made the radical suggestion that the Governors of the State of Connecticut, New York, Pennsylvania, Delaware, and Maryland appoint commissioners to meet commissioners appointed by himself to discuss this whole question of automobile legislation and make recommendations for uniform laws on the subject a common-sense proposition that elicited enthusiastic applause from the seventy-five banqueters.

The chairman of the banquet, Jefferson Seligman, twitted the Governor on his recent speed-trap adventure. Speeches were made by Gen. J. J. McCook, Judge Wilbur A. Heisley, Isador Straus, Justice Victor J. Dowling and W. E. D. Stokes.

INSTRUCTIVE PROGRAM FOR GOOD ROADS CONVENTION

NEWARK, N. J., Sept. 7.—Announcement is made of the tentative program arranged for the two-days' session of the Good Roads' Convention at Atlantic City, September 25 and 26, by the Associated Automobile Clubs of New Jersey and the New Jersey Grange. There will be four sessions, one in the morning and another in the evening of each day. The evenings will be given up to the entertainment of the delegates and their friends by the Atlantic City Automobile Club.

The first session, that on Friday morning, will take up the general subject, "Good Roads." Among the points to be discussed under this heading are: "New Jersey Highways," "Good Roads from the Granger's Standpoint," "The Standpoint of the Dweller Along the Way," and "From the Automobilists' Point of View." Invitations have been sent out to speakers of note, and it is almost certain that favorable replies will be received in practically every case. The presence of Governor Fort is assured.

The second day will be given over to the consideration of the subject of road construction. Road authorities from this and other States will present papers based upon their personal experience in roads building. It is hoped that a demonstration of road-making machinery and dust-laying devices can be given in connection with the second day's sessions.

From the program as mapped out, this, like all such conventions, will go far to help the "good roads" problem and in addition will do a great deal to bring about a better understanding between the farmer and the automobilist.

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THE DANGER OF NEGLECTED ROADS.

Hardly a day passes that does not give the newspapers an opportunity to record another serious, often fatal, "automobile accident." Of course, those who understand the conditions can usually see just how far the automobile was responsible in each case; but among less informed people these incessant reports are strengthening the belief that the average automobilist belongs to the same class as the parachute jumper and the "wild, death-defying" circus performer. Why some of our ordinarily responsible and clear-sighted papers think it worth while to foster this opinion for the sake of a little cheap sensation-mongering is rather hard to understand. However, the Toledo, O., *News-Bee* has the courage of its convictions, and it is convinced that "speed mania" is not always to blame. The case in point is the accident in which the Rev. George Vahey and Charles W. Pohlmann were killed, about a month ago, near Sylvania, O. The *News-Bee* quotes from Coroner Faber's verdict:

"The evidence brought out at the inquest convinces me that the road where the accident occurred was in dire need of repair, and that this is true in many other sections of the country. It shows conclusively that roads in general are not given the attention they should receive in view of the extensive automobile traffic nowadays. In a word, township trustees and county officials have not kept pace with the times. The accident was directly due to the fact that the chauffeur lost his way. The law provides that guide posts be erected at road intersections, but it is generally disregarded. Had there been a guide post at the point where the chauffeur turned upon the wrong road the accident would have been avoided."

This is plain speaking with a vengeance. But there are two facts which cannot be denied: First, that roads are made for the people who use them, and, second, that a large and constantly increasing proportion of road users are automobilists. Therefore, roads should be adapted for automobile traffic.

No one denies that some automobilists use the roads improperly, and this element figures largely in the accident list. But the evidence at Coroner Faber's inquest showed that the Rev. Vahey and Mr. Pohlmann were traveling at a reasonable speed. The road was simply a death-trap, and the county officials responsible for its condition should be held guilty of criminal negligence, at least. They are nearly on a level with the men who equip excursion boats with fraudulent life-preservers and put rotten fire-escapes on their tenement houses.

Nevertheless, it might be timely to reiterate a fact which is daily becoming more self-evident, and that is, that automobilists themselves must assist in bringing about a reformation of their own black sheep, who are really responsible for the spread-heading of all automobile stories which have even the semblance of an accident.

* * *

SOME EXTERNAL IMPROVEMENTS.

Improvements in the external appearance of an automobile, although of course not so important as improvements in its mechanism, still have—and rightly—a considerable influence on its success. Most buyers take for granted that the various makes of cars they are considering will run and give reasonable satisfaction, and this being the case, they are apt to give more attention to the esthetic side. Surely a man cannot be blamed for preferring a neat, well-proportioned, cleancut car to a clumsy, heavy-looking one, with odds and ends of the mechanism hanging out at unexpected places; and he will usually find that the designer who has been careful of the exterior of his car has been careful of the interior as well.

The most marked improvement has been effected on the dashboard. Once upon a time people used to talk of a "well-filled" dash, the equipment of which might be inventoried as follows: ten oil-sight feeds (more or less); one large oil cup; one hand oil pump; two or three oil cocks, for various purposes, and several yards of pipe; one water pressure gauge; one air pressure gauge; one hand air pump; some more cocks; auxiliary air lever; ignition cut-out button, and perhaps some more. When the proud owner had added a speedometer, odometer, and clock, the result was indeed wonderful to contemplate.

But nowadays most makers limit themselves to the sparkcoil and switch, encased in a polished box to match the dash; a neat row of sight feeds may be permitted, and perhaps an auxiliary air lever, but that is all. Mud pans are now universal, and many cars have sheet-metal aprons between frame and running boards, concealing the unsightly exhaust pipe and muffler. Bodies are not only more comfortable and convenient, but their designs and coloring are in better taste. And these small improvements have done a great deal toward bringing the automobile into public favor.

LICENSED ASSOCIATION MANAGERS MEET.

The all-day session of the board of managers of the Association of Licensed Automobile Manufacturers, held in New York last week, had for the most part to do with the Madison Square Garden show matters. Much enthusiasm was evoked by the scheme of decoration adopted by the show committee as explained by Col. George Pope, its chairman. A magnificent triumphal arch is to be a conspicuous feature. There will be a new sign scheme, which will not only be more convenient to the public, but also enhance the beauty of the background. The structural arrangements will provide much additional floor space and a more effective ensemble as well. Space allotments for the show were made, but as usual not made public.

The resignation of Harry T. Clinton, head of the agency and publicity departments, was presented and accepted. In future E. P. Chalfont, assistant general manager, will have charge of the agency department, and Coker F. Clarkson, secretary of the mechanical branch, will look after the publicity.

It was announced that the recent aggressive policy of the association prohibiting dealers from handling unlicensed cars met with full support and will be continued with rigid enforcement. The committee in charge of the 1909 edition of the "Hand Book of Gasoline Automobiles"—which is the sixth of the series, reported progress. Members represented were:

The Autocar Company, Marcus I. Brock; Buick Motor Company, W. C. Durant; Cadillac Motor Car Company, W. C. Leland; Corbin Motor Vehicle Corporation, M. S. Hart; Chalmers-Detroit Motor Company, R. D. Chapin; Electric Vehicle Company, H. W. Nuckolls; Elmore Manufacturing Company, J. H. Becker; H. H. Franklin Manufacturing Company, G. H. Stilwell; Hewitt Motor Company, E. R. Hewitt; R. C. Glidersleeve; Locomobile Company of America, S. T. Davis, Jr., A. W. Robinson; Lozier Motor Company, H. A. Lozier, Jr.; Matheson Motor Car Company, C. W. Matheson; Northern Motor Car Company, V. M. Gunderson; Packard Motor Car Company, H. B. Joy, M. J. Budlong; Pesriess Motor Car Company, L. H. Kittredge; Georgs N. Pierce Company, Charles Clifton; Pops Manufacturing Company, C. E. Walker; Pops Motor Car Company, George Pope; Royal Motor Car Company, E. D. Shurmer; Selden Motor Vehicle Company, R. H. Salmons; F. B. Sterns Company, F. B. Stearns; Stevens-Duryea Company, C. C. Hilderbrand; Studebaker Automobile Company, W. E. Metzger; E. R. Thomas Motor Company, E. R. Thomas; Waltham Manufacturing Company, E. S. Church, O. G. Bechtel; Winton Motor Carriage Company, Thomas Henderson, E. P. Chalfant, assistant general manager.

HERE'S A GOOD KIND OF LOCAL SHOW.

HARTFORD, CONN., Sept. 7.—The show held under the auspices of the Hartford Automobile Dealers' Association at Charter Oak Park in connection with the grand circuit horse races and the Connecticut State fair was accorded an auspicious opening to-day. The weather was simply perfect and the crowd all that could be desired. Without the gates (no cars being permitted within the enclosure) were hundreds of cars neatly parked. The attraction is housed under the roof of the huge skating rink.

The various exhibitors have made good use of their space and many of the displays are very attractive. The Miner Garage Company display the Knox and Buick, and though agents of the Pierce, a car of that make could not be secured for the opening. Brown, Thomson & Co. display the Packard "18" and "30," Stevens-Duryea four and six-cylinder cars, and the Cadillac. The Corbin cars are well shown up, and the Palace Automobile Station offers the Oldsmobile, Thomas new six and four, the Autocar, and the E. M. F. Robert Ashwell displays the air-cooled Franklin, and Dunbar & Mansir of Holyoke, Mass., show the two-cycle Elmore. The Legate Manufacturing display the two-cycle Atlas in touring runabout and taxicab models. A. W. Peard shows the Overland in four and six models.

The accessories are well displayed and those of Brown, Thomson & Company to excellent advantage. Interest naturally centers in the 1909 models, and the Packard "18," E. M. F., Knox, and six-cylinder Thomas are centers of attraction. The Elmer Automobile Company make an effective display of the six and four-cylinder Fords. The Electric Vehicle Company display the 29-horsepower Columbia gas model.

MINNESOTA AUTOISTS MAY HAVE HARD FIGHT.

MINNEAPOLIS, MINN., Sept. 7.—Minnesota autoists will have a hard legislative fight this year in the effort to revise the automobile laws of the State. There is a general demand for the re-establishment of the system of State registration and State licensing, which was abandoned two years ago, when the legislature passed a law authorizing cities and municipalities to license and number cars. The secretary of State, in his report this year, strongly urges a return to the old system.

The Minneapolis Automobile Club has a new scheme, however, upon which its members are uniting, and which they promise to fight for upon the opening of this Winter's legislative session. It is proposed to exempt the automobiles from all taxes under the personal property assessments, and to levy in lieu of such taxes a State registration fee of from $5 to $75, based on the power and weight of the machine. This fee it is proposed to use for road improvement, as a State and county fund. The plan has the support of the Minneapolis automobilists, but will undoubtedly meet some opposition.

Secretary of State Schmahl, in his annual report, says:

"In view of the repeated requests from residents of Minnesota, as well as from other States, for licenses to operate automobiles in Minnesota, I cannot too strongly recommend to your honorable body the enactment of a uniform law governing the licensing of automobiles in Minnesota.

"The license, in my opinion, should be issued by this department and a uniform fee of $1.50 or $2 per annum could be charged without injury to the owner, and with great benefit to the State. At the present time there is absolutely no uniformity in the numbering of machines; each municipality or township organization has its own system of numbering, and as a result a large number of machines operated in Minnesota have precisely the same number, which must necessarily work more or less inconvenience to police and other officers of the law seeking to ascertain the ownership of certain machines.

"This department is daily in receipt of requests from residents of the State, as well as foreign residents, for these licenses, and the provisions for a State license should be made at as early a date as possible by your honorable body. There are probably in the neighborhood of 10,000 automobiles in this State, and an annual license of $1.50 for the operation of each machine would bring a fair return into the State treasury."

CONGRESSMAN JENKINS DEFEATED.

MILWAUKEE, WIS., Sept. 5.—Automobilists here are much interested in the results of the primary elections, of which the most surprising development was the defeat of Congressman John J. Jenkins by Irvine L. Lenroot. Congressman Jenkins was chairman of the Judiciary Committee of the House during the last Congress, and it was before his committee that Thaddeus Terry, chairman of the A. A. A. Legislative Board, made his argument for the Federal registration bill. The story of that argument is now ancient history; but it will be remembered that although Mr. Terry came forth with flying colors, having answered every objection and silenced every opponent, yet the bill which he championed was never reported. Congressman Jenkins was considered somewhat obstinate in the premises, and automobilists opposed his reelection. Now it looks as though they may have held the balance of power.

HONORING THE ROUND-THE-WORLD WINNER.

PHILADELPHIA, Sept. 7.—Mounted upon a dais in the handsome salesrooms of the Bergdoll Motor Car Company, at Broad and Wood streets, the New York-to-Paris Thomas reposed in state for two days last week while thousands of local motor enthusiasts paid homage to the victorious car and its driver. On Thursday night the big banquet hall of the Hotel Walton was packed to suffocation by those anxious to hear Orrel A. Parker's illustrated lecture of the long race. After the lecture there was a banquet, at which Louis J. Bergdoll, Fred Vanderhoof, George T. Verrault, Driver George Schuster, and several others had a few words to say regarding the race. Henry L. Hornberger presided. The lecture and banquet were under the auspices of the Quaker City Motor Club.

CLUB DOINGS IN ACTIVE AUTO CENTERS

DRIVING PRECEPTS FOR SANE AUTOISTS.

CHICAGO, Sept. 7.—President Ira M. Cobe, of the Chicago Automobile Club, in the bulletin of that organization, gives the following excellent advice to automobilists to drive with due consideration to other users of the road:

Rsmember that greater liberty is enjoyed by automobilists in Chicago than in any other largs city in the country. Rarely is an arrsst made except in flagrant cases.

Always slow down before turning corners, and look to ses that no machins is immediately behind you.

Nevsr turn directly around in ths street without warning.

Do not dart ahead of vehiclss in crowded thoroughfares. A few seconds' gain is poor compensation for the risk run.

Remsmber that women and children ars likely to do the wrong thing when danger threatsns. It is better to slow down or stop than to depend upon your skill at dodging.

As between injuring a pedestrian and damaging the car, smash the machine every time.

To run away after an accident is to confess yourself a coward, and an unfit associate for gentlemen.

An automobile hits hard. A serious or fatal accident will spoil ths sport for you for a lifetime. Let your motto be, "Safety first and speed afterward."

Drinking and driving should never be indulged in the same day. If you must drink, do your riding in a hack.

Finally, remember that, notwithstanding your car weighs 3,000 pounds, and a psdestrian 150, this is not a case where might makes right. Don't think that because you toot your horn it is necessarily up to the man on the street to do the jumping.

HERE IS A MODEL CONNECTICUT SIGN.

HARTFORD, CONN., Sept. 7.—The Connecticut Automobile Association is wide awake as to the practical needs of the motoring fraternity. Temporary signs will be erected immediately throughout tbe State wherever road improvements are being carried on. Tbese signs will contain full road directions. Speaking of signs, that above the South Glastonbury post office meets all demands. The background is black and the letters are gold. Tbe sign reads: "U. S. Post Office, South Glastonbury, town of Glastonbury, Hartford County, Conn., population 4,800, Hartford 9 miles, Middletown 9 miles." There one has the whole story briefly told with directions indicated. Vice-president Gillette of the Automobile Club of Hartford while secretary of the A. A. A. endeavored to have the government erect signs of this nature over its post offices tbroughout the country, but the contention at that time appears to have been that the federal government would not be benefited and the matter was allowed to drop. The sign above referred to can be seen from a distance.

Gilbert F. Heublein has returned from an extensive trip through the British Isles. Mr. Heublein dined the contest committee of the Automobile Club at the Heublein last evening. Mr. Heublein's daugbter is the wife of Percy Martin, superintendent of the English Daimler factory, and during his stay toured with Mr. and Mrs. Martin.

TOUR OF THE MICHIGAN CLUBS.

DETROIT, MICH., Sept. 7.—Keen interest is being displayed by clubs all over the State in the tour of the Michigan State Automobile Association scheduled for September 24-26. From present indications not less than one hundred cars will take part in the three hundred-mile contest.

Flint motorists will join the Detroit delegation and make the start from here, reaching Grand Rapids on the 24th. That evening a banquet will be given in the Furniture City, and on the following morning all the different clubs will leave Grand Rapids for Detroit. This will complete the tour for Detroit and Flint, Battle Creek, Grand Rapids, Kalamazoo and other motorists being required to run back to Grand Rapids in order to cover the 300-mile course. Several valuable trophies in the way of cups are offered participants. The Michigan association, Edwin S. George, and S. D. Waldron are donors.

PENNSYLVANIA'S FEDERATION IS ALIVE.

PHILADELPHIA, Sept. 7.—On Friday morning next there will be held at the handsome home of the Automobile Club of Germantown a meeting of the executive committee of the Pennsylvania Motor Federation and the presidents of the various clubs affiliated witb that organization to inaugurate a plan to bring about the passage at the next meeting of the State Legislature of new automobile and road laws.

President Robert P. Hooper, of this city, arranged the meeting, which will be held in the morning at 11 o'clock. The committee members and the club presidents will meet at the Union League and will be taken to the Germantowners' quarters in automobiles.

After listening to the reports of the various committee chairmen and the subsequent discussion, a plan of campaign will be decided upon, witb the result that the various club representatives will return to tbeir homes witb well-defined ideas as to how to go unitedly to work througbout the State in an effort to bring about a betterment of motoring conditions generally. Those attending the meeting will be the guests of the Germantown club at luncheon.

A. C. OF PHILADELPHIA DOING EXCELLENT WORK

PHILADELPHIA, Sept. 7.—The Automobile Club of Philadelphia is particularly active these days and is accomplishing much for the general good of automobiling in the vicinity of this city. During August 317 warning signs of various kinds were placed by the Roads, Maps and Signs committee.

The membership committee reported the election of 29 new members. The report of the law and ordinance committee contains the following pertinent advice:

"Your Committes begs to call your attention to the fact that in order to securs fair treatment we must be fair to others upon the highway and uss consideration in operating our machines. Public sentiment is without doubt beginning to concede that automobiles may be operated safely at a speed considerably in excess of that which may be permitted to horse-drawn vshicles.

"Every accident due to rsckless or negligsnt driving retards the development of this idea, but we wish also to point out to you that discourtesy to drivers or riders of horses and pedestrians, bscause of its greater frequency, is almost as detrimental.

"Give others their fair share of the road, turn out in ssason, do not drive under a horse's nose, do not pass horse-drawn vehicles at an excessive rate of spsed, and insist on your chauffeur's observing the same rules, and you will materially aid those who are working to secure the freedom of all motorists from annoying restrictions."

HARTFORD CLUB CLIMB, NOVEMBER 7.

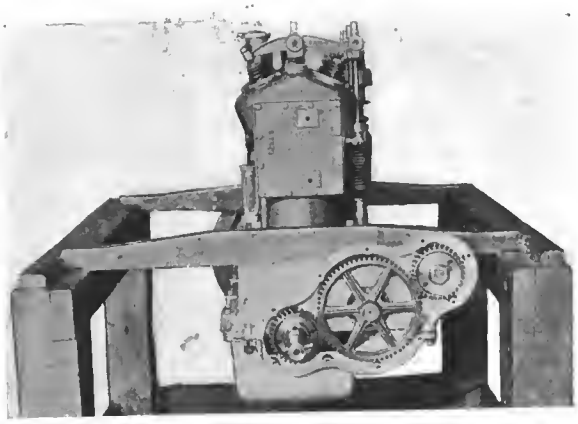
HARTFORD, CONN., Sept. 5.—The contest committee of the Automobile Club of Hartford devoted nearly all of to-day scouring Hartford county for a good hill for the forthcoming climb. Two weeks ago it was decided to make use of Avon mountain, one of the hardest climbs anywhere in this State, up the side of a mountain in fact. At a meeting of the board of governors early in the week the matter of the climb was thoroughly tbrashed out and it was deemed wise to conduct a still further search for a real hill. Accordingly grades in Newington, Griswoldville, and Glastonbury were inspected. One particularly stiff one was located at South Glastonbury, but it was considered inaccessible and the committee passed it. Another very promising slope was located on the Marlborough-Colchester road and this was much favored. The grade was tested and measured, and it was a toss-up between the Glastonbury hill and the Avon mountain course. Then the committee toured away out to Avon and tested out the hill. The first trial proved conclusively that the course at the last turn is a dangerous one, but after careful consideration it was decided that the Avon route will be the scene of the forthcoming event. The last turn will be banked to preclude the possibility of skidding.

Model 9K of the 1909 Stoddard-Dayton Line, with Top and Detachable Tonneau, Which sells at $2,700.

THE Dayton Motor Car Company, Dayton, O., since its inception in 1905 being a constant exponent of the medium-priced machine—the $2,000-$2,500 type—has, as if a leader in the forward march of price reduction, ready for next year three types of cars that embrace the $1,500-$2,500 manufacturing gamut, all of which are alike in chassis design, in the grade of material used and in the finish given, differing only in the size of parts to meet the demands for cars of different horsepower, different speed proclivities and different passenger carrying capacity.

Scarcely one of the 1908 Stoddard-Dayton principles have been discarded, but not a few of them have been amplified in minor details, all of which are footsteps in the path of evolution that the designer, Edwards, has been forging the car along since its inception. The valve-in-the-head motor with one rocker arm for the intake and exhaust valve of each cylinder remains unchanged; the contained crankcase lubrication shows detail modifications, the cone clutch with its leather facing is in place; so is the selective gearset; the shaft drive, and the double ignition system. In the list of alterations come the employment of integral water jackets for each cylinder pair, in place of the copper water jackets employed during this season. These new water jackets have large end plates secured by set screws with fiber gaskets between them and the cylinder walls, which plates allow of a simple twin casting and give good opportunity for removing core sand. Such jackets offer a simpler construction than copper. Locating of the fan pulley in rear of the half-time gear cover on the forward end of the motor has the advantage of not interfering with the removal of the aluminum plate forming the front of the gearcase and further eliminates the boring of the cover for the fan shaft extension which would give an opportunity for an oil leak at that point. A choice is given of four magnetos, two types of Bosch, Witherbee and U. & H., the latter a German product. The transmission has been improved by locating the gear shift lever outside of the frame at the right, motor devotees recalling how heretofore it was located in the floor board inside of the frame member, a location used to avoid perforating the side member of the frame for the lever of the change speed shaft and the brake lever shaft. While the frame side member is now perforated it is strengthened by the presence of a semi-oval bracket bolted to the outside of the frame and which carries and entirely encloses the change speed lever's lower end as well as taking the sector for the emergency brake lever. The bracket is a mud and dust-proof affair, entirely enclosed at its lower end, the only opening in it being the slot in which the change speed lever operates. An improvement in the three-speed selective gearset is the lengthening of the bosses on the transmission case for carrying the Timken roller bearings as well as using chrome nickel steel for the propeller and rear axle drive shafts where nickel and high carbon steels were previously in vogue. The running gear has undergone several modifications all taking the nature of enlargements. The side members of the frames have been increased in vertical depth 1-2 inch and the horizontal webbs added to the extent of 1-2 inch; brake drums on the big car are made 14 inches in diameter, where 11 1-2 sufficed, and the width has been raised to 2 1-2 inches. The drums are steel stampings instead of malleable iron castings. Road wheels, while enlarged in diameter in the small car, have been increased in strength by the use of twelve and fourteen spokes in front and rear and increasing the spokes to 1 7-16 inches in width. The side strut roads from the frame members to the rear axle casings are now made with a bolt and eye connection at the frame instead of the ball-and-socket joint of previous seasons. The steering connections now pass over the front axle at the right front of the car instead of under the axle, a change used on the majority of the 1908 cars and which takes this most important member of the steering mechanism out of the reach of

Gearshaft Control, Outside of Frame.



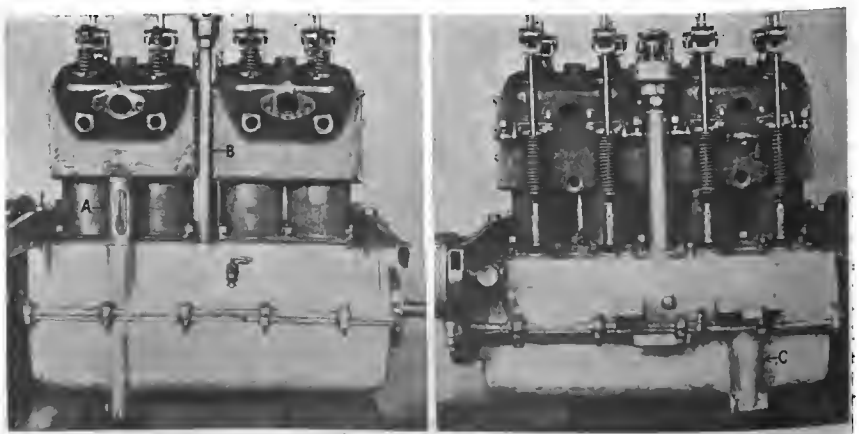
Three Motor Gears Instead of Four This Year.

road obstructions. The tie rod between the steering knuckles is in front of the axle. In the body work a change is covering the wood construction with cheap metal instead of a special textile fabric, the apparent aim being that while textiles are subject to variations in climatic conditions in various countries, sheet metal is not, the result being that a better enduring finish is possible. The body lines are practically as at present, except that the tonneau rear is a straight line from the base of the seat to the top, whereas it had a slight reverse curve; there also is a simplification of the tonneau door lines and the tonneau side lines at the same place. The different models are all alike in the employment of the oval radiator filling cap—a distinguishing Stoddard-Dayton mark—the straight wood dash and the throttle and spark controls or sectors under the steering wheel rim at the left where they may be controlled with the fingers of the left hand while the right hand is engaged in making changes of speed are other marks by which the cars for 1909 may be recognized.

Before going into detail on several of the systems in vogue on Stoddard-Dayton cars an enumeration of the models will serve as an introduction to some of these systems. The three types 9H, 9A and 9K carry motors with the following sizes: 9H, bore 3 7-8 inches, stroke 4 1-2 inches, and rated at 24-horsepower, A. L. A. M.; Model 9A, bore 4 inches, stroke 5 inches, with a formulæ rating of 25.6; and 9K, the same as at present, bore 4 3-4 inches, stroke 5 inches, giving 36.1 horsepower. The company gives a little higher horsepower rating than these: 9H, 25 horsepower; 9A, 35, and 9K, 45. The little 9H has undergone the most changes, now having the valve in the head motor, a wheelbase of 103 inches instead of 92, 32 by 3 1-2-inch tires, chrome nickel transmission, drive shaft and rear axle parts, larger brakes, a heavier frame and the motor stroke increased from 3 3-4 inches to 4 1-2 inches. This little car has body lines identical with the bigger brothers and is made with a detachable tonneau as well as regular two or three-passenger roadster. The Model 9A is a new style, coming as a half-way step between the little Model 9H and the big Model 9K. It is a five-passenger touring car with 105-inch wheelbase and 34 by 3 1-2-inch tires. As a roadster it is known as 9C, having a wheelbase 110 1-2 inches long in order to give a good suspension of the motor with relation to the front axle and introduce a rakish steering column. The big car Model 9K is the present Model 8K put through the metamorphosis process for 1909, as already delineated. Its wheel base measures 120 inches, and when fitted for seven passengers carries 34 by 4 1-2-inch rear tires and 4-inch sizes when fitted for five passengers. As a roadster this car is known as Model 9F and uses a 113 1-2-inch wheelbase.

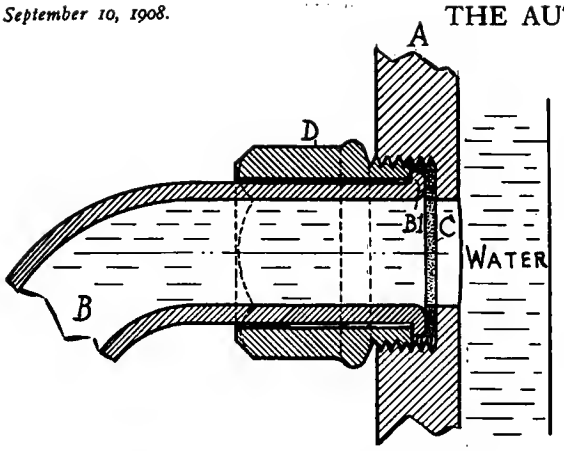
No part of the motor in all models offers greater interest than the oiling system, which in brief is a crankcase contained system, in which the lower half of the crankcase is divided horizontally by a sheet metal partition, that part beneath it being an oil reservoir in which a vertical plunger pump driven by eccentric off the camshaft and which pump delivers oil into a manifold attached to the upper half of the crankcase. From this manifold the oil is delivered to the crankshaft and camshaft bearings and the timer shaft. The overflow from these leads falls into the upper half of the crankcase and is refiltered into the oil reservoir. The system is therefore not a splash one but a positive transporting of oil to every motor bearing as well as to the cylinder walls. The manifold distributes oil by leads to the end bearings of the crankshaft, to the center crankshaft bearing, to the end bearings of the camshaft, to the timer shaft and to a sight gauge on the dash. Fig. — shows how each crankshaft bearing is lubricated. The oil lead *A* pours its contents into a pocket *B* above the bearing. In the bottom is a hole conducting the oil direct to the bearing but which outlet is not so great as the supply of the pipe *A*, with the result that the pocket overflows as indicated, the surplus dropping into a bronze ring *C*, carried on the throw of the crankshaft. This ring has a peripheral groove specially designed for catching this overflow and has an elliptical extension carrying an outlet *E* through which the oil finds its way into the bored crankpin of the crankshaft, centrifugal force driving the oil through this course. The crankpin is bored with an outlet *D* to lubricate the lower bearing of the connecting rod. In this system the oil has to be conveyed to the upper connecting rod bearing, which is done by attaching a copper tube to the side of the connecting rod. The rod at its lower end has an opening through the lower connecting rod bushing and at its upper end a similar opening through the wristpin. The oil once raised into the wristpin flows through it and reaches the cylinder walls which it lubricates. By means of an opening in the top of the wristpin oil is by the reciprocation of the piston thrown through this hole and, dropping, finds its way to the end bearings of the wristpin. Thus is the lubricating liquid positively conducted to the three crankshaft bearings; thence to the lower bearings of the four connecting rods, thence to the upper bearings of the connecting rods, and thence to the cylinder walls. It will suffice to say that the camshaft is similarly cared for, the overflow soon finding its way back to the reservoir.

A few words as to the care in oiling the vertical commutator

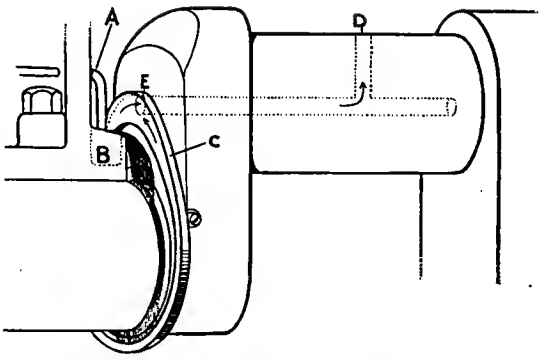


Intake and Exhaust Sides of Stoddard-Dayton Model H Motor.

A—Oil gauge showing level in crank case. B—Oil filler for crank case and oiler. S... models. C—Marks location of plunger oil pump. The channel support beams for moto... only in this model.



Attachment of Engine Water Pipe to the Cylinder.

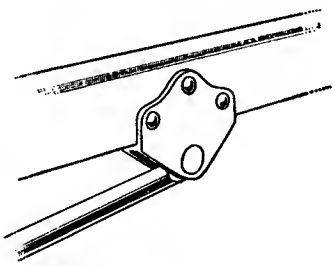


Lubrication of Crankshaft and Lower Connecting Rod Bearing.

shaft at the side of the motor is necessary. The hardened commutator shaft carrying on its lower end a driving bevel and on its upper end the revolving contact is supported in an aluminum casting within which is a bushing. A separate oiler lead pours lubricant into a cup ring receptacle on the base of the casting in which are holes to conduct the oil to the revolving shaft. On the shaft is a spiral groove which carries the oil upwards, distributing it through the entire ascent. The surplus at the top finds its way to the center of the mechanisms lubricating the plunger and other parts and is conducted to the space between the bushing and the aluminum castings in which it falls to the base again ready to overflow and lubricate the central camshaft bearing.

The plunger pump on which rests the burden of this complete circulation is carried in the lower half of the crankcase. The reciprocating plunger carries a roller on its top which contacts with the driving eccentric on the camshaft. This eccentric forces the plunger down and a spring lifts it. During the upward stroke oil enters the casing through a series of holes immediately beneath the plunger when at the top of its stroke. On the down stroke oil is forced out into the crankcase until these holes are closed by the plunger, after which the oil escapes through a lead to the distributing manifold already, its passage being by a check valve which prohibits its return. The pump can be dropped by removal of a casing secured to the base of the crankcase by three bolts. The pump has a 7.8-inch diameter and 3-4-inch stroke. Locating the pump so calls for 9 inches of external tubing, the only oil pipes seen around the motor, this length connecting from the exit of the pump to the upper part of the crankcase where connection is made with the distributing manifold. Attention is drawn to the oil gauge on the crankcase, which tells the level in the oil reservoir. It is a tube extending into a pocket in the base of the crankcase, a cork resting in the bottom of the tube and connecting by wire with a "flyer" in the aluminum top or gauge part. So delicate is the device that the addition of a pint of oil to the reservoir supply results in a lifting of the "flyer." The oil is fed to the crankcase or oiler through a filler tube rising to the top of the cylinders at the side. On the other parts of the car are compression grease cups in numbers. The valve rocker arms carry two each; the fan shaft has one, others are on the pump and magneto shafts, and in a review of the chassis they are positioned on universal joints, steering gear parts and spring bolts.

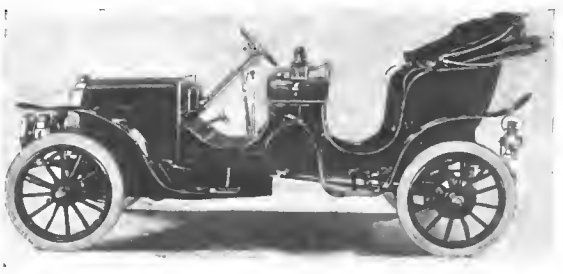
The manufacture of the upper half of the crankcase has been facilitated by removing the elevations on which the valve lifter rod guides rested in 1908, so that now the part of the crankcase on which these rest is on a level with the part supporting the four cylinders, so that the milling of all these parts is done with one operation instead of two as formerly. This year four gears were needed in the front of the motor, the camshaft gear being a double one, the large diameter part meshing with the camshaft pinion and the smaller diameter part for driving the pump and magneto shaft. By a nicety of dimension it is possible now to employ but three gears, the crankshaft pinion driving the camshaft gear and this in turn driving the magneto shaft.



Attachment of Radius Rod Bracket to Frame.

The Stoddard-Dayton cars are essentially homemade products. A foundry owned and operated by the company furnishes all of the cylinder castings, all the aluminum castings for the crankcase, gearbox, commutator support and all of the brass parts. In the steel building the side members of the pressed steel frames are forged, burnished and mounted together; in the same building all parts of the springs are made; side by side with the forges for making gear blanks and frames are those for making the one-piece front axles, the steering gear parts and the score of other forged parts that enter into the sum total of the car. All gear cutting is done in the machine shop, bodies are all made in a separate compartment. This delineation of home manufacture could be continued, but it will suffice to state that, with the exception of the electrical parts, carbureter, wheels and Timken bearings, the car is a Stoddard-Dayton product.

Model 9H 25-horsepower Which Sells for $1,500.



Model 9N Victoria Phaeton, a $2,000 Pattern.

NOW THE AUTO THIEF IS IN EVIDENCE.

DETROIT, Sept. 7.—The epidemic of auto thievery sweeping Detroit has roused local motorists to a sense of their helplessness under existing conditions, and plans are being laid looking toward legislation that will land the man stealing an automobile behind the bars just as surely as it now does the one who steals a loaf of bread.

There was a time when the owner of a machine felt secure if on leaving his machine he removed the switch plug. Not so now, however. The modern auto thief apparently carries a complete line of parts with him, and is able on a moment's notice to supply the missing article.

Within a week no less than half a dozen high-priced machines have been stolen as they stood on the streets, and several private garages have been broken into. In nearly every instance the machines have been recovered where abandoned when they broke down or the fuel supply was exhausted. Several are still numbered among the missing, however. That the thieves are not wholly devoid of a sense of humor is shown by the fact that John Dodge, of the Ford Motor Co., and Wm. F. Metzger, of the Everett-Metzger-Flanders Co., are among the victims.

At present there is no law covering the theft of an automobile, and the thief, even if caught with the machine in his possession, can only be given a slight fine or a short sentence at the workhouse. This fact has emboldened the thieves, but their harvest will soon be at an end if legislation planned becomes a reality.

CLEVELAND POLICE AFTER SPEEDERS.

CLEVELAND, Sept. 8.—Every "crossing cop" in the city holds a stop-watch in his hand; the bicycle squad has been increased 300 per cent.; orders have been issued to spare no motorist caught speeding. This, in short, is the condition of affairs in this city since Chief of Police Kohler recently decided that speeders belonged in the police list of "undesirables." It may be interesting to note in passing that the other "undesirables" consist of tramps, pickpockets, confidence men, burglars, yeggmen, suspicious characters, released convicts, etc.

Just what started the war is not known, as there had been very few complaints of speeding. But the Chief started in to "clean up the city of all undesirable characters before Winter," and so the poor man who drives a motor car finds himself up against it.

BALTIMORE DOESN'T WANT 'EM, YET.

BALTIMORE, Sept. 7.—Automobile fire engines, hose wagons and trucks will not be used in the Baltimore department yet awhile, as Chief Horton has decided that the horseless machines are not yet reliable enough for fire-fighting purposes. He has asked the Board of Fire Commissioners to furnish himself, his deputy chief and the district chiefs with steam automobiles to replace the present horse-drawn carriages.

BALTIMORE'S CLUB HELPING POLICE.

BALTIMORE, Sept. 7.—The crusade against those autoists who persist in speeding their machines within the city limits and on the crowded thoroughfares of the counties have had to pay numerous fines the past week. This crusade is a joint affair with the Automobile Club of Maryland, the Grand Jury and the motorcycle police on the one side and the autoists who attempt to evade the law on the other. Several local dealers have been among those who have fallen into the trap and they have been compelled to pay from $10 to $25 and costs for their sport.

KOKOMO'S FIFTEENTH AUTO ANNIVERSARY.

KOKOMO, IND., Sept. 2.—With a program of races and other events, the fifteenth anniversary of the building of the first gasoline automobile by Elwood Haynes of this city, was celebrated here to-day. The day was made a holiday, business houses and factories closing and hundreds of persons from all parts of the State gathering for the celebration.

The celebration was arranged by the Kokomo Automobile Club, assisted by business men, and cash prizes were awarded to winners of the various events which were held on downtown streets. The principal streets were roped off and for several hours were in the possession of automobiles and their drivers.

About 100 automobiles appeared in the parade, which was led by a band and a Rapid Pullman sight-seeing car carrying a party from Indianapolis. Many of the cars were artistically decorated, although the decorations consisted largely of flags and bunting.

OHIO REUNION OF OLDSMOBILERS.

AKRON, O., Sept. 5.—Seven miles of Oldsmobilers came from Cleveland, and their owners, with many others from other cities, attended the "grand reunion" of the Oldsmobile owners given by the Oldsmobile Company in Akron and at Long Lake. It was perhaps the largest procession of Olds cars ever seen in Ohio. Fifty-four cars came from Cleveland, and there were seventy-eight machines in the grand parade on the principal streets of the city and to Young's Hotel at Long Lake, where a sumptuous chicken and fish dinner was served.

The reunion was brought here because the Akron agents, Auble & Wood, of the Akron Automobile Garage Company, are the oldest agents of the company, A. Auble, of the local company, having been its agent since 1900. He has added to his fame by driving a perfect score car in the recent A. A. A. tour, and he will also drive a 1909 model in the endurance run starting Claude Foster. Another car present was the first car built with four-inch wheels for pneumatic tires. Among the cars with out of Toledo next Tuesday. This model was driven here by histories present were the *Mudlark* and Frank Work's *Wanderlust*.

After the drive to the lake and a photograph taken, a number of interesting contests were had, the slow race of cars on high gear exciting the most attention.

Photograph Taken at Long Lake, near Akron, O., of the Participants in the Oldsmobile Reunion.

Rambler Cars Being Tested on the Factory's Tarviated Half-mile Track.

The Factory Testing Track.—Most automobile manufacturers maintain a track of some sort where they can test new machines unhampered by local speed restrictions, but when these are constantly used by cars at high speed the problem of keeping them in repair often becomes pretty serious. The Thomas B. Jeffery Company, at their factory in Kenosha, Wis., had considerable trouble from this source, and experimented for some years with macadam under oil treatment and other road preparations, but all were found unsatisfactory until the Tarvia process was adopted. As every Rambler car, before being delivered to the purchaser, is run for about two hundred miles, this makes some fifteen or twenty cars running at high speed over the half-mile track every hour in the day. On the ordinary macadam track holes would immediately appear and the dust would be unbearable. Since Tarvia has been used, however, the track is entirely without dust, the surface coating makes it impervious to water and it is so elastic that the wear on the tires of the car being tested is greatly reduced. The success of the preparation on the Rambler track was so marked that it is now being used on all the nearby roads.

G & J Tires Reduced.—"It's a long story briefly told," said the sales manager of the G & J Tire Company, when asked for an explanation of the reduction in prices which took effect September 1. "To manufacture a moderate output requires precisely the same overhead expense for factory administration as a big output, and practically the same selling expense is involved. The 1908 G & J tire, when brought out last fall, met with such favor that we were encouraged to nearly double the already large equipment we had installed to manufacture it. Another important factor heretofore has been the large number of replacements required under the guarantee put on the tire. Our guarantee is still there, but our replacement department has been practically idle this summer. The tires have stood up so well that replacements have been an insignificant item of expense. All these things have naturally reduced the cost of production, and as soon as we became certain of this, we decided that the quicker we gave the consumers the benefit of the reduction the better it would be for us and for the automobile game in general."

Pierce Arrow Changes.—1909 Pierce Arrow cars will have the change-gear lever at the side of the car instead of on the steering column, and will also have a four-speed selective gear instead of the three-speed progressive type used heretofore. In explaining this change Col. Charles Clifton, the head of the Pierce Company, says: "We are firmly convinced that our old style was all that could be asked for in the way of a gear shift, but it was a question of our company against the world. The public has been educated to the idea of the selective gear, and we found it easier to make our cars conform to their way of thinking than to attempt to swing the balance of opinion our way. We are using the four-speed type because the public has been taught to look for this in cars of our power."

Exit the Tire Pump.—Not satisfied with having relieved Winton users of the arduous work of cranking, thanks to his self-starting device, Mr. Winton has gone a step further and abolished the tire pump. Attached to the self-starting cock on the dash of the new Winton Six is a nipple to which the user screws a rubber tube, the other end of which he attaches to the tire in need of inflation. Then he opens the cock and takes a rest, while compressed air from the starter tank rushes into the tire and fills it up. No one who has ever pumped up a tire on a hot summer day need be told what a convenience this is.

Firestone Salesmen's Reunion.—The annual meeting and reunion of the salesmen of the Firestone Tire and Rubber Company was held last week at the company's headquarters in Akron, O. There was a conference Thursday morning at which the past year's labors were reviewed and plans were outlined for the coming season. In the afternoon the gathering was taken to Summit in launches, and that evening they attended the theater. Friday evening the annual dinner was held at the Portage Country Club, and Saturday the conference was finally concluded.

Reo Stockholders Meet.—The annual meeting of the stockholders of the Reo Motor Car Company was held last week in Lansing, Mich., and the report shows the past year to have been the most successful in the history of the company, in spite of the industrial depression. The total volume of business during the last fiscal year amounted to $4,800,000. The officers of the company are the same as last year, namely: President and general manager, R. E. Olds; vice-president, Reuben Shettler; secretary and treasurer, E. F. Peer; general superintendent, R. H. Scott, and cashier, D. E. Bates, these also constituting the board of directors.

Look Out for St. Louis.—Benajmin Gerdleman, the St. Louis agent for the Jones Speedometer Company, has just secured an order from the police authorities of that city for the complete equipment of the motorcycle squad. The speedometer which will be furnished is practically the same as that used on automobiles; it is attached to the handlebar and driven by flexible shaft and gears. The scale reads to sixty miles an hour. Speed enthusiasts had better keep their eyes open now, for the cops "will get them if they don't watch out."

A New Continental Tire.—J. M. Gilbert, manager of the Continental Caoutchouc Company, New York, announced recently a new type of Continental, to be known as the "A-C" Flat Tread. Although sold at regular round tread prices, the new tire will have a straight guarantee of 3,500 miles service. The surface of the tread is corrugated, making it cling to the ground and giving greater speed. This corrugated tread also prevents skidding, and it is claimed that chains will not be needed when it is used.

Premier Century Run Ends.—The Premier Century car which started June 1 to cover 100 miles for 100 days, completed last week its one hundredth day's run and is now in Chicago little the worse for wear. It has covered in all more than 12,000 miles over all kinds of roads, through mud and sand and over mountains. President H. O. Smith of the Premier Company intends to have some Western club appoint a technical committee to examine the car after it has been taken apart.

A Fast Long-distance Tour.—Harry W. Byron of Mercersburg, Pa., has just arrived in Portland, Me., in his six-cylinder Franklin. He traveled 1960 miles in twelve days, running on an average ten miles a day. Mr. Byron declares that of all State roads those of Pennsylvania are the best. He attributes this to the fact that the roads are not so wide as others, but are crowned higher and rolled wet. They are especially good in the northeastern part of the State.

An 1897 Model for Sale.—The first automobile police patrol used in the United States, that of Akron, O., is offered for sale because of the purchase of a new and more modern machine. It was built by the city electrician, F. F. Loomis, in 1897, and has been in service ever since. In the riot of 1900 it was wrecked and thrown into a ditch, but was repaired and has since carried many hundreds of unhappy prisoners to the calaboose.

Ajax Tires Lower.—The Ajax-Grieb Rubber Company, of Trenton, N. J., has announced a material reduction in the prices of their tires for 1909, to take effect immediately. This has been made possible by largely increased production. For months past the company's plants have been working day and night shifts, in order to supply the ever-increasing demand for "the tire with the 5,000-mile guarantee."

Enter "The Vanderbilt."—B. S. von Rottweiler, until recently chief engineer and designer of the Fort Pitt Motor Mfg. Co., has organized a new concern to be known as the Mercedes Motor Mfg. Co., of New Kensington, Pa., and will bring out a new car, which will be called "The Vanderbilt." It will have a six-cylinder 75-horsepower engine and the price will be about $4,000.

Michelin Lowers Prices.—The Michelin Tire Company has just announced that the unexpected volume of business which has poured into their year-old American factory at Milltown, N. J., has enabled them to bring their production up to a point where their prices can be revised. The new list went into effect September 1 and consumers will derive a distinct benefit thereby.

Highway vs. Railway.—During the month of August 1,326 persons arrived at Hotel Mount Washington in automobiles, coming in 314 machines; arrivals by train were 630. Of course, most of the automobilists were transients only, but even at that no wonder the shrewd New England hotelkeepers are hastily building garages and buying in gasoline.

Fire Departments Up to Date.—The city of Frederick, Md., has an automobile fire engine and hose wagon in service and it has done some good work. The apparatus has three streams, with a pressure of from 125 to 150 pounds. The engine throws 450 to 550 gallons of water per minute. The hose wagon body carries 1,000 feet of fire hose.

News from Toledo.—B. O. Gamble, for several years the manager of the Toledo Motor Car Company, has just purchased the business and good will of that concern, which henceforth will be known as the Gamble Motor Car Company. Until a new building can be erected the business will be continued at the present location, 1115 Madison street.

Sailing to Savannah.—A large party of enthusiastic automobilists will sail for Savannah November 18 on the steam yacht "Idler," as the guests of Messrs. Fleming, Kull and Hamilton of the Gyroscope Automobile Company. On board the yacht will be the two Gyroscope cars which have been entered for the small car race.

Know Your Oil.—The Vacuum Oil Company of Rochester, N. Y., has brought out a booklet which will make it possible for the automobile owner to select the grade of oil best adapted to his car. It is claimed to contain the correct brand of Mobiloil for use in every car ever made.

The Driver and His Oil.—In a conversation with the representative of the A. W. Harris Oil Company just after the Lowell race on Labor Day, Lewis Strang, the winner, stated that he has used Harris oil in all of the three road-races which he has won—at Briarcliff, Savannah and Lowell.

Taxicabs for Baltimore.—The eighteen taxicahs to be operated in Baltimore by the Baltimore Taxicab Company are due to arrive this week. One of them was on hand last week and made a trial trip which proved very satisfactory. The cabs are the product of the E. R. Thomas Motor Company.

Oakland in the Glidden.—The Oakland Motor Car Company of Pontiac, Mich., is sending out a booklet telling the story of the Oakland entries in the Glidden Tour. It is attractively made up and is interesting reading. Copies will be mailed on request.

IN AND ABOUT THE AGENCIES.

Maxwell.—W. P. David has withdrawn from the Kelsey Motor Car Company, which represents the Maxwell car in Philadelphia, and W. C. Longstreth, the other partner, will continue the business alone at 204 North Broad street.

Chalmers-Detroit.—In the future the Chalmers-Detroit will be represented in Pittsburg by the Banker Brothers Company. Already a number of applications have been made for sub-agencies in Pennsylvania and West Virginia.

Chalmers-Detroit.—The Levy & Hipple Company, Chicago representatives of the Chalmers-Detroit, have completed plans for a three-story garage and retail establishment on Michigan avenue. The building will be white tile, 42x162 ft.

Elmore.—The Elmore Motor Company, of Los Angeles, Cal., has begun the erection of a new garage at 742 South Olive street, and expects to have it ready for occupancy October 1. It will be 80x167 feet, with a machine shop and ample storage room.

Stewart Speedometers.—The Stewart & Clark Mfg. Co., of Chicago, announces that it will shortly open a branch office in New York, which will carry in stock a large supply of Stewart speedometers and will have every facility for making prompt installations.

Premier.—Webb Jay, the well-known automobilist and former racing man, will handle the Premier in Chicago during the coming season. The Premier Century car, which has just completed its "100 miles a day for 100 days" schedule, is now in Chicago and is on exhibition at the Webb Jay Motor Car Company, in the Harvester Building, Michigan avenue and Harrison street.

PERSONAL TRADE MENTION.

C. E. Smith, who has been acting as traveling representative of the Fisk Tire Company, will in the future make Los Angeles, Cal., his headquarters, as assistant to C. O. Du Mars.

"Joe" Keir, formerly Renault and Fiat and Samson-Michelin tire agent in Philadelphia, has just closed with the Ajax-Grieb Rubber Company, of Trenton, N. J., to represent that concern's product in the Quaker City.

Russell E. Gilliam, formerly manager of the Empire Tire and Supply Company, has been appointed manager of the Newark, N. J., branch of the Empire Tire Company. He will be located at 264 Halsey street.

Fred D. Rathbun, formerly New England traveling representative of the Studebaker Company, has joined the forces of the Electric Vehicle Company. A large two-story garage will shortly be erected in Hartford, Conn., at Farmington avenue and Owen street, to handle gasoline and electric Columbias.

Charles B. Shanks, sales manager of the F. B. Stearns Company, will leave September 14 on a trip to the Pacific Coast, to establish a system of agencies from Vancouver and Seattle to Los Angeles. A branch house will be organized in California shortly if the trade comes up to expectations.

Two Leading Mitchell Exponents.
President William M. Lewis, at wheel, and Sales Manager James W. Gilson of the Mitchell Motor Car Company.

INFORMATION FOR AUTO USERS.

Willard Automobile Lighting Battery.—The strong and growing demand for electric light on automobiles makes this product especially acceptable, while the advent of the Tungsten lamp now makes it possible to electrically light a gasoline car very economically. The Willard Storage Battery Company of Cleveland, O., has for years manufactured the majority of the batteries used in this country for train lighting. The type E. L. B. battery, which has been designed for automobile work with Tungsten lamps is of the train lighting type, as the work required of the battery is practically identical with that required in train and Pullman car lighting. A number of very practical improvements are embodied in the construction of this battery. One is a chamber designed to receive the overflow of solution caused by expansion during charging. This construction also prevents any solution reaching the outside of the battery as a result of careless handling. The cells of the battery are placed in an acid-proof case, which is lined with lead. Each individual cell has its own cover, which is sealed into a frame at the top of the lead lining. Each cell also has its individual set of terminals. A band of hard rubber is vulcanized around each terminal to prevent the creeping of acid and consequent corrosion.

Willard Automatic Lighting Battery.

"Permanit" for Auto Tires.—A powder has recently been put on the market by Adolf Karl & Co., 239 Washington street, Newark, N. J., which they claim will not only prevent leakage of tires from punctures and blow-outs, but will also preserve the life of the rubber. "Permanit" not being a solvent in water will not form a paste or glue which might clog the valve, but on the contrary, when a puncture occurs the powder comes in contact with the outer air and causes a chemical reaction, whereby the injured part is healed. Because of the small amount necessary (only eight ounces to a tire), it can be used for high speed work.

"Permanit" is imported from Europe and is introduced for the first time in the United States. It is sold in cartons.

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THE AUTOMOBILE

Night Scene During Brighton Beach 24-hour Race—Coney Island is to Be Seen in the Distance.

AMERICANS ONE-TWO IN BRIGHTON BEACH "24"

TWO American Cars, both Loziers, one a "six," driven by Mulford and Cobe, the other a four-cylinder, piloted by Michener and Lynch, finished respectively first and second in the 24-hour race promoted by the Motor Racing Association at the Brighton Beach mile track, New York City, last Friday and Saturday. Both succeeded in surpassing the circular track record mileage of 1,079, made by Bernin and La Croix at the Morris Park 1.39 miles oval last year. The winner was 28 miles ahead of it and the second car beat it by 13 miles, with an average per hour respectively of 44.9 and 44.7 miles per hour.

A Fiat, a make that evolved victorious in the last 24-hour race held in the metropolitan district, was forced to accept the place of runner-up to the American pair. A Renault, the other European make represented, and, incidentally, the record holder, also went down in defeat, but through an accident in the second hour of the race, which put it out of the running altogether.

A Stearns, a Simplex and an Allen-Kingston followed in order in fairly close pursuit. Of the 11 starters there were practically 10 survivors, although one of these did not appear on the track during the last two hours of the contest.

The Winning Lozier.

The double victory of the Lozier was a popular one, not only by reason of its being an impressive American triumph, but from the fact that it came to the winning entrant, Harry A. Lozier, as a well-deserved reward for his persevering pluck in pursuing the racing game, which, save for a 24-hour victory at Philadelphia and an invariably creditable position among the leaders, had not been recompensed by any success.

That the meet was "outlaw" in that it was run without asking the sanction of the racing board of the national organization, has been too widely heralded to be unknown to any follower of the news of the racing game. Incidentally, there was a funny attempt on the part of Louis Strang to straddle or secure for himself possible immunity from punishment by making formal application, accompanied by a check, for a sanction from a member of the racing board. Needless to say the sanction was refused. It may also be worth while to note the report in circulation that the reason for the M. R. A. decision not to apply for a sanction was that a member of that body had been told by two A. A. A. racing board members that no sanction would be granted. This report was met by a posi-

Continentals Were Worn by the Winning Car.

Acme, Driven by Strang, Who Was Disappointing.

Michelin Tires Were Generously Used.

A Night View of the Garford Camp.

tive statement that the M. R. A. emissary either misunderstood or misquoted the reply given his question. This, however, was but one of the many rumors afloat to account for the action of of the M. R. A., most of which in all probability had nothing whatever to do with the stand the men interested decided to take.

The outcome of the meet showed that the public at large interests itself but little witb the sanction or anti-sanction controversy so long as it sees the prospect of good racing at the moment. There was a big, a very big, in fact, a record crowd in attendance on both Friday and Saturday nights. Tbe grandstand is credited with holding 3,500 and the field stand 2,800 people. Every seat in both was filled and there were probably several thousand more on the lawns in front. The gross receipts for the two afternoons and evenings are rumored to have approached $25,000 and the expenses to have been in the neighborbood of $14,000. With the horse-racing under a cloud and the season of the home-coming of the summer sojourners and tourists at hand, the racing and the excuse for a rendezvous were irresistible. The outpouring of automobiles was remarkable. Lawns and sheds were filled with them on both nights.

The men of the association are not inexperienced in the racing game, and they spared neither pains nor expense to insure a well-conducted meet. They were able to call to their assistance competent officials, with the result that the races were run off with satisfaction to the spectators and without any obtrusive complaint by the participants.

Tbe track owners had probibited oil being used. "Glutrin," a by-product of wood-pulp, was employed with highly satisfactory results in retarding the dust. Stereopticon bulletins, adding machines for the scorers and a strident electric horn for starting and warning were among the novelties introduced. The officials and newspaper men were well cared for over night, a dormitory and restaurant having been established in the clubhouse to offset the closing of the nearby Brighton Beach Hotel.

There were few men of prominence in the racing world on the official stand. Robert Lee Morrell was a referee, S. M. Butler and A. L. McMurtry were among the timers, Tom Moore essayed to masquerade as a "wag" pro tem. with the starter's flag, and Charley Earl was an announcer.

It had been heralded during Friday afternoon with much flourish of trumpets that President Roosevelt had consented to start the race by 'phone. Eight o'clock, the hour set for the start, approached and but two or three cars were at the tape. It came and no start. Perhaps Mr. Roosevelt had not finished his coffee, was the surmise of the expectant crowd. Not so. The Allen-Kingston camp had been given grace to repair a bent axle incurred in an afternoon sprint race. Half an hour later, however, the 11 contestants were lined up, six in the front and five in the back row. At 8:30 o'clock sharp Tom Moore pressed a button at the end of a long wire and the siren shrieked a shrill signal for the start. Whether President Roosevelt was at the other end of the judges' stand telephone wire the announcer failed to make known. With the press agent's proud paragraph in the late editions of the evening papers the incident perhaps may have been closed. There was an exciting scramble around the first turn and a mad scamper down the backstretch, from which Laurent evolved with the Stearns as leader of the first mile in 1:20. Mulford took the lead the next lap. The pace was fast and the changes were frequent. George Robertson, with whom a reckless gait is characteristic, was prominent in the sprinting and at 20 miles was in the lead with the Simplex in 25:26, and still in front at 25 miles in 31:40. Then Mulford took up the running with the Lozier "six," and led all the way past 50 miles—thirty in 37:51, thirty-five in 44:03, forty in 50;19, forty-five in 56:15, and 50 in 1:02:15, pursued in order by Michener in the Lozier "Four," and Parker in the Fiat.

Loziers Lead During First Hour.

Lozier No. 1 and No. 2 led in this order at the end of the first hour, with 48 miles to their credit. The Allen-Kingston, Renault, Stearns, and Fiat were tied two miles behind. The running the

first hour was four miles behind the De Dietrich's record, of 52 miles, made in the last Morris Park race.

The exciting all around racing, with gleaming headlights flashing around the turns, scurrying in a mask of electric flames down the homestretch, swinging recklessly around the bend, and speeding with red taillights marking their flight of the backstretch, got and kept the great crowd agoing with constant cheers for sharp brushes and encouraging cries to their favorites. This night racing is, indeed, an inspiring and weird spectacle, well calculated to arouse a thrill and a hurrah in even a cold-blooded cynical race follower. It was a splendid struggle this fight for the lead. It grew even hotter in the second hour. Lozier No. 1, Simplex and Allen-Kingston were having a neck-and-neck three-cornered fight. They finished the second hour even with 101 miles each and tied the record made by the Simplex at Morris Park. The excitement was continuous and the expectation of something going wrong with the contestants at any moment kept the spectators constantly on the *qui vive*.

Simplex, Robertson Driving, which at One Time Figured Dangerously as a Probable Winner.

Renault Meets with Disaster.

Before the second hour was little more than half way through the contingent of the crowd whose interest lay mainly in the possibilities of smashed cars and broken bones, got their money's worth in the first and only accident of the race. It put the Renault out of the race and its crew in the hospital. The S. P. O., a 16-horsepower taxicab chassis, with racing body, and another car, blocked the way of the Renault on the backstretch through being too far out from the pole. Paul Sartori, who was at the wheel of the Renault and has a reputation for recklessness, tried to cut through on the inside, struck the taxicab, and deflected his own car through the fence. His car was upset and completely wrecked. Sartori's arm was broken in two places, and his mechanic, Rene Gaurand, sustained severe scalp wounds. They were cared for in the hospital tent, later taken in an ambulance to the Coney Island emergency hospital, and the next day were removed to a New York hospital. It took nearly four hours to repair the S. P. O., which did not again take up the running until the sixth hour.

In the third hour the triple tie was broken by the Simplex and Allen-Kingston cutting away from Michener and having a battle royal of their own for the leadership. It was a hard fought scrap, in which Robertson finally prevailed and secured a three-mile lead over Rippigill. Michener chased the pair a mile in the rear. The Simplex was now tied with Lozier's 193 mile record for four hours at Morris Park.

In the fifth hour George Robertson set a whirlwind pace, covering 52 hours, scoring a new record, 245 miles against 237, the former figures. From this point on the leaders kept well ahead of the Morris Park figures. The Allen-Kingston had faltered and let Michener by with the Lozier, which, however, was six miles behind the Simplex. Robertson kept at it hammer and tongs the sixth hour. Michener dropped back into the ruck and the Allen-Kingston once more became the runner up. Mulford now began his fine work, which finally made the Lozier "four" a mere running mate for second place honors, and at the end of the hour was installed in third place.

Robertson Spoiled Simplex Chances.

In gaining and maintaining the lead Robertson had driven a reckless race utterly unmindful of any possibility of fuel exhaustion. His punishment came through the water giving out. A dry radiator and two cracked cylinders practically destroyed all chances the speedy Simplex might otherwise have had. The end of his long sprint came at 2.35 A. M., when the seventh hour had hardly begun. It took nearly three hours to put in new cylinders, and when Robertson appeared on the track again in the ninth hour he was far back in the ruck in eighth position.

All this time the triple winner of 1908, Louis Strang, had been lost so far back in the ruck that he was forgotten by the spectators, who had interest only for the heroes of the present. Strang had taken his seat in the Acme with practically not even a trial

In the Backstretch Occasionally the Cars Bunched and Made it Most Interesting.

President C. F. Wyckoff.

"Outlaws" Morrell, Hollander, and Butler.

Tom Moore and Announcer Earl.

of the car. It was not until the fourth hour that the car was gotten into fair running shape. Barring the S. P. O. and the Garford the Acme was then at the tail end of the procession. It was in no shape, however, to show better than a 40-mile an hour average to the end of the race.

With the retirement of the Simplex with its cracked cylinders, the Allen-Kingston became the most conspicuous performer. For three hours it held a lead of from 6 to 12 miles over the Lozier "Six," scoring 50 miles in the eighth hour. Toward the close of the ninth hour, however, the leader met its Waterloo just as the Simplex had before it. A broken radiator, said to have been caused by a flying stone, put it out of the running long enough to ruin its chances. It took an hour to put in a new radiator, and when Rippigill again entered the race the Allen-Kingston found itself in fifth position.

Mulford Takes Lead and Holds It.

While the A.-K. was in camp Mulford grabbed the lead, which the Lozier "Six" held tenaciously to the end of the race. The Fiat flashed into second place and Michener held to third like a bull dog. The Fiat held stubbornly to second place from the tenth to the end of the fifteenth hour, when it lost it to Michener and never regained it thereafter, the trio running in the order of their finish to the end.

There was a halt called on the race at half past one o'clock on Saturday afternoon that the track might be watered, and two or three time killing events be run so that there might be a late finish to catch a Saturday-night crowd, the advertisements having promised that the end would not come until late in the evening.

At 3 o'clock the race was resumed. The mishaps of the Simplex and the Allen-Kingston had left them in fifth and sixth positions, respectively. Ralph de Palma had taken the wheel of the Allen-Kingston and George Robertson still pluckily stuck to the seat of the Simplex. The duel of these rival drivers and cars was the feature of the last hours of the race. Robertson, however, finally won out in the duel, made up his 50 miles, and won out by a couple of laps. In the eighteenth hour he scored 51, and in the nineteenth 54 miles, a total of 105 miles in two hours, which comes pretty close to being a track record.

The Stearns drivers, Laurent and Marquise, for the first time in the race gave the Stearns its full head and stalled off the Simplex and Allen-Kingston from overtaking them.

Those Stops for Unlighted Tail-lamps.

During Saturday evening Mulford was stopped frequently by the officials on account of the tail-lamps of Lozier No. 4 being out. It cost the car a lot of lost time. During Friday evening, by the way, the Fiat was stopped several times for the same reason. In fact, the bunch at one time made six circuits of the track while the Fiat was engaged in argument and relighting in front of the stand. Some official called to the timers to score the Fiat with the bunch. The next day W. E. Scarritt, then acting referee, heard of this and ordered six miles to be deducted from the Fiat's score.

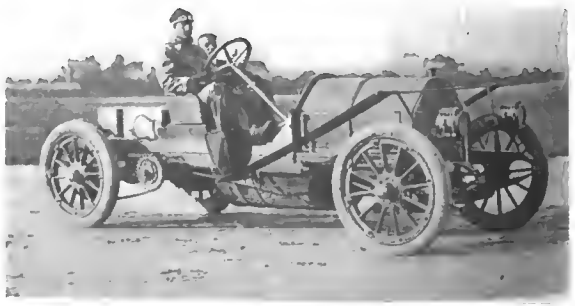
The Thomas "Forty," a six-cylinder stock car, which had been put in practically for a demonstration, made good with a steadily maintained average of about 40 miles an hour. Its troubles were few. The Garford had bad luck and was held up in camp at one time for 6½ hours at a single stretch.

The Loziers received an ovation at the finish, the crowd rushing on the track to greet the winner to the great danger of being run into by the cars, which Tom Moore was frantically striving to bring to a halt by waving a red lantern.

24-Hour Racers Mechanically Considered.

The result was a clean-cut victory for the Lozier in its securing both first and second places. Moreover, the winner was a six-cylinder car, the first ever entered in a race of this length. It was rated at 50-horsepower, with cylinders of 4 5-8 inch bore by 5 1-2 inches stroke. Mulford's four-cylinder car has cylinders 5 1-4 inches "square." Both motors follow the usual Lozier design; cylinders cast in pairs and covered with pearl gray enamel; valves on opposite sides; crankshaft forged from chrome-nickel steel, running on ball bearings. Both have multiple disc

Re-start on Saturday After Repairing Track.



Marquise and the Stearns Performer.

clutches and four-speed selective change-gears with direct drive on third speed. Drive to the rear axle is through a shaft with a single universal joint, housed in a tube which acts as a torsion rod. All wheels are 36 inch with 4-inch front and 4 1-2-inch rear tires, of Continental make. The wheelbase of the six-cylinder car is 131 inches and of the four-cylinder 124 inches. One detail which showed the careful preparation of the cars for the race was the arrangement of the taillights, which were enclosed in the rear part of the body work, with only the red bull's-eyes showing. Bosch was the magneto used.

The Fiat driven by Capra and Parker took third place, showing good speed and losing little time in the paddock. Its motor develops 60 horsepower, with cylinders 140 by 135 millimeters (5.52 by 5.32 inches) and, of course, cast in pairs with opposite valves. It was the only car in the race using low-tension ignition, the current being generated by a Bosch magneto. The change-gear gives four speeds, operated selectively, and drive is through side chains.

Laurent's Stearns No. 4 was another consistent performer and was always well up in the list. Its four-cylinder motor has cylinders cast in pairs, 5 3-8 by 5 7-8 inches, with both inlet and exhaust valves on the left side actuated from one camshaft. One notable feature is the double-jet carbureter, which accounts for the otherwise rather ambiguous rating of 30-60 horsepower. Stearns also departs from established standards in the use of an expanding band clutch. Gear change is by the usual four-speed selective system and drive through side chains. The wheels are shod with 36x4 and 36x4 1-2 inch Continental tires.

The Simplex was admittedly the fastest car on the course, and was also the highest powered, its four cylinders being 5 3-4 inches "square." They are cast in pairs with opposite valves, and drive is through a four-speed selective gear and double chains. The wheelbase is 126 inches.

Allen-Kingston was of lower power than any of the cars which finished ahead of it, but managed to hold its own fairly well. The dimensions of its cylinders are 5 by 5 1-2 inches, and the design follows accepted standards. The clutch, however, is rather unusual, consisting of only five discs, alternate steel and bronze. Drive is by shaft to the live, floating rear axle.

Strang's Acme was a stripped six-cylinder roadster, with cylinders cast separately; ignition by Eisemann magneto and batteries, with two sets of plugs. Another six-cylinder contestant was Montague Roberts' Thomas. The S. P. O. is a newcomer to the American trade, and there was much uncertainty as to its origin. It is made by the French Société de Petit Outillage, and is only of 16 horsepower. The Garford 40, which suffered from various troubles, and Sartori's unlucky Renault are both stock cars of familiar designs.

Another Race Will Be Held.

Following the big race came a challenge and an acceptance and with them the chance of a sweepstake being embodied in the next 24-hour contest, which is announced for October 2-3. Paul La Croix was naturally a bit crestfallen at the Renault being put out of the race by an accident so early as to cut off the car's chances of repeating or bettering the record performance of this make at Morris Park. He accordingly issued a challenge to any competitor in a future race to put up $1,000 against his entry. Charles Singer, entrant of the Simplex, which held the lead for several hours in record time early in the contest, was quick to respond with an acceptance and suggestion that the third and fourth cars be also invited to compete in the sweepstakes.

Short Events Were Mediocre.

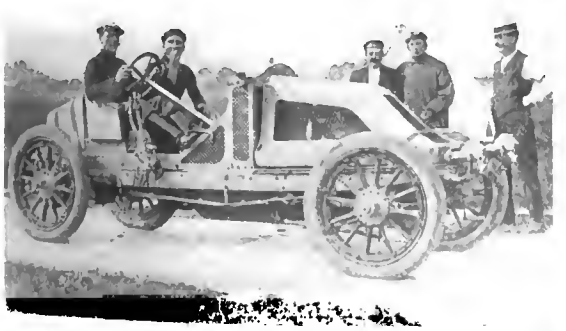
As usual a program of sprints was run the afternoon prior to the start of the big race, but they did not pan out over well. There were few entries and the waits between were tediously prolonged.

HOW THE BATTLE FOR THE LEAD WAS WAGED.

Hour	First		Second		Third		Former Record
1	Lozier No. 1...	48m	Lozier No. 2...	48m	Allen-K'gston.	46m	52m
					Renault.....	46m	
					Stearns.....	46m	
					Fiat.....	46m	
2	Lozier No. 1...	101m	Allen-K'gston.	101m	Simplex.....	101m	101m
3	Simplex.....	146m	Allen-K'gston.	143m	Lozier No. 1...	142m	146m
4	Simplex.....	193m	Allen-K'gston.	192m	Lozier No. 1...	191m	193m
5	Simplex.....	245m	Lozier No. 1...	239m	Allen-K'gston.	235m	237m
6	Simplex.....	294m	Allen-K'gston.	284m	Lozier No. 2...	279m	286m
7	Allen-K'gston.	332m	Lozier No. 2...	320m	Stearns.....	313m	316m
8	Allen-K'gston.	382m	Lozier No. 2...	371m	Lozier No. 1...	359m	362m
9	Allen-K'gston.	423m	Lozier No. 2...	417m	Fiat.....	411m	408m
10	Lozier No. 2...	465m	Fiat.....	462m	Lozier No. 1...	458m	457m
11	Lozier No. 2...	515m	Fiat.....	506m	Lozier No. 1...	504m	504m
12	Lozier No. 2...	565m	Fiat.....	556m	Lozier No. 1...	552m	553m
13	Lozier No. 2...	616m	Fiat.....	605m	Lozier No. 1...	601m	600m
14	Lozier No. 2...	664m	Fiat.....	650m	Lozier No. 1...	646m	650m
15	Lozier No. 2...	706m	Fiat.....	693m	Lozier No. 1...	691m	699m
16	Lozier No. 2...	755m	Lozier No. 1...	740m	Fiat.....	724m	746m
17	Lozier No. 2...	803m	Lozier No. 1...	781m	Fiat.....	771m	787m
18	Lozier No. 2...	849m	Lozier No. 1...	825m	Fiat.....	815m	826m
19	Lozier No. 2...	883m	Lozier No. 1...	870m	Fiat.....	860m	871m
20	Lozier No. 2...	928m	Lozier No. 1...	914m	Fiat.....	903m	909m
21	Lozier No. 2...	972m	Lozier No. 1...	960m	Fiat.....	950m	951m
22	Lozier No. 2...	1016m	Lozier No. 1...	1005m	Fiat.....	993m	995m
23	Lozier No. 2...	1060m	Lozier No. 1...	1048m	Fiat.....	1039m	1032m
24	Lozier No. 2...	1107m	Lozier No. 1...	1092m	Fiat.....	1074m	1079m

SUMMARY OF THE BRIGHTON BEACH 24-HOUR RACE, SEPTEMBER 11-12, 1908.

Order of Finish	CAR	Drivers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	LOZIER	Mulford and Cobe	48	99	139	185	232	279	320	371	417	465	515	565	616	664	706	755	803	849	883	928	972	1016	1060	1107
2	LOZIER	Michener and Lynch	48	101	142	191	239	275	312	359	406	458	504	552	601	646	691	740	781	825	870	914	960	1005	1048	1092
3	FIAT	Capra and Parker	46	99	137	184	230	273	312	364	411	462	506	556	605	650	693	724	771	815	862	907	950	993	1039	1074
4	STEARNS	Laurent and Marquise	46	97	136	184	231	270	313	353	398	433	474	522	570	620	659	701	746	784	835	880	923	966	1008	1050
5	SIMPLEX	Robertson and Lescault	45	101	146	193	245	294	296	296	310	361	413	460	505	553	599	647	695	746	800	846	892	938	982	1029
6	ALLEN-KINGST'N	Rippigill and De Palma	46	101	143	192	235	284	332	380	423	430	478	523	570	619	657	699	745	789	835	865	906	932	982	1027
7	ACME	Strang and Rodgers	29	42	65	108	157	194	240	289	332	375	418	465	514	557	591	631	676	703	749	792	835	879	927	976
8	THOMAS	Roberts and Martin	40	86	122	162	203	237	278	316	356	396	437	478	518	561	605	651	691	728	768	804	840	877	918	955
9	S.P.O.	Kjeldsen and Juhasz	36	55	55	55	55	60	98	136	166	202	243	278	313	351	389	402	413	443	483	500	533	569	602	635
10	GARFORD	Vantine and Daty	33	33	41	54	83	83	83	83	83	83	93	138	183	220	263	303	318	318	323	344	375	387	387	387
11	RENAULT	Sartori and Clement	46	64	Ran into fence and retired.																					



Paul Sartori (Renault) Who Later Went Through Fence.

A View of the Infield from the Grand Stand.

PARKWAY TO BE OPENED WITH SWEEPSTAKES

INSTEAD of the elimination trials for the Vanderbilt Cup which were planned to be held on Long Island on October 10 next, the Vanderbilt Cup Commission has decided to substitute a fitting celebration to mark the opening of the Long Island Motor Parkway. The event to be held will be known as the Long Island Motor Parkway Sweepstakes, and owing to the unusual and unequalled facilities offered by the course, the race will be marked by features hitherto impossible in connection with automobile speed events. Cars of every class, selling from $1,000 up will be eligible to compete, and unlike any previous event of the kind, they will all be started at once. Owing to its novelty and the fact that makers are anxious to try out their 1909 models in competition with those of their competitors, it is thought that there will be fully 75 entries.

Joseph Tracy in His Locomobile, Making 95 Miles an Hour on the Parkway.

Another unusual feature of the event is to be found in the fact that the daylight start of bygone days will be abolished, the cars not being sent away from the line until 9 a. m. The 25-mile circuit laid out for the Vanderbilt cup race will be employed, the larger cars making ten laps, or a distance of 250 miles, while the smaller machines will be required to go from four to eight laps according to their selling prices. It is easy to realize the spectacular possibilities of an event in which such a large number of cars will be running round a 25-mile circuit, and there certainly should be no long waits at the grand stand, while close brushes past it will doubtless be frequent. In fact the excitement there should be continuous, and quite in contrast with former events, as up to this time it has been impossible to start a large number of cars at once.

On the date in question they will be sent away in lots, or with an interval of 30 seconds between, and as the 11-mile stretch of cement parkway offers unrivalled speed facilities, the competing drivers will be able to get out of one another's way soon after leaving the stand. The grand finish will be for the high-powered cars only, as they will go the entire distance of 250 miles, making ten laps of the circuit. Cars selling under $2,000 will only be required to go four laps, while those listing between $2,000 and $3,000 will have to make eight laps; those selling above $3,000 will have a chance to be in at the finale of the day.

Although the entrant must furnish evidence that the machine entered is of a type to be produced during 1909, or one that has been produced in quantities during the past season, the Cup Commission has offered the manufacturer more liberal conditions than have ever been granted in any stock touring car event. Touring cars, as well as all other machines, may be completely stripped and put into racing form, even including the use of special racing gear ratios, the removal of guards, mufflers and other impedimenta to a racing car being permitted. Where mufflers are carried, the only restriction concerning them is that they shall not be pointed toward the ground.

The grand stand, which is being built for the Vanderbilt cup race, to be held over the same course on October 24, will be completed in time for the Motor Parkway Sweepstakes and the Long Island Railroad and trolley special service will be running in full force, the same as on the day of the big race two weeks later. The cup circuit is now in practically complete condition, all the bridges crossing intersecting highways being up, while the oil for the State and county roads connecting the two ends of the 11-mile stretch of the cement parkway has now been received and will be utilized to make this part of the course dustless. An elaborate telephone system for signaling the timing and reporting the positions of the cars on the various parts of the course has been installed. Boxes and seats in the grand stand are now on sale and may be had from Jefferson De Mont Thompson, chairman of the Vanderbilt Cup Commission, at the headquarters of the American Automobile Association, 437 Fifth Avenue, New York.

Entry blanks are now out for the Motor Parkway Sweepstakes, the preliminary announcement of the various classes, for which $5,000 in prizes are offered, being as follows:

Class No. 1: Motor Parkway Sweepstakes.—For cars selling above $4,000. Entry fee, $150 for each car. Cash or plate prize to the winner of $1,000. Distance, ten laps of the circuit.

Class No. 2: Meadow Brook Sweepstakes.—For cars selling over $3,000 to $4,000. Entry fee, $125 for each car. Distance, ten laps of the circuit. Cash or plate prize of $1,000 to the winner.

Class No. 3: Garden City Sweepstakes.—For cars selling from $2,001 to $3,000. Entry fee, $100 for each car. Distance, three laps of the cup circuit. Cash or plate prize of $1,000 to the winner.

Class No. 4: Jericho Sweepstakes.—For cars from $1,001 to $2,000. Entry fee, $75 for each car. Distance, six laps of the cup circuit. Cash or plate prize of $1,000 to the winner.

Class No. 5: Nassau Sweepstakes.—For cars selling for $1,000 or under. Entry fee, $50 for each car. Distance, four laps of the cup course. Cash or plate prize of $1,000 to the winner.

WHY FAIRMOUNT SANCTION WAS GRANTED.

PHILADELPHIA, Sept. 14.—The 200-mile "Founders' Week Stock Chassis Road Race" is assured. It will be pulled off Saturday, Oct. 10, between the hours of 6 and 11 A. M., over a 7.8-mile course in Fairmount Park. The Park Commissioners have coupled the permit with a number of conditions but all of them are reasonable and will be gladly complied with by the Quaker City Motor Club. Besides granting the permit for the actual race, the commission adopted a resolution that, "under the conditions of the request, automobilists who propose entering the race shall be permitted to practice daily over the route for one week prior to the race between 7 A. M. and noon every day."

A fraction over 25 circuits of the 7.8-mile course will be necessary to complete the 200 miles, but it is likely that the committee will make it an even 25 times around—195 miles.

In the argument that preceded the final granting of the permit, Commissioner James Pollock made the somewhat surprising statement that during the past year the records showed that more automobiles had entered the park than horse-drawn pleasure vehicles. "We must, therefore, give consideration to the motor car," he said.

At the Comfortable Base of Wilbraham Mountain. Start of the Springfield Club's Mile Climb.

KNOX WINS MOST HONORS IN WILBRAHAM CLIMB

SPRINGFIELD, MASS., Sept. 11.—Springfield, home of the Knox and Stevens-Duryea, famed in days gone by as the arena of the world's biggest bicycle meets and the scene of the most famous exploits awheel of its great cycle champion, George Hendee, now a leader in another branch of the motor vehicle industry, well sustained to-day the sporting reputation of the old town by the successful promotion of one of the best hill climbs and most difficult up-grade tests yet credited to New England.

In Wilbraham Hill the Automobile Club of Springfield has a proposition well worthy of attack by the most ambitious hill-climbers. It is a sheer ascent of a mile, that goes straight up the side of the mountain with grades varying from 6 to 25 per cent. They made the most of it by good management and setting forth a well conceived program that gave golden opportunities to all classes of cars were they segregated by piston area or by price.

At the lowest estimate 7,000 spectators gathered to see the climb. No less than 800 automobiles lined the road and at that scores of machines were unable to obtain parking spaces.

Charles Basle, who won record-breaking fame at Ormond and on several circular tracks and is to be a pilot in the coming Vanderbilt Cup race, carried off the time honors of the day in the 48-50 Knox "sportabout" he is to drive in the Long Island classic. Arousing the wildest enthusiasm over his skill and daring, Basle made the steep mile ascent in 1:08, a rate of but a fraction under 53 miles an hour.

There was but one driver and one car at the climb that gave any promise of equaling or beating this time, and that was the unfortunate Robinson with the Stevens-Duryea "Big Six." While taking the hill at a terrific gait in an attempt to lower Basle's record his car skidded three times across the course at the first parking ground and struck a boulder which shattered the right rear wheel. The car turned somersaults and Robinson was thrown 50 feet to the roadside below. Fortunately he escaped with no more injury than a broken leg and painful bruises. After that Basle's time was never in danger.

The accident had a notable effect on risks taken by the other contestants, resulting in comparatively slow time made in the following events. Baldwin in his Stanley steamer made an unsuccessful attempt to lower Basle's time. Like the other drivers, especially of the lighter cars, however, he recognized the danger of the abrupt turns and grades. In his trial he made the climb without full steam, his momentum being great enough to carry him from the foot well up the hill. Then he opened his throttle again for a final dash for the tape. His time was 1:11 2-5, which placed him in the fastest class.

The fastest time of all motor vehicles was made by Stanley Kellogg on a 7-horsepower Indian motorcycle, 1:03 4-5. In the event for gasoline cars selling for $4,000 and over, the Stevens Big Six established a mark of 1:10 1-5, which stood for some time. The climb for cars of from 24.1 to 40 horsepower inclusive was the closest and most interesting contest of the day. Hancock with a Stevens Little Six got away with first place rather easily in 1:22 3-5, but Knox, Buick and Chalmers-Detroit had a hot fight for the next position. They finished in the order named, but with only a fifth of a second between each one.

In the class for cars with piston area of 90 and over, Robinson and his Big Six covered the course in 1:09 4-5. When he came over the level stretch after leaving the first grade he was going over 70 miles an hour, and as he turned the course on the 23 per cent. grade his car slewed across the road and the rear wheel cut into the bank, throwing dirt and stones 30 feet into the air. Yet he held to the road and received a great ovation at the finish.

Half Way Up the Mountain There Is a Level Stretch, and Here Many Onlookers Naturally Congregated.

Basle and Knox Fastest Performer.

Bourque and the Second Knox Winner.

Enthusiasm was at a high pitch now, and when in the gasoline free-for-all Basle whirled up the grade and around the turn on two wheels in 1:08, bedlam broke loose and for fully fifteen minutes the crowd yelled and cheered. Bourque, in a 38-40-horsepower Knox, added to the tumult by another wild dash up the hill in 1:09 4-5. Still Robinson was looked to for faster time. Hopes were dashed to the earth and joy changed to sympathy when his run was ended at the first quarter-mile by the accident that crippled him and ruined his car.

Borque won second place in the "record of the hill" climb by negotiating the course in 1:09 3-5. Basle went over the course again in 1:12 flat, not attempting to beat his former time. Baldwin, in the Stanley, cut this down three-fifths of a second. As he came up the roughness of the course jolted him time and time again from his seat. His car bounded rather than rolled, and faster time would have ditched him without much doubt.

The club spent considerable money in preparing the hill for the contest, but at that it was a little too rough for great speed. So great was the success of the meet from a popular standpoint, however, that it will probably be repeated next year, and in that case the club will spare no effort to get the road in the best possible condition. The management could not have been improved on and the club committees deserve the highest credit for their work.

OPEN TO ALL GASOLINE CARS.

1.	Knox	48.8	Basle	1:08	
2.	Knox	38.8	Bourque	1:09 4-5	
3.	Stevens-Duryea	35.	Hancock	1:16 1-5	
4.	Stevens-Duryea	54.1	Robinson	Car overturned	

RECORD OF HILL, OPEN TO CARS OF ALL TYPES AND MOTIVE POWER.

1.	Knox	30.06	Bourque	1:09 3-5	
2.	Stanley Steamer		Baldwin	1:11 2-5	
3.	Knox	48.08	Basle	1:12	

GASOLINE CARS SELLING FOR $4,000 AND OVER.

1.	Stevens-Duryea	54.1	Robinson	1:10	

GASOLINE CARS SELLING FROM $3,001 TO $4,000.

1.	Stevens-Duryea	35	Hancock	1:23 2-5	

GASOLINE CARS SELLING FROM $2,001 TO $3,000, INCLUSIVE.

1.	Knox	38.8	Bourque	1:26 3-5	

GASOLINE CARS SELLING FROM $1,251 TO $2,000, INCLUSIVE.

1.	Jackson		E. P. Blake	2:01 4-5	

GASOLINE CARS SELLING FROM $851 TO $1,250, INCLUSIVE.

1.	Buick	22	R. Burman	2:12 4-5	
2.	Cameron	16	E. E. Cameron	2:17	

GASOLINE CARS SELLING FOR $850 OR LESS.

1.	Cameron	16	E. E. Cameron	2:34 3-5	
2.	Middleby		W. E. Smith	5:17 1-5	

GASOLINE CARS WITH PISTON AREA OF 90 AND OVER.

1.	Stevens-Duryea	54.1	Robinson	1:09 4-5	

GASOLINE CARS WITH PISTON AREA OF OVER 55 SQUARE INCHES.

1.	Stevens-Duryea	35	Hancock	1:18 3-5	
2.	Knox	38	Hedstrom	1:28	

GASOLINE CARS WITH PISTON AREA OVER 50 SQUARE INCHES AND UNDER 55.

1.	Knox	30.05	Dennison	1:40	
2.	Cameron	24	E. E. Cameron	2:11 4-5	

GASOLINE CARS WITH PISTON AREA OF 50 SQUARE INCHES AND UNDER.

1.	Atlas	34	Ray Phelon	2:34 3-5	
2.	Bailey Speedster		Bertram Bailey	4:00 2-5	

GASOLINE CARS WITH 40.1 TO 50 HORSEPOWER, INCLUSIVE.

1.	Stevens-Duryea	54.1	Robinson	1:10 1-5	

GASOLINE CARS WITH 24.1 TO 40 HORSEPOWER, INCLUSIVE.

1.	Stevens-Duryea	36	Hancock	1:22 3-5	
2.	Knox	30.06	Dennison	1:35 2-5	
3.	Buick	38.8	R. Burman	1:35 3-5	
4.	Chalmers-Detroit	40	Oliver Light	1:35 4-5	
5.	Bailey Speedster		Bailey	2:26 1-5	

GASOLINE CARS WITH 15.1 TO 24 HORSEPOWER, INCLUSIVE.

1.	Cameron	16	E. Cameron	2:15 1-5	
2.	Buick	22	R. Burman	2:24 3-5	

CARS OWNED BY MEMBERS OF THE AUTOMOBILE CLUB OF SPRINGFIELD, ALL TYPES AND MOTIVE POWER.

1.	Stanley Steamer	30	H. C. Knudson	1:23 4-5	
2.	Knox	38	O. Hedstrom	1:39 3-5	

OPEN TO ALL GASOLINE STOCK CARS

1.	Stevens-Duryea	36	Hancock	1:22	
2.	Knox	30.6	Dennison	1:36 3-5	

MOTORCYCLES WITH 30.5 CUBIC INCHES IN CYLINDER CAPACITY AND UNDER.

1.	Indian		Chas. Gustafson	1:24 4-5	
2.	Indian		Stanley Kellogg	1:29 2-5	
3.	Indian		H. B. Lake	1:50	

MOTORCYCLES WITH 61 CUBIC INCHES IN CYLINDER CAPACITY AND UNDER.

1.	Indian	7	Stanley Kellogg	1:03 4-5	
2.	Indian	7	Chas. Gustafson	1:09 3-5	
3.	Indian	7	H. B. Lake	1:13 2-5	
4.	N. S. U.	7	E. A. Shotwell	1:22 4-5	

"Pete" Robinson and Stevens-Duryea "Big Six."

Hancock and Stevens-Duryea "Little Six."

WHY THE LONG STROKE FOR MOTORS?

By S. F. EDGE.

IN view of the present great interest that is being taken in the very incomplete R. A. C. formula for rating motors, it seems to me it is worth consideration why competitors in racing motor car events have started developing the long-stroke engine. Ordinarily commercial engines have got down to a reasonable proportion between stroke and bore, in fact, I think every up-to-date motor car maker was considering quietness, smoothness of running and economy in tires and mechanism almost before everything. Then the Royal Automobile Club of England, and the Automobile Club of France both suddenly started rating engines for competitive purposes by the size of the cylinders only. The result of this was that the far-seeing manufacturers, who understood their business, at once realized that these two clubs had brought out a formula which placed no restriction on stroke. Experiments were at once carried out, and it was then found that increasing the length of the stroke was almost as good as increasing the bore.

In developing the formula, diameter of cylinders squared multiplied by number of cylinders, divided by 2.5, the compilers of the formula no doubt assumed that long stroke motors would be run at slow speed, or in other words, the speed would be inversely proportioned to the length of stroke, and that the limit to speed and stroke (that is to say, piston speed), would be the strength of the moving parts.

This, however, is not the limiting factor, for it is possible to make these parts of material of such excellent quality, which, correctly disposed within the parts, ensures that their actual strength is much greater than the stress which they are called upon to withstand, with the motor running at maximum speed. There are two chief factors which limit the engine speed:

(1) The actual rubbing velocity of the pistons within the cylinders.

(2) The rapidity of actuation of the valves, and the speed with which the gases can be taken in and expelled from the cylinders.

With the piston speeds at present in vogue, even in races where they are maintained at the highest limit, it is possible to get over the piston lubrication difficulty by judicial lubrication at the expense of a smoky exhaust. The second factor, therefore, is the chief limitation so far as the engine speed of racing motors is concerned.

There are other factors which limit the speed, such as the rate of ignition, inflammation, and combustion of the gases, the speed of the ignition apparatus, etc., but the effect of these things is not so great as those above-mentioned. The rapidity of actuation of the valves does not depend upon the length of stroke of the motor, but since the speeds of motors of different strokes but of the same bore, have been found to be practically the same, it follows that the powers are approximately proportional to the length of the strokes. Racing motors which have a limited piston area, and from which it is desirable to obtain the maximum power, have, therefore, to be fitted with excessively long strokes.

The formula rates a motor with a short stroke the same as one with a long stroke, provided the piston area is the same in both, and although the performance of the long stroke motor, so far as actual H. P. is concerned, is undoubtedly better than the one with the short stroke, yet by rating their performances should be similar. Actual experience teaches that the formula does not give a true rating, and if the rating is to be a measure of the H. P. developed, the length of stroke must be introduced into the formula. It seems so very simple to have a formula which takes into account stroke, and I do think that whatever formula is selected it should be reasonably near the actual brake horsepower that the particular engine being calculated should give, if it was a modern, efficient, commercial engine.

The calculation of the power of an engine must necessarily be based upon the force behind the piston and the speed at which it moves, whatever means are taken to express this; that is to say, we have three factors which it is necessary to ascertain before the power of an engine can be calculated, namely, the area of the piston, the pressure per square inch to which this area is subjected, and the number of feet through which the piston moves in one minute. It is obvious that it is only on the first of these three that definite limits can be put, and that any limits selected for the other two figures must be purely arbitrary and liable to require revision from time to time, the only alternative being to measure them on each individual engine. It seems to me that this would be too big a task to be undertaken for general purposes, and that the simplest way is to select what is known to be a fairly high average in each case. This would mean that designers would be stimulated to raise these figures to the greatest possible extent.

If we start with the usual horse power formula $\frac{P \times A \times S}{33000}$

where P = mean effective pressure in lbs. per square inch.

$A = 11$ times $\frac{D^2}{4}$ = area of piston.

$S = L + N + 2$ = piston speed in feet per minute where

L = length of stroke in feet and

N = number of revolutions per minute

the simplest way is to boil it down by obtaining a constant from all the known or arbitrarily selected figures by which the variables can be multiplied or divided. To illustrate this, I assume mean effective pressure of say 80 lbs. per square inch, and a piston speed of say 1400 feet per minute; we then get the following formula from the above:

$$\frac{P \times L \times N \times 2 \times 11 \times D^2}{4 \times 4 \times 33000}$$

Assuming a square engine, say 5" x 5" a piston speed of 1400 feet per minute would involve a speed of 1680 revolutions per minute, the formula therefore becomes:

$$\frac{80 \times L \times 1680 \times 11 \times D^2}{2 \times 4 \times 33000} = L \times D^2 \times 1.6 \text{ the result}$$

being the horse power of one cylinder. Assuming a 5" x 5" engine, this formula gives 16.5 H. P. per cylinder, a figure quite easy to obtain, but assuming the stroke increased to 7" the formula gives 23 H. P. On the other hand, for a 4" stroke 13.3 H. P. is obtained. The difference in horse power between the extremes in this formula seems to me rather great, and possibly would tend to too much restrict the permissible variation in stroke. The way to correct this would be to use the square root of the stroke as a multiplier and suitably reduce the constant; this gives us the following formula:

$$2 L \times D^2 \times 1 = \text{H. P.}$$

This gives us for a 4" stroke cylinder 14.25 H.P. for a 5" 16-H.P., for a 6" 17.5-H.P., and for a 7" 18.9-H.P. These proportions are in accordance with practice. At the same time, the variation between the extremes should be sufficient to restrain designers from adopting extremely long or extremely short strokes. The reasons for wishing to handicap the long-stroke motors lie in the motors themselves. They present many difficulties, and are not so well adapted for driving motor cars as are engines with shorter strokes.

The chief objection to excessively long strokes are: (1) Size of engine, (2) vibration, (3) weight of engine, (4) noise from engine, (5) lack of flexibility, (6) difficulty of starting, (7) danger from pre-ignition, (8) necessity for stronger shafts, etc., in transmission gear, (9) increased wear and tear on tires.

(1) **Size of Engine.**—Long stroke engines must have proportionately long connecting rods, and on this account the distance from the center of the crank to the top of the cylinders is considerable, and the oil base must also be very deep to allow for

the swing of the crank. In order to get sufficient clearance it is necessary to carry the crankshaft higher in the frame, which necessitates raising the gearbox, clutch and other parts. This raises the center of gravity of the car considerably and thus it is more easily overturned and skids more readily. The engine, being built very high, necessitates a higher dashboard and bonnet, and the seats must therefore be raised to give a clear view, which also raises the center of gravity of the car. The larger crankcase occupies space usually taken up by the magneto, water pump, etc., and these have to be placed in more restricted positions, where they are less accessible.

(2) **Vibration.**—However well balanced an engine may be, there is always a slight amount of vibration. This need not be very much with short stroke motors, but with excessively long strokes it becomes very serious. It is due to the inertia forces of the reciprocating parts causing the crankcase and crankshafts to distort and "whip," and in addition to the discomfort of riding in the car there is the grave danger of the crankshaft breaking through fatigue due to the vibration.

(3) **Weight of Engine.**—Excessively long-stroke motors are exceedingly heavy. They are very high, the crankcases are very large to accommodate the swing of the crank, the valves must be large, so as to allow the large quantity of gas easy ingress and egress, and the valve ports, pipes, cylinder heads, etc., must be in proportion. The reciprocating parts must be made heavier than those for equal bore short-stroke motors. It is also necessary to employ a heavier design of crankcase and oil base, in order to make these strong enough to withstand the stresses due to high speeds combined with long strokes, and in order to withstand the vibration the crankshafts must be made considerably larger in diameter. These conditions result in an engine which is considerably heavier than an engine of equal power with a shorter stroke and greater bore.

(4) **Noise from Engine.**—This is due to vibration and valve actuation, and is so well known that nothing need be said about it.

(5) **Lack of Flexibility.**—The long-stroke motor is not flexible. The compressions require so much effort to overcome them that the necessary weight of flywheel is prohibited.

(6) **Difficulty of Starting.**—In order to turn the long-stroke engine by hand, it is necessary to have a half-compression gear even for engines having a comparatively small piston area.

(7) **Danger from Pre-ignition.**—This is considerable, for although the pressure in the cylinder due to the pre-ignition may be no higher than that in a short-stroke motor under the same conditions, yet the crank arm being longer and the connecting rod being in a more oblique direction, the actual stresses induced in all parts are considerably higher.

(8) **Necessity for Stronger Shafts, etc., in the Transmission.**—Owing to the uneven torque due to the long stroke, and the wide variation between maximum, average and minimum torque, it becomes necessary to design the shafts to suit the maximum stress to which they will be subjected. Increasing the size of these shafts also adds to the weight of the chassis.

(9) **Increased Wear and Tear on Tires.**—This is due to the uneven torque of the long-stroke motors, the increased weight of the motor and chassis, and the greater amount of skidding between the tires and the road.

I think you will agree with me that the above is a good case against the abnormally long-stroke motor, and that it has no reason for existence except for the purpose of getting the better of a formula which is inadequate for present-day conditions of motor car engine manufacturing. The ordinary purchaser can always reckon that his tire bill will go up in accordance with the increased length of stroke.

Of course, no doubt it will be argued by those interested in powerful four-cylinder engines why a long stroke is desirable, and I think the reason for those so interested saying this is simply that, area for area, a six-cylinder motor can be run to develop greater horsepower than a four-cylinder with a short stroke, so that for powerful cars six-cylinder engine gives you the advantage over the four-cylinder, as with the same size engine one can get more horsepower, and as this horsepower is divided into six units instead of four, tremendous saving on one's tire bill and wear and tear on the mechanism is achieved.

I am sorry, in a way, when trying to obtain a really good formula for motor car competitions, that it brings out rather markedly the advantages of Mr. Napier's six-cylinder principle for motor cars, and this, no doubt, will have the effect of raising a lot of opposition of a commercial, but not scientific character. It remains to be seen what new objections will be raised.

AN ARGUMENT FOR THE LONG STROKE IN MOTORS

THE long stroke motor is distinctly advantageous, concludes Gerald Lavergne, after a close study in *Omnia* of the results obtained by all the most important European constructors. Its disadvantages, which may be summed up as increased area of the motor, increase in weight, increased losses in cooling (which can be diminished by the increase of the linear speed of the piston) are not to be compared with such advantages as the more homogeneous formation of the charge, the more complete accomplishment of the various cycles, and especially the better utilization of the explosive stroke, decreased wear, higher compression and the advantages which arise from it. Experience has abundantly proved the advantage of a long stroke. The question is what figures to adopt. Though it would be presumptuous at the present time to definitely fix the ratio of bore to stroke, certain modifications can be made with advantage to the figures generally adopted. The ratio of maximum pressure developed by the explosion to the average pressure is usually 15; there would be an advantage in diminishing this by reducing the piston area and increasing the stroke.

The proportions of the explosive mixture are generally 13.5 parts of air to one part of gasoline; the proportion might be increased to 15 parts of air. Thus, without fear of pre-ignition, the compression could be increased to 6 kilograms per square centimeter (85.3 pounds per square inch), or to 5 kilograms (71 pounds) for touring cars, in order to facilitate speeding up of the engine.

The linear speed of the piston, which, as shown by the table of leading French motors, model 1906, oscillated between 141 and 314 inches, increased to 472 inches per second in the single-cylinder Delage, which won the Grand Prix des Voiturettes. The speed could generally be carried to 310 to 390 inches a second.

Finally the ratio of stroke to bore, as shown in the table, of all the models built by over thirty leading French constructors has risen from 1.01 to 1.10 in 1906, to 1.11 to 1.20 in 1908, and has been increased to 2 in the single-cylinder Sizaire-Naudin racer, which competed in the Grand Prix des Voiturettes. We believe this ratio could advantageously be carried to 1.40 for touring cars or to 1.60 for small bore engines.

The following table shows the tendency of French and foreign constructors in the matter of ratio of stroke to bore, the models of 1906 and 1908 being compared from data supplied by the constructors.

	French cars 1906 Up to 6.2 ins. bore	French cars 1908	Foreign cars 1908
Number of builders	77	32	18
Number of motors	77	126	57
Percentage of short motors	10	25.5	7
Percentage of square motors	6	10.3	3.5
Percentage of long motors	84	84.2	89.5
Maximum ratio of stroke to bore	1.50	1.60	1.40
Percentage of ratios for long motors: above 1.30	16	21.04	6
from 1.30 to 1.21	9	17.4	26
from 1.20 to 1.11	28	50.9	40
from 1.10 to 1.01	30	10.3	28

SUGGESTIONS FOR THE MAN WHO DRIVES HIS CAR

By THOS. J. FAY, E. E., President Society of Automobile Engineers.

THE first six cases of this table appeared in September 10 issue. All dealt with the failure of the motor to operate, either on account of faulty assembling or of defects in the carbureter or battery ignition. In the following cases are considered further reasons for the failure of the motor to operate; reasons for noisy running; faults in the clutch and transmission, and finally, causes for excessive cost of maintenance. The same course of procedure is followed; the known quantities or symptoms are first verified, and then, one by one, the unknown quantities are eliminated until the cause of the trouble appears.

CASE NO. 7—MOTOR WILL NOT OPERATE.

Known Quantities (involving the magneto).

(*a*) Compression is normal.
(*b*) Carbureter in normal state.
(*c*) Timer in good order (battery ignition side).
(*d*) Battery ignition wiring in good order.
(*e*) Battery in good order.
(*f*) Spark coil in good order.
(*g*) Spark at the spark plugs.
(*h*) Magneto system will not work.

Unknown Quantities (involving the magneto.)

(*a*) Defective spark plug?
(*b*) Soot on spark plugs?
(*c*) Magneto out of time?
(*d*) Secondary wiring leaks with compression (not shown in air)?

CASE NO. 8—MOTOR WILL NOT OPERATE.

Known Quantities (involving the magneto).

(*a*) Compression is normal.
(*b*) Carbureter in normal state.
(*c*) Timer in good order (battery side).
(*f*) Battery ignition wiring in good order.
(*g*) Battery in good order.
(*h*) Spark coil in good order.
(*i*) Magneto system will not work.
(*j*) No spark at the spark plugs.

Unknown Quantities (involving the magneto).

(*a*) Secondary wiring open circuit?
(*b*) Secondary wiring short circuited?
(*c*) Distributer contacts not bearing?
(*d*) Short circuited distributer?
(*e*) Primary contacts in distributer worn down and not making contact?
(*f*) Wiring wrongly connected?
(*g*) Magneto wiring (armature) short circuited?
(*h*) Permanent magnets demagnetized?
(*i*) Driving mechanism adrift?
(*j*) Condenser defective?
(*k*) Ground connection open circuited?
(*l*) General leak due to oil and dirt?

CASE NO. 10—MOTOR WILL NOT OPERATE.

Known Quantities (involving the cranking.)

(*a*) Compression is normal.
(*b*) Carbureter in normal state.
(*c*) Ignition systems in good order.
(*d*) Gasoline supply available.
(*e*) Motor "back kicks."

Unknown Quantities (involving the cranking).

(*a*) Hot motor?
(*b*) Spark advanced?
(*c*) Lost motion in spark control system?
(*d*) Combustion chamber incrustation?
(*e*) Detonating ingredients in gasoline?
(*f*) High compression and slow cranking?
(*g*) Timer adrift?
(*h*) Broken tooth in half-time gear?
(*i*) Camshaft out of true relation?

CASE NO. 10—MOTOR RUNS NORMALLY.

Known Quantities (involving the clutch).

(*a*) The clutch holds.
(*b*) Impediment to speed changing lever.

Unknown Quantities (involving the clutch).

(*a*) Kink in the sliding gear shaft?
(*b*) Bunged-up gear teeth?
(*c*) Linkage adrift?
(*d*) Sticky bearing?
(*e*) Broken lever?
(*f*) Broken or sprung gear case?
(*g*) Congealed oil in sliding mechanism?
(*h*) Lost keys?
(*i*) Dry surfaces (no oil)?

CASE NO. 11—MOTOR RUNS NORMALLY.

Known Quantities (involving the gears).

(*a*) Change speed lever is free.
(*b*) Clutch movement is free.
(*c*) Clutch holds.

Unknown Quantities (involving the gears).

(*a*) Key out of a gear?
(*b*) Stripped gear?
(*c*) Shaft spread?
(*d*) Shaft twisted off? (Planetary especially.)
(*e*) Gears slide by?
(*f*) Broken linkage?

CASE NO. 12—MOTOR RUNS NORMALLY.

Known Quantities (involving the clutch).

(*a*) The change speed lever is free.
(*b*) Clutch movement is free.
(*c*) The clutch does not hold.

Unknown Quantities (involving the clutch).

(*a*) The leather facing is oily?
(*b*) The leather facing is charred?
(*c*) The leather is hard and does not press uniformly?
(*d*) The clutch spring is weak?
(*e*) The clutch is out of alignment?
(*f*) The sliding bearings are dry?
(*g*) The clutch is worn and will not advance to a bearing?
(*h*) Clutch band broken?
(*i*) Clutch lever bent?
(*j*) Dog bent or worn?
(*k*) Toggle with excessive lost motion?
(*l*) Foot lever strikes deck?
(*m*) Take-up all in?
(*n*) Disc facings worn out?
(*o*) Discs adrift from keys?
(*p*) Cork inserts worn below surfaces?
(*q*) Clutch cone worn?
(*r*) Wedge cut away?
(*s*) Screw worn?
(*t*) Excessive oil?
(*u*) Dirt impediment?

(v) Take-up backs off?
(w) Chassis lateral backs away from strain?
(x) Spiral band too long?
(y) Affected by centrifugal force?
(z) Brakes either on or too tightly adjusted?

CASE NO. 13—MOTOR RUNS NORMALLY.

Known Quantities (involving the clutch).

(a) The change speed lever is free.
(b) The clutch sticks.

Unknown Quantities (involving the clutch).

(a) "Frozen" shaft?
(b) Lack of lubrication?
(c) Congealed oil (cold weather)?
(d) Sag in chassis frame?
(e) Shaft twisted?
(f) Spring broken?
(g) Disc deformed?
(h) Broken motor or gearcase arm?
(i) Deformed driving arm?
(j) Thickened leather or other facings of disc clutches?
(k) Damage due to thrust?
(l) Bent crankshaft?
(m) Bent planetary shaft?
(n) Deformed linkages?
(o) Stuck "dogs"?
(p) Worn screw?
(q) Tight spiral band?
(r) Dent in housing?
(s) Shifted motor?
(t) Shifted transmission?
(u) Dirt (foreign substances)?
(v) Bent foot pedal?
(w) Insecure locking devices?
(x) Centrifugal force?
(y) Torn leather facing of cone clutch?
(z) Worn faces changing the distance of travel?

CASE NO. 14—MOTOR RUNS NOISY.

Known Quantities (involving the motor).

(a) Compression moderate.
(b) Runs bot on retarded spark.
(c) Knocks badly on long grade.

Unknown Quantities (involving the motor).

(a) Carbureter delivers rich mixture.
(b) Excessive lubrication.
(c) Poor selection of lubricant.
(d) Cooling system inefficient.
(e) Carbon deposit in cylinders.

CASE NO. 15—MOTOR RUNS NOISY.

Known Quantities (involving the motor).

(a) Compression moderate.
(b) Lubrication good.
(c) Cooling system efficient.
(d) Carbureter working correctly.
(e) Timing correct.
(f) Knocks at the higher speed range.

Unknown Quantities (involving the motor).

(a) Pistons a loose fit?
(b) Pistons worn?
(c) Piston pin bearing slack?
(d) Crank pin bearings slack?
(e) Main bearings slack?
(f) Crankshaft bent, imparting side shake to connecting rod?
(g) Crankshaft end motion?
(h) Valve clatter due to strong springs?
(i) Valve clatter due to wear in guides?
(j) Loose valve lifts or tappets?
(k) Loose half-time gears?
(l) Camshaft twisted?
(m) Timing deranged?
(n) Flywheel loose on crankshaft?
(o) Clutch scraping?
(p) Connecting rod striking crankcase?
(q) Stray bolt or nut adrift in crankcase?
(r) Wheezing of air or mixture through open seams?
(s) Exhaust manifold open at joints or elsewhere?
(t) Dry bearings due to lack of oil?
(u) Cylinder loose?
(v) Fan striking cooler (common)?
(w) Lost motion in timer?
(x) Magneto armature striking?
(y) Flywheel scraping on pan?
(z) Water pump worn?

CASE NO. 16—MOTOR RUNS NORMALLY.*

Known Quantities (involving noise).

(a) Car standing, motor runs noiselessly.
(b) Car running, motor runs noiselessly.
(c) Car runs noiselessly, direct on the high.
(d) Excessive noise on low gears.

Unknown Quantities (involving noise).

(a) Gears not set to the pitch line?
(b) Gears not properly shaped?
(c) Pitch line velocity of gears too high?
(d) Gear teeth bunged up?
(e) Gearshafts loose in bearings?
(f) Oil leaked out (planetary)?
(g) Transmission case full of grit?
(h) Shaft end motion (thrust bearing not adjusted)?

CASE NO. 17—MOTOR RUNS NORMALLY.

Known Quantities (involving noise).

(a) Car standing still, motor runs noiselessly.
(b) Car in motion, motor runs noiselessly.
(c) Car makes noise on all gears.

Unknown Quantities (involving noise).

(a) All possibilities of case seventeen?
(b) Bevel gears not adjusted?
(c) Bevel gears not properly shaped?
(d) Bevel gears not lubricated?
(e) Compensating gears deranged?
(f) Lost motion in live axle?
(g) Universal joints worn?
(h) Wheel bearings loose?
(i) Sprockets worn?
(j) Slack sprocket chains?
(k) Lost motion in radius rods?
(l) Lost motion in distance rods?
(m) Propeller shaft twisted?
(n) Jackshaft twisted?
(o) Loose spring shackles?
(p) Steering linkages loose?
(q) Steering knuckle, lost motion?
(r) Lost motion in steering gear?
(s) Flapping mudguard?
(t) Loose hood?
(u) Loose apron?
(v) Squeaks for oil in small bearings?
(w) Body loose on chassis frame?
(x) Click of roller bearing washers?
(y) Spring clamps loose?
(z) Shock absorbers loose?

*Note.—In some cars the direct is on the third speed, in others on the fourth, and there are some designed to give direct drive on both third and fourth. It will be understood that "direct drive" as implied in such cases is a play on language. It is direct as regards the change-gears only. The drive through the bevel gears is not eliminated.

CASE NO. 18—THE CAR RUNS NORMALLY.

Known Quantities (involving maintenance).

(*a*) The motor is sweet running.
(*b*) The transmission is adequate and silent.
(*c*) The compensation (differential) serves the purpose.
(*d*) The live rear axle is silent and satisfactory.
(*e*) The sprockets are silent and satisfactory.
(*f*) The propeller shaft performs properly.
(*g*) The wheels are of adequate diameter and strength.
(*h*) The steering is irreversible and steady.
(*i*) The gear ratio is appropriate to the motor.
(*j*) The cooling system is efficient.
(*k*) The brakes are powerful and dependable.
(*l*) The lubrication is profuse and dependable.
(*m*) The ignition is adequate and free from petty annoyances.
(*n*) Protection from dust and the elements, complete.
(*o*) The tire equipment is good and satisfactory.
(*p*) The carbureter works under all conditions.
(*q*) The fuel supply is adequate.
(*r*) The spring suspension is flexible and satisfactory.
(*s*) The lighting equipment is efficient and dependable.
(*t*) The clutch is not "fierce."
(*u*) The clutch will hold.
(*v*) The bearings are of adequate dimensions for the work.
(*w*) The chassis frame is rigid and strong.
(*x*) The universal joints are strong and free from lost motion.
(*y*) The battery equipment is of ample capacity.
(*z*) The tool kit is complete and appropriate.

Unknown Quantities (involving maintenance).

(*a*) The oil will become acid and etch the polished surfaces?
(*b*) The "decarbonizer" will attack the cylinder surfaces?
(*c*) The "dope" in the fuel will etch the cylinder surfaces?
(*d*) The "inflating gas" will deteriorate the tires?
(*e*) Open wounds in the tires will let dampness into the fabric and enable mildew to attack the same?
(*f*) The leather facings will be burnt if the clutch is permitted to slip?
(*g*) The fiber facings on the brakes will burn out if the brakes are kept "on" while the car is in motion?
(*h*) The sprocket chains will wear out if they are not kept clean and lubricated?
(*i*) The transmission will be noisy if "grease" is not used?
(*j*) The grease in the transmission will do damage if it is not changed regularly?
(*k*) The lubricating oil loses its lubricating properties?
(*l*) The "clash gears" will be bunged up if the shifting is carelessly performed?
(*m*) The springs will deteriorate if they are not kept oiled?
(*n*) The crankshaft will deteriorate the more quickly if the motor is "raced"?
(*o*) Excess lubrication will end in carbon deposits?
(*p*) Excess gasoline defeats power and increases cost?
(*q*) A steady gait ends in the greatest average speed?
(*r*) The car deterioration increases enormously with speeding for short distances, only to violently apply the brakes thus alternating between fast and slow?
(*s*) Parts subjected to "shock" will deteriorate in that the metal is rendered crystalline; the more quickly if the car is abused?
(*t*) Mud left on the body over night takes varnish off with it the next morning?
(*u*) Negotiating curves at high speed does much damage?
(*v*) A maker's guarantee is of no value to a reckless owner?
(*w*) "When the cat is away the mouse will play." The chauffeur does not own the car?
(*x*) Wet rubber cuts easily. Be careful on sloppy roads?
(*y*) Noise in a car is like pain in a man. It indicates some derangement to be looked after before it is too late?
(*z*) In relation to (*a*), (*b*), (*c*) and (*d*), it is to say, if the several products referred to are not appropriate, the owner of a car must assure himself of the characteristics of such products before he takes a chance, for, when the damage is done, he will have to pay the score?

In conclusion, it may be well to say, the "known quantities" as herein referred to are distinguished from the "unknown quantities" in that the first named are certain of identification, while the second are possible and to be looked for; in many cases, the sequences. The unknown quantities (so-called) are put as questions, under the circumstances, and are to be worked through and corrected until the trouble is cured.

EFFECT OF THE SPARE WHEEL ON THE HUB BEARINGS

By HENRY HESS.

THERE is a condition accompanying the use of the spare wheel of that type which is attached to the rim of the regular wheel, such as the Stepney, Burrowes, etc., which is not as yet generally recognized, but is of decided importance, namely, that the use of these wheels will in many cases affect the safety of the wheel bearings very considerably, even to the extent of positively endangering them.

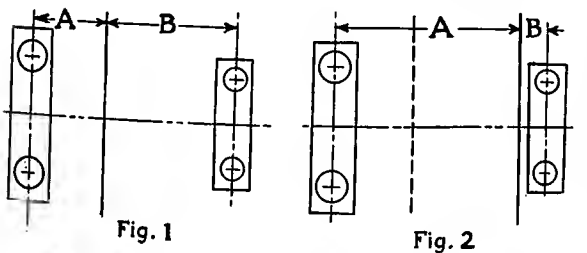


Fig. 1 Fig. 2

Diagram Showing Load Line with and without Spare Wheel.

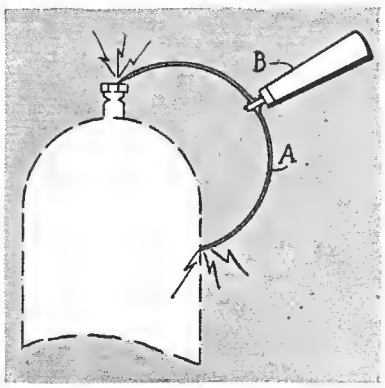
Fig. 1 is a rough diagram indicating the center line of the tread of the regular wheel with reference to the usual arrangement of the ball bearings in the hub. As the plane of the tread passes between them the load sustained by the wheel is divided between the two bearings in inverse proportion to the distances A and B. The bearings are selected for corresponding carrying capacities.

The use of a spare wheel changes the conditions to those indicated in Fig. 2. Here the dotted line is the plane of the regular wheel, as in Fig. 1, but as this wheel no longer carries any load it does not come into consideration. The full vertical line represents the plane of the spare wheel tread; depending upon the size of the tires and the relative location of the bearings, this line may fall within the small outer bearing, in line with it, or even beyond it. In every case the distance B is greatly shortened, with a corresponding increase of load on the outer bearing. This makes the load much larger than originally contemplated, and in all likelihood sufficiently so as to seriously endanger the bearing.

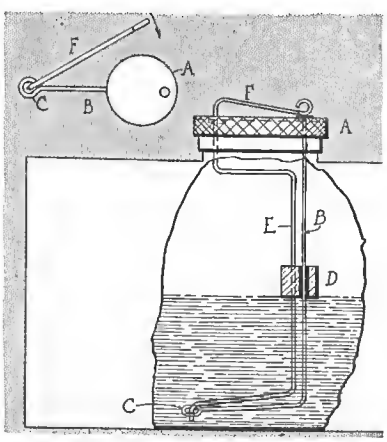
If a spare wheel of this type is to be used, then such use should be restricted to the unavoidable minimum for getting home, and even then cautious driving to avoid all sudden strains is imperative. Undoubtedly these wheels fill a real need, but the user should remember that a broken bearing is not nearly so easy to repair as a puncture.

WRINKLES OF INTEREST TO THE AUTOIST

WHERE a high-tension magneto is employed for ignition, it is rather difficult to test the spark plugs in order to find which one is misfiring, particularly when tbe autoist is not sufficiently familiar with the mechanism of the magneto and its internal connections to figure it out on the latter. Of course, on a coil and battery system it is easy enough to hold down one of the vibrators at a time, taking each cylinder in turn and thus locating the trouble. Or where a dual system of ignition using a set of accumulators and a high-tension magneto operates through the same set of plugs, it is not at all difficult to locate plug troubles, as the battery side may be resorted to, using the coil vibrators in the usual manner. But it is frequently the case that either a single, non-vibrating coil is employed, or there are two entirely independent sets of spark plugs. For testing the plugs under such conditions the simple device shown in the illustration will be found very convenient. To make this, take a piece of stiff wire, *A*, several inches in length and bend in a half circle as indicated. At its center fasten a handle, which for convenience sake must be of insulating material, otherwise it will be not a pleasant device to use. The handle from a discarded knife switcb will serve the purpose admirably, although a wooden one will do equally well where it is kept dry. To test a plug with the aid of this little device, it is only necessary to bring one end of it in contact with the binding post on the plug while the other is allowed to rest against the cylinder, or for that matter any other part of the motor, as it serves to short-circuit the plug to which it is applied, so that if the other three cylinders fire regularly during the operation, the plug under test is the one at fault and should be removed. The testing operation may be carried out very quickly.



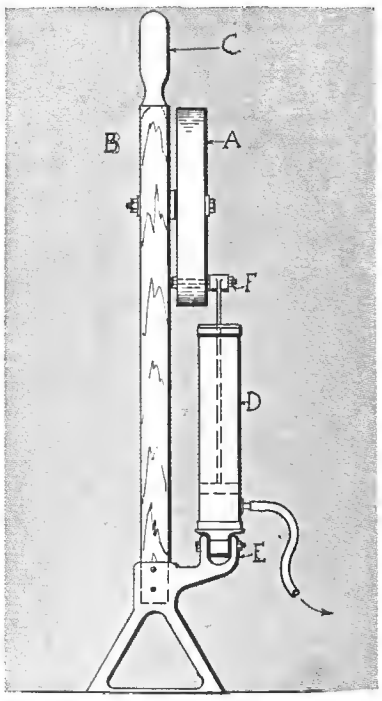
For Testing Spark Plugs.



Details of the Float Mechanism.

A Handy Gauge of Home Make.

To tell how much gasoline there is in the tank is always a matter of guesswork, and a stick is not always handy An easy way to make a gauge tbat is always reliable is as follows: Drill a hole in the tank cap *A* near the edge, and get a strong and stiff piece of wire *B*, long enough to reach to the bottom of the tank *A*. Bend one end at right angles about 1½ inches long and make a small eye *C*, on the end. Get a small cork *D*, and in the center of it put a piece of tubing so it will slide up and down freely. Put the cork on the wire and put it in the tank. Stick the wire through the hole in the cap, and see that the wire is straight up and down and that the end of the wire with the bend in it is on the bottom of the tank. Solder the wire to the cap *A*, where it is. Get another wire *E*, as stiff as the other one and bend it as illustrated. Fasten on the other one. A catch should be soldered on the top of cap *A*, to hold the wire against the cork when it is drawn out. Before the cap is unscrewed to see how much gasoline is in the tank, pull the wire lever *F*, as indicated by arrow in plan view, over on the catch on the cap *A*. This done, the wire will hold the cork *D* at the height the gasoline is, making a very easy way to find out how much gasoline there is in the tank.



Construction of the Power Pump.

Simple Power Pump.

Out of an oak board 1 inch thick cut a disk *A*, 7 inches in diameter, drill a ½-inch hole in the exact center. Put it on a lathe and turn the edge true. Next cut an oak strip *B*, 18 inches long and 1½ inch wide; turn a handle *C*, on one end, and on the other end fix a handle as shown. Now with a ½-inch bolt 2½ inches long fasten disk to oak strip with a washer between. Next get a good strong, and rather short bicycle pump *D*, and fasten to support *E*. Make a head *F*, on the end of the piston rod, with a hole through it, and with a strong wood screw fasten it to the disk *A* about ¼ inch from the edge. Be sure the piston reaches the bottom of the cylinder before the piston rod is cut the right length. The cylinder must be pivoted at the end *E*, so it can move back and forth when the disk *A*, revolves when it is held against a rear wheel. Fasten a rubber tube to the pump long enough to reach all the wheels, with a valve connection on the end; jack up one of the back wheels, throw in the low gear and hold the disk against the tire, and the pump will do the rest.

Avoid Using Abrasive Tools.

One of the commonest failings of the amateur autoist is to resort to the pipe wrench or the gas pipe pliers to loosen a refractory nut or connection, but any man who takes pride in the appearance of his motor and its fittings will avoid this religiously as one of the most important of the many "Don'ts." Such tools were never intended to turn nuts or similar fittings, and, as they only grip by sinking into the metal, the slightest slip means an abrasion of the metal that cannot be remedied. Square and hexagonal nuts soon become round and then shapeless, while tubing is hopelessly marred.

LETTERS INTERESTING AND INSTRUCTIVE

INFORMATION WANTED ABOUT IOWA LAWS.

Editor THE AUTOMOBILE:

[1,541.]—I would like to know where one can obtain a book containing the automobile laws of Iowa or laws on the right of way. I want to know this especially: an automobilist comes up behind a team and blows bis horn; the team keeps the road, and, ae tne automobile turns out to pass, the driver wavee his band as a signal to stop; if tbe automobiliet keeps on, ie he responsible for dsmages in case the horses are ecared?

I also want to know how to figure horeepower by the A. L. A. M. formula.

R. F. JOHNSTON.

Farragut, Ia.

Information about the Iowa automobile laws can be obtained from the Secretary of State, Des Moines. We do not know whether it is published in book form, however. Section 9 of the law of 1904 reads: "Any person operating a motor vehicle shall, at request or on signal by putting up the hand, from a person riding or driving a restless horse or other draft or domestic animals, bring such motor vehicle immediately to a stop, and, if traveling in the opposite direction, remain stationary, so long as may be reasonable to allow such horse or animals to pass, and if traveling in the same direction, use reasonable caution in passing such horse or animals, and the operator and occupants of any motor vehicle shall render necessary assistance to the party having in charge said horse or other draft animal so passing." Nothing is said about responsibility for accidents.

The A. L. A. M. formula is bore of cylinders in inches, squared, times number of cylinders, divided by two and one-half, equals horsepower.

BATTERY WIRING AND LUBRICATION.

Editor THE AUTOMOBILE:

[1,542.]—1. When using eight dry cells, should they be connected in series parallel, or in sets of four each connected series multiple?

2. My double-opposed motor runs much quieter when the crankcase is filled with oil to the extent that the exhaust smokes. By attaching baffle plates to the cylinders could thie same oil level be maintained without the oil reaching the combustion chamber to such an extent, and if eo, how ehould the baffle plates be made and attached?

SUBSCRIBER.

Columbia, Tenn.

The best arrangement is the series-multiple, as shown in the diagram on page 297 of THE AUTOMOBILE of August 27. This wiring gives the voltage of four cells, that is, from four to six volts, and the amperage of two. Series-parallel and series-multiple are one and the same thing. Putting all eight cells in series would be apt to injure the coils and their vibrators.

The baffle plates would not do much good on a horizontal engine, as when the oil reached any considerable height in the crankcase it would begin to flow through the slot for the connecting rod. In a vertical motor only the splash has to be considered, and here the baffle plates are very effective. The best plan would be to find the cause of the noise and correct it, instead of trying to muffle it with the oil. Very likely the connecting rod big ends need adjustment.

WHEN DO THE FACTORIES WORK HARDEST?

Editor THE AUTOMOBILE:

[1,543.]—During a discuesion, the question arose as to whether the automobile factories are rushed harder during the Summer months than in the Fall and Winter. Will you kindly eettle the dispute by giving your opinion on the same?

M. HORENSTEIN.

Uncasville, Conn.

The rush season depends largely on the factory, but it is much more likely to come in the Winter than in the Summer, because most buyers want their cars delivered in the Spring. All the larger factories, however, work on a regular schedule and have neither rushes nor lay-offs.

A CURE WITHOUT AN EXPLANATION.

Editor THE AUTOMOBILE:

[1,544.]—I have read with great interest Letter No. 1529, under "Letters Interesting and Instructive" in your issue of September 3, as I experienced exactly the same trouble, which was finally corrected after two months of experimenting. The float feed carbureter with metal float on my four-cylinder car persistently dripped gasoline after the engine was stopped, although I was absolutely certain that the valve wae tight. I purchased a new float and this did not correct the difficulty, and after lowering the level by small increments finally gave up and returned the complete carbureter to the factory for repair. When received and installed the trouble was worse than ever. Against the advice of other motoriets I began experimenting by adding weight to the float by means of wire wound about body, and after a few trials found that this completely overcame the dripping. I then removed the wire and after carefully weighing it on delicate scales, flowed an equal amount of solder on the bottom of float and have since had no trouble whatever. This method has recently been applied to another curbureter suffering with same symptoms and again effected a permanent cure.

E. M. KINNEY.

Schenectady, N. Y.

We have no doubt as to the permanency or effectiveness of the cure, which you state was accomplished in two separate cases on different carbureters, but must acknowledge ourselves at a loss as to the principle on which the remedy was applied. In other words, we find it difficult to understand why, when a certain level of gasoline in the float chamber causes the carbureter to drip after the engine is stopped, raising that level should prevent the dripping. Exactly what causes the dripping in the first place does not seem to have been settled, or in fact, any explanation attempted. It may be that the hot manifold continues to vaporize gasoline after the motor stops, and having no outlet this condenses and then drips out as the metal gets cold, but such an explanation is not plausible in view of the cure effected by means of raising the level, as this would only tend to aggravate matters. We would like to hear more about the case, as well as from other readers who have had similar experiences.

MR. DURYEA ON VARIED SUBJECTS.

Editor THE AUTOMOBILE:

[1,545.]—I fear your zeal in defenee of the four-cylinder form has led you into more grievous error than my defense of the three showed. Your etatement that the difference between one-ninth and one-sixteenth is 40 per cent. reminds me of the Pennsylvania Dutchman who leased his farm for oil purposes and was to receive one-eighth of the oil as rental. This looked like so small a part of the wealth boiling out of his ground that hie cupidity would not let him rest, so he asked for a new contract, and after some talking an ironclad one granting him a rental of one-twelfth was executed. It took a lot of explanation to make clear to him that he now got isse than before, and he exclaimed: "Well! I never knew before that eight wae more than twelve."

The difference is less than five per cent., which amount is eo small that many people cannot notice it. An expert in such matters can by actual test notice two per cent. difference in vibration, but this is only possible at slow speeds when the impulses are far apart. At the speeds now commonly used, with other things identical except that the three-cylinder for a given power must be a little larger than the four and have a slightly larger flywheel, very few people can tell by riding in the vehicle which motor is pulling them.

High compressions are not so common as they were a few years ago, and the fact that the public uses anything does not prove it best. As a matter of fact the masses are nearly always behind. Most of them are still using horses.

Say to "Inventor" that the belt drive is a delusion. The way those belts will run off the pulleys on bad roads will surprise him. They are fine in a shop where things etay in line, but on the roads found in America the belts are in the wrong place when hard work is to be done. Duryeas were belt-driven for a while because the public asked us why we did not use this "simple system" inetead of the splendid spur gear and individual system adopted by us in '93. The public is elowly learning what it ought to have, and when it does learn ae much on this subject ae the makers know then it will be proper to give it what it wants; but in the years gone by

every attempt to give what was wanted even though wrong had been bad for somebody or other in practically every instance.

If Mr. Waldin will grind the float valve he will stop the dripping from his carbureter. The float has very little lifting ability and so does not force the valve onto its seat very effectively. This necessitates most careful grinding. If a little trace of soap is on the seat it will hold better. I favor a valve point as small as possible, so that the float can work to the best advantage.

Without wishing to appear as criticizing Mr. Fay's able and instructive article, I call attention to the fact that the "Times-Herald" contest at Chicago in 1895 was won by a Duryea having a spray carbureter and Duryea rigs that used this device for several years before this. The fuel tank in most of the early Duryeas was placed where any leak could not drop on the motor, and this meant under the floor, so a pump was used to raise the fuel to the carbureter, which was near the engine, where it was warm. The float was adopted in 1897, and the auxiliary air valve in '98.

I feel sure Mr. Fay's remarks do not apply to the type of carbureter used on the Duryea rigs all these years. They have usually been open so the spray could be seen by looking into the open end and the fan shape of the particles of liquid as they left the small nozzle showed very plainly that there was no stream. The passing air travels so much faster than the liquid at that point that it tears off each projecting particle of liquid and carries it away as a small spray globule. This was easily proved by detaching the suction pipe and blowing through the carbureter.

If the carbureter was capable of doing its duty, each puff of one's breath would produce a fog so fine that it could not be seen unless in good light, although one's hand would wet quickly if held in line. If there were large drops present the carbureter had some fault which could usually be seen. I am not able to understand why there should be any difference in the performance of the carbureter when sucked through and blown through. The air moves as a result of a difference in pressure on opposite ends of the air passage, and if there is no connection with the gasoline surface the fact that these pressures are slightly nearer to atmospheric in one case than in the other can certainly not produce a spray in one case and a stream in the other, as is asserted.

CHAS. E. DURYEA.

Reading, Pa.

Mr. Duryea's arithmetic is startling, to say the least, and it would be very interesting to know how he arrived at the conclusion that the difference between one-ninth and one-sixteenth is only five per cent. However, until he brings forward some additional proof we shall stick to our original assertion that the difference is 40, or, to be exact, 43.75 per cent. For the rest, we have a great deal of faith in public opinion. It has been found right many more times than wrong, and usually has pretty good foundation for its decisions.

AUTO NEWS FROM THE SUNNY SOUTH.

Editor THE AUTOMOBILE:

[1,546.]—I am a subscriber to both your magazines, "The Automobile" and "Motor Age," and read them with interest, but very seldom see anything in them from this section of the South, and would like to state that we are not altogether dead to the automobile world.

We have a little city of 50,000 inhabitants, and among them a number of automobile enthusiasts. There are about 200 cars registered in the city; among them are the Oldsmobile, White, Franklin, Maxwell, Buick, Mitchell, Thomas, Chalmers-Detroit, Ford, Bianchi, Elmore, Matheson, Packard, Peerless, Stevens, Pope-Toledo, Rambler, Studebaker, Holsman, Schacht, Babcock, Pope-Waverly, and others.

There are two up-to-date garages in the city and several repair shops, and all of them have experienced mechanics and turn out good work. The roads in the county are in very fair shape and with a little work could be put in good condition. Mr. Lamar of this city, who drives an Oldsmobile roadster, has just completed a run from Macon, Ga., to Lansing, Mich., and return, a distance of over 3,200 miles, without any mishap, and reports a great trip. The outlook for the fall and winter auto trade here is good, and I think the agents here will do fine business.

Macon, Ga. S. R. JAQUES, JR.

If it is seldom that the South is heard from, it is evidently not because there is a dearth of automobiles there, to judge from your letter, but simply because the doings of their owners are not allowed to find their way over the "line." On this account, people are apt to come to the conclusion that there is little automobile news from the "land of cotton" because there are no automobiles down there to hear about. The chief thing lacking appears to be a live press agent. We would be only too glad to publish more news about the auto enthusiasts in the South.

IDEAL CARS ARE STILL POPULAR.

Editor THE AUTOMOBILE:

[1,547.]—Unless you have rung the bell on "ideal cars," I should like to submit one. Let it be understood that this is primarily a touring car. It is doubtful if any man could get up a car ideal for all purposes. Specifications:

Body—Straight line, five passengers, touring, metal.

Wheelbase—124 inches.

Tires—Front and rear, 36 by 4 1-2; demountable rims.

Axles—I beam front and rear.

Drive—Double side chains with mud-proof, dust-proof, and oil-tight metal chain case, something similar to that on the Chadwick Great Six.

Springs—Front, semi-elliptic, with side rail attachment for rear ends as on 1908 50-horsepower American Tourist; rear, platform.

Steering—Thread and nut, 17-inch wheel.

Cooling—Water, flat tube radiator, modified square in shape (American Tourist) to allow of greatest capacity within given limits.

Brakes—Three sets; regular hand and foot brakes, both being internal expanding, side by side in wide drums on rear wheels, as on the American Roadster, and an extra foot brake on the jackshaft, not to be used regularly, in order to save the chains.

Motor—Four-cycle with four offset cylinders cast in pairs. Valves large, though all on same side. Bore, 5 1-4; stroke, 5 1-2 (American Roadster).

Ignition—Double jump spark with high tension magneto and battery systems.

Lubrication—Splash, force feed. Pipes to cylinder walls and two to crankcase, divided into two separate compartments, as on Peerless.

Clutch—Disc, Stevens-Duryea type.

Flexible Joints—Two between clutch and transmission, similar to arrangement on Peerless.

Transmission—Four-speed selective, with direct drive on both third and fourth speeds as on 1908 40-45 Isotta Fraschini.

Bearings—All ball, except engine, which should be plain.

The ideal touring car should be chain driven, because when chains are encased as specified, none of the objections usually urged against this type apply, and because this construction is lighter and gives a better weight distribution, meaning less wear on tires, especially rear ones, and a car that rides better and behaves better generally on anything but perfect roads.

Furthermore, this construction admits of the type of transmission specified, highly desirable for a touring car, to be used in mountainous as well as level country, and permits of the unit construction of the transmission and driving gears, the advantages of which have been so extolled lately without resorting to the expedient, monstrous on a high-powered touring car, of mounting the transmission on the rear axle, as on some shaft-driven cars to-day.

Touring by Americans of America, where we cannot hope to have consistently good roads for many, many years, is just beginning to be popular. American manufacturers are, therefore, making a mistake in accepting as final the present popularity of the shaft-driven type, acquired by the use of cars for by far the most part, for pleasure driving in and around cities and suburbs. Instead they should exercise a little ingenuity to develop a satisfactory chain case, thereby perfecting the superior type of vehicle for touring, if, in fact, not all purposes, and one for which there will be a great demand when its advantages are more universally understood and after automobilists generally have had more experience with our country roads. DEMAREST LLOYD.

Redstone, N. H.

Your specifications are certainly specific enough. We think, however, that you will find several cars on the market which conform pretty closely to your principal requirements.

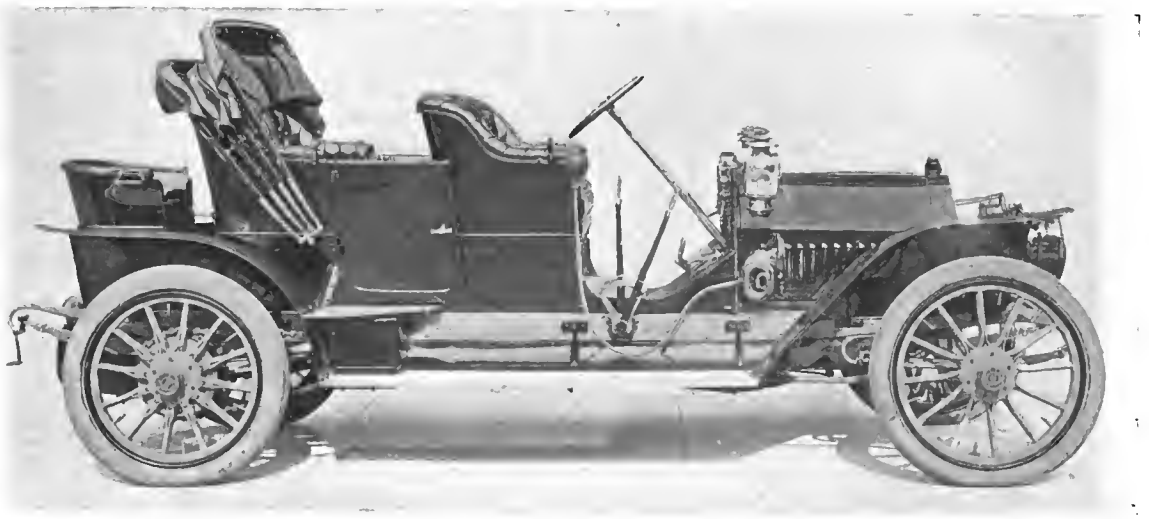
A YOUTHFUL AUTOIST FROM KENTUCKY.

Editor THE AUTOMOBILE:

[1,548.]—I am a little girl eleven years old. I have just been reading in papa's journal about Miss Bernice Haynes driving a car, and I was very much interested. I have been driving papa's car a little ever since I was eight years old, and, like Miss Haynes, I began by driving around the block alone on the low gear, and now mamma and I go most anywhere by ourselves over our beautiful Kentucky roads. "Dad" insists on the engine being stopped whenever we leave the car, so I think I can give Miss Haynes a pointer on getting it started. I find a place to stop with the car's head a little down hill, and, when we get ready to start, turn on the switch with the spark lever well back, throw off the brake, and, when we get going some, throw in the high gear, and away we go without cranking.

Papa says he would rather trust us out with "Old Cadillac" than with a horse, and I have never been towed in. Papa is teaching me how to care for the engine and make adjustments, and I am getting so I understand it pretty well.

Versailles, Ky. NATALIE H. BROTHER.



1909 Model of American Locomotive Car, fitted with Close-coupled Body.

THE AMERICAN LOCOMOTIVE CAR FOR NEXT YEAR

THOSE who have been interested in the product of the American Locomotive Company and the progress of American manufacturers will be glad to learn of the new policy and prices for 1909. Manager James Joyce made the statement that hereafter no Berliet cars would be made in this country, although the American Locomotive car from the same factory at Providence will be practically the same car in design and material. The name will be different, but otherwise it will be unchanged except by improvements in details. The Locomotive Company made the three-year contract with the French manufacturers in order that they might purchase experience, and it was not to be expected that the contract would be renewed. They feel that during this time they have accomplished their object with a perfect organization and can now do better working independently.

The terms of the contract—it is important to note—permit the American Locomotive Company to perpetuate in its future models any of the features of the French design used during the life of the contract. On the other hand, the contract required so close a duplication of the French model that certain desirable changes, making it more suited to this country, were prohibited. It will now be possible to make all these adaptations and at the same time retain the design and maintain the high quality.

Relieved from the payment of royalty and free to market its product under its own name and on its own terms, they have been able to make a large reduction in prices, so that now the American Locomotive car will be about the same as the ordinary high-grade American car. The six-cylinder car at $6,000, the 40-horsepower car at $5,000, the town car at $4,500, and a cab at $3,350 prescnt a fine line of automobiles with the prestige of an old-established company with $50,000,000 capital.

CARBONIC ACID AS A TIRE INFLATOR.

PARIS, Sept. 10.—Carbonic acid is worthless for inflating pneumatic tires, declares a Michelin expert. In view of a certain revival in the use of this gas for purposes of inflation, careful experiments have been made at the Cleremont-Ferrand factory in order to accurately test the length of inflation of tires pumped up with atmospheric air and with carbonic acid gas. Six different air chambers of one, two and three millimeters thickness were inflated, one of each having atmospheric air pumped into it to a pressure of 6.6 pounds, and three others taking carbonic acid to the same extent. They were left under observation for 72 hours, when it was discovered that their degree of inflation was as follows:

Thickness of tube.	Inflated with atmospheric air.	Inflated with carbonic acid gas.
1 millimeter	5.9 pounds.	1.3 pounds.
2 millimeters	6.3 pounds.	1.8 pounds.
3 millimeters	6.4 pounds.	2.3 pounds.

The experiment was made in an atmosphere of 64 to 68 degrees Fahr. A similar experiment with the same initial pressure but with the exterior air at 95 to 102 degrees Fahr. was even more in favor of natural air as a tire inflater, the results being:

Thickness of tube.	Inflated with atmospheric air.	Inflated with carbonic acid gas.
1 millimeter	3.5 pounds.	0 pounds.
2 millimeter	4.8 pounds.	.2 pounds (about)
3 millimeter	5.4 pounds.	.3 to .4 pounds.

EXPORTS SHOW SLIGHT FALLING OFF.

According to the Government reports for July, the number of automobiles shipped abroad by American manufacturers for the seven months of 1908 ending with July is considerably below the number for the corresponding period of 1907. It is worthy of note that, even with this falling off in the number shipped to foreign users, the grade of machines seems to have been of a much higher class, for during the first seven months of 1907 the custom records show that 2,052 machines having a total valuation of $3,825,969, while for a like period this year only 1,528 machines were sent abroad, but their total valuation of $3,225,166 is nearly equal to that of 1907. From these figures we are led to infer that the higher classed American product is meeting with increased favor across the water. As regards the automobile trade of foreign makers in this country there seems to be little change in the amount of business they are doing here, so far as the number of machines is concerned, although the figures show a very substantial falling off in their total value, during the first seven months of 1907 the foreign manufacturers imported 559 machines, valued at $1,827,590, and for the same period this year 558 machines, valued at $1,170,624. France, as usual, leads the list of foreign countries shipping to this side, with over 400 cars for these seven months, both last year and this.

AUTOMOBILE WAGONS TO CARRY AUTOS.

PARIS, Sept. 10.—Automobiles requiring to be shipped from one end of France to the other need no longer be mounted on an open truck and covered with a tarpaulin if the Paris-Lyons-Meditérranée Railroad is used. This company has just had constructed eighty special covered wagons specially designed for the transportation of automobiles. Entrance is at each end by full hinged doors opening outwards, sliding side doors being also provided for the entrance of persons only. The interior of each wagon is so fitted that the largest or the smallest automobile can be secured in a few minutes, without any possibility of it working loose under the greatest sbocks and without any danger of the paintwork being scratched. Movable bars with suitably shaped blocks attached to them fit in grooves ready to be brought to the front and rear of each axle and there secured by stout pins. Heavy leather straps give further security, and rolling is prevented by other attachments to the body of the car.

With the use of these wagons all that will be necessary for the transport of a large car will be to run it to the depot under its power, enter it in the wagon, draw off the gasoline as a precautionary measure, and attach it. No packing whatever is required, and on arrival at destination the automobile needs no more attention than if it were being brought out of the garage. The new railroad wagons will be principally used for the transportation of powerful open and closed cars from Paris to the southern pleasure and health resorts, the travel to which is very heavy the greater portion of the year.

AN EXAMPLE OF HIGH-GRADE BODY WORK.

One of the handsomest, not to say the largest, automobiles in New York City left the shops of Locke & Company, body builders, last week. The chassis is a 50-60-horsepower six-cylinder Renault; its wheelbase is approximately 13 feet, allowing ample accommodation for a roomy seven-passenger body. The two extra seats in the tonneau are fixed and of the bucket type, nearly as wide as those in front; a passage between them gives entrance to the rear seat. The body is finished in a rich, dark blue with cream striping, pleasingly relieved by the "basket work" on the upper panels of the seats. Equipment includes a five-bow folding top and a Huillier flexibly mounted glass wind shield, a type not often seen in this country.

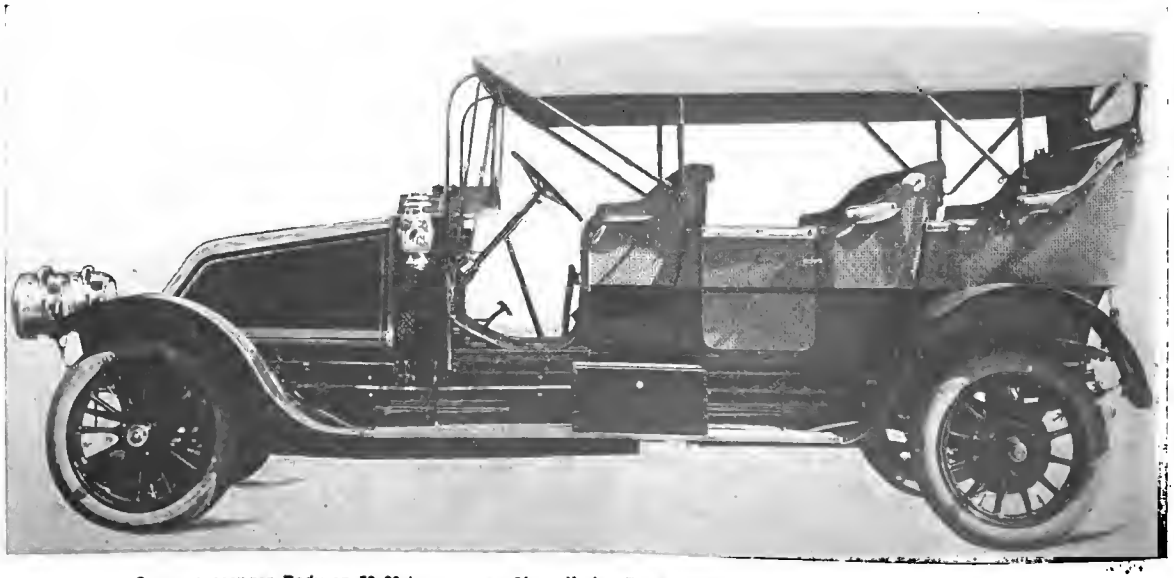
A CALIFORNIA CRUISE OF STEAMERS.

SAN FRANCISCO, Sept. 12.—Forty-three White steamers manned by 260 persons, and under command of Admiral C. A. Hawkins, formed the northern division of the "White Squadron," as it made its first cruise on a recent Sunday to Muir redwoods. The success of the occasion was greater than was anticipated, notwithstanding an occasional call on the tire-repair wagon for assistance, as the roads were very rough in places. The ferryboat *Ukiah* has been chartered in this city to transport the "steamers" across the bay, where squadron formation was called by Admiral Hawkins. The route taken was over the Bolinas road, and up the creek road, as the former route was not in condition to be traveled. Up the creek to the redwoods, it became a veritable cruise, as the water was up to the hubs of the cars most of the time, on account of the many fords. Anchored in the snug harbor of the Muir redwoods, the hungry officers and their crews partook of the bounteous luncheon which had been prepared for them at Muir Tavern. When luncheon was over, several hours were spent in exploring the redwood canyon, which has lately been acquired by the government.

Most of the steamers were navigated by their owners, many coming from a distance, from Santa Cruz, San Jose, and Oakland to participate. The return cruise was made over the ridge by way of Mill Valley, and the return trip of the *Ukiah* was made with forty-five machines aboard. There was almost every model of White steamer to be seen, from the little back-entrance car to the fine big straight-line body steamers. What speaks most forcibly of the success for the event was the cry to be heard on all sides: "When can we have another cruise?"

The Austrian industrial car contest, under the patronage of the war ministry and chamber of commerce, will take place from October 20 to 31 on a circuit of 800 kilometers for vehicles bearing a load of more than 2,500 kilograms, and 1,000 kilometers for those carrying less. Only internal combustion motors are eligible, and they all have to be fitted with a tank capable of carrying sufficient fuel for the daily stage; neither may their weight, fully laden, exceed 9,000 kilograms.

Many real estate agencies near New York City use automobiles to show prospective customers their lots. But the purchaser is often disenchanted when for the first time he has to walk to the station.



Seven-passenger Body on 50-60-horsepower Six-cylinder Renault—One of the Largest Bodies Ever Built.

ONE-PIECE PRESSED STEEL REAR AXLE.

Among the many new products of the Timken Roller Bearing Company for 1909 is their new one-piece pressed steel tubular power axle, which they hope to put upon the market at an early date. One of the great troubles with the present form of built up axles is that a truss is necessary to take the strains. The Timken Company in manufacturing this new axle have made use

Fig. 1.—Rear view of rear axle, showing absence of protruding parts to catch road dust and mud.

of a special basic open hearth steel of high static resistance so designed that the axle itself will carry the load without the requirements of a truss. Advantage has been taken of the fact that tubular forms give great strength and resistance is distributed proportionally to the points of greatest stress by grading the thickness of the metal so that the heaviest part comes at the spring seats where the strains are greatest and the thinner parts toward the center.

Fig. 2.—Front view of rear axle showing gear carrier, spring bases, and brakes, comprising the complete unit.

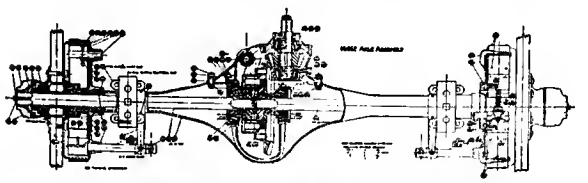


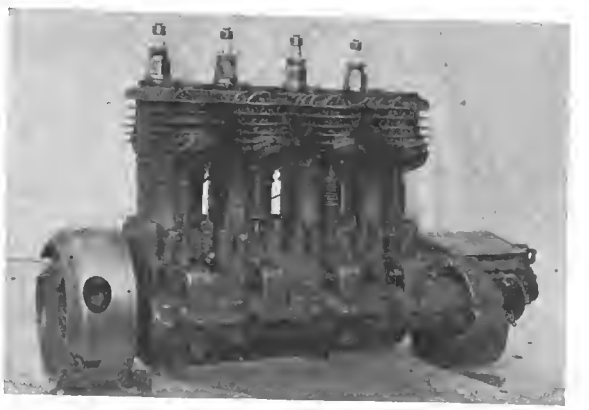
Fig. 3.—Plan view of one-piece rear axle, gear carrier, brakes, and wheels, illustrating method of placing gears.

As the accompanying cuts will show the designer has done away with all sharp curves thus avoiding any sudden angles which sometimes add leverage and increase the liability of shocks at the points of least resistance. Such a design not only gives stability but it makes a very clean cut and smooth looking axle, with no extra parts to get loose and easy to clean.

Fig. 4.—One-piece pressed steel rear axle housing.

This axle is designed to be used on cars weighing up to 3,000 pounds empty and of 45 H. P. or less.

Supplementary to this new axle, the Timken Company have about completed a new differential gear carrier, torque bar arrangement and improved brake equipment that will shortly make its appearance on the American market.



Inlet Side of Planche Motor, Showing Magneto.

A LIGHT FOUR-CYLINDER BICYCLE MOTOR.

The Motor Car Specialty Company, of Trenton, N. J., has brought out a four-cylinder air-cooled motor, called the "Planche," which they believe is the smallest four-cylinder motor ever manufactured in the United States. It was designed to drive motorcycles, but is suitable for any purpose where a light four-cylinder motor is required. The cylinders are 2 1-16-inch bore by 2 1-4-inch stroke and both cylinders and pistons are finished by grinding. Cooling flanges are cast integral. Both inlet and exhaust valves are mechanically operated, and are on opposite sides of the cylinder; they have nickel-steel heads and carbon-steel stems. The crankshaft is forged of 40-point carbon steel with hardened journals, running in plain cast-iron bearings; the camshafts are also hardened. The motor is fitted with a Simms-Bosch magneto, inverted and driven from the front end of the crankshaft. This model at 2,000 r.p.m develops about 6 horsepower. The weight, without magneto, is 54 pounds.

SOME MISINFORMING INFORMATION.

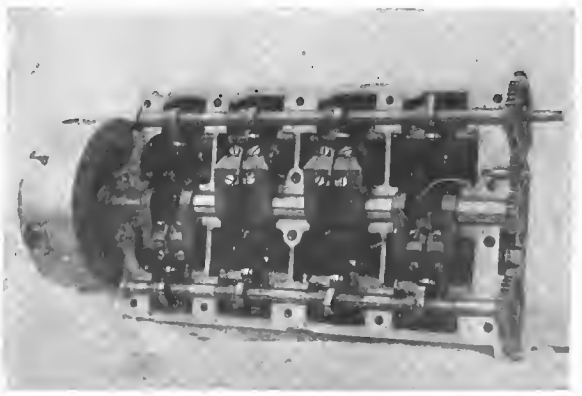
(From Our Press Clippings.)

One of the hardest things to teach a new hand is not to leave the speed gears in the mesh *while the motor is running.*

Don't fill acetylene gas *lamps* with carbide until they are to be used, as carbide is very susceptible to moisture and slacks readily on exposure to air.

An idea of the utility of the *automobile* may be had from the fact that the average carrier can transport, in a *wheelbarrow,* 150 pounds ten miles a day.

On a good road, the average 2,500-pound car, with a *6 x 7-inch* opposed motor, carrying five passengers, should cover seventeen to eighteen miles to the gallon of gasoline.



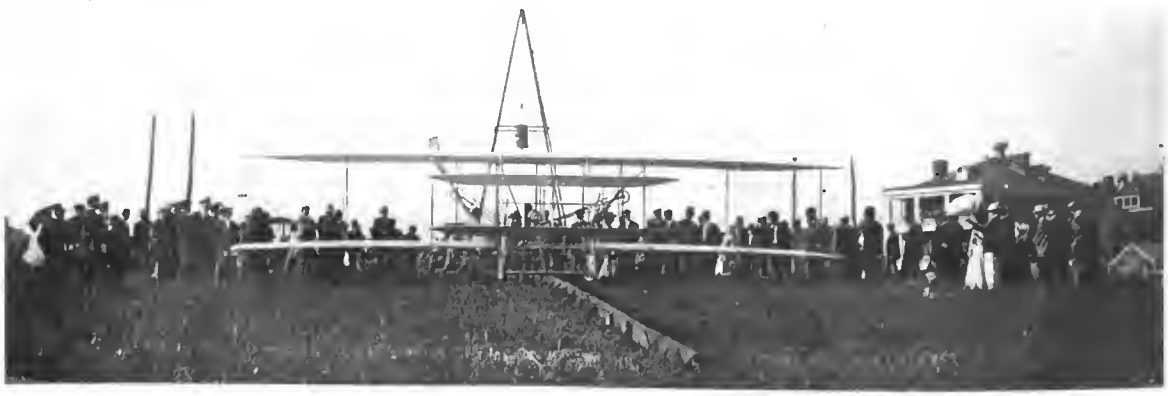
Bottom View Planche Motor—Lower Half of Case Removed.

HOW ORVILLE WRIGHT MADE HIS FLIGHTS

By E. PERCY NOEL

WASHINGTON, D. C., Sept. 14.—It was with an almost audible screech of victory that the great white eagle of the Wright brothers raced directly over the head of Major Fournier, military *attaché* of the French embassy, on September 9. To the hundred or more automobilists whose cars were lined up just off the aeronautic field of the United States government at Fort Myer, Va., it was plain that although the French may claim the earliest practical development of the automobile of the road, the United States stood first in building the true automobile of the sky as embodied in the Wright machine.

A memorable occasion it was—the day that will go down in the world's history, and notably in the long list of achievements of the automobile engine. For, if it was not the day on which the subjugation of the air began, it marks the time when the universe awoke to the fact that man with a motor-driven machine, heavier than the air, can successfully fly through the atmosphere. At this time Orville Wright, the man, and a 30-horsepower four-cylinder twin-screw Wright brothers' aeroplane, the machine, made three runs, each of which exceeded all previous true mechanical flight records, and two of which doubled all such records, official or claimed, in the world.



Wright Aeroplane on the Experimental Grounds at Fort Myer, Va., Showing the Starting Rail.

Little wonder, then, that Cabinet members and other high officials, to say nothing of a thousand spectators, felt the thrill of tremendous excitement and declared that they had witnessed the most marvelous sight of their lives, realizing, many for the first time, that aeral transit is practical!

Mere words cannot convey the feeling that the first sight of this capable sky motor produces in the human mind as it skims the air with and against the wind, up, down and around about. When it touches the ground the mounted soldiers are for a minute dazed, the spectators, respectful yet mad with enthusiasm, rush in one big tumbling mass to surround the aviator and his machine. They fight for the touch of his hand. Women become hysterical and even the seasoned men of war and of the press are, as the slang has it, "rattled."

"He will rest on his laurels now," said someone when the hero of the ninth, did not go to the field next day for an early morning flight. But not Wright. In the afternoon and in others following he mounted his apparatus and soon after his machine slid off the starting track to break the record of the day before. And in this way he will continue, rapidly climbing higher in achievement until he is ready to make the official trials before the board of tests of the United States Signal Corps. What he will do then will be insignificant in his estimation; a run of five miles straightaway and return at the rate of 40 miles an hour, and endurance drive of one hour—in each case carrying with him a passenger.

It was with his two-man run that Wright clinched his claims upon aerial success on the memorial ninth. Perhaps he thought he might as well do it all in one day, but it is more probable that this man who is so unassuming in his manner and speech, thought little of the history he was making. This flight, which began shortly before 7 o'clock might have been continued as long as the one that preceeded but that darkness came on, with only the golden harvest moon and late twilight to illuminate the field.

On the morning of the record-breaking day Wright went aloft at about half-past eight before a handful of people, mostly his friends. He remained in the air 57 minutes 31 seconds, making 57 large ovals in space. Because of the purely friendly character of his audience, he was easy and comfortable in his seat, and the absolute calm that prevailed made him less and less cautious as he swung around his course. Frequently he waved his band to the happy ones below; once he adjusted his cap and even turned to look at the motor a few feet to the right of him. Plainly it was not essential that he tightly clasp the levers—two at his right and one at his left—under favorable conditions. He explained afterward that he could hold the right levers in place with his knee and that the left lever was always held quite securely by a band brake.

Wright had said a few days before that he would not take any chances of breaking his machine until the time came for the official trials, because the aeroplane is the only immediately available one and that it must be delivered on schedule time. But on this morning flight he took great risks. He flew the highest that he had previously taken the machine aloft, rising to a height of 125 feet; afterward he increased it to 250 feet. He made his elongated circles so extended that he passed over rough underbrush, and even the top of the aeroplane hangar.

When it was over and the field telephone was transmitting the news to the city to be flashed over the face of the earth, Wright's mechanic asked him: "Why didn't you stay up an hour?"

"An hour?" asked the aviator. "How long was I up?" And when told, he said: "I thought it was about 40 minutes. Could have stayed an hour as well as not. My eyes hurt me a little, so I thought I would stop."

When he announced that he would make another run in the afternoon at 5 o'clock, the chief servants of the Republic were

notified, and many of them, including the Secretary of War, the Secretary of the Navy and the Secretary of Commerce and Labor, drove out in government automobiles to see the aeroplane. Everyone of them admitted the thrill of the occasion when the machine started off in a businesslike manner and again and again flew directly over them.

THE AUTOMOBILE correspondent stood beside the battle-scarred Secretary of War. "Do you feel a little thrill?" he questioned.

The stolid face reflected a smile as the veteran of war admitted, "Yes, I do. It's wonderful, marvelous!"

The Secretary of War had never seen an aeroplane aloft before. He has never been very enthusiastic about the aerial future.

"Can you see the practicability of it?"

"That's another question——" and just then the white bird with its fusillade of open exhausts that make conversation impossible, flew just 20 feet above our heads. Afterward he stated that he could not see much utility for the apparatus in its present form, but that he could foresee that there was a practical future in development of the basic ideas represented.

Meantime the ungainly thing, that had become that day something beautiful, ran evenly at an altitude of about 75 feet, the steadily-firing motor never missing an explosion until 50 long laps of nearly a mile in average length had been accomplished. The hands of the stop-watches were nearing the hour.

"Give him a cheer when he comes round, and make it good and loud," shouted an officer.

Then the hour elapsed, and the sky motor approached the starting track, and the spectators assembled behind it. As he made his turn a cheer rose so loud that the aviator heard it above the exhaust explosions of his motor, and, releasing the right levers for the first time, he waved his hand repeatedly. The crowd cheered louder than ever and a hundred motor horns joined the enthusiastic chorus. Every lap that Wright added after that the cheering was repeated. When he alighted a few minutes later, almost at the feet of the high officials, his time was 1 hour 2 minutes 15 seconds.

Official time was taken by Augustus Post, secretary of the Aero Club of America, who had never missed an hour at the field while Wright has been there.

"Do you want to go?" asked Wright of Lieut. Frank P. Lahm, soon after the descent.

"I should be delighted," replied the officer.

Somehow they wormed their way out of the crowd that was 15 deep around them, and walked half-way down the field. There the lieutenant received his instructions. While these two talked, the machine was again mounted on the starting rail, the weights hauled up in the derrick and all made ready.

Lieut. Lahm climbed into the right-hand seat, nearest the motor, and as he did so his cap struck the cord that is used to shut off the gasoline for stopping the engine. The unexpected stoppage caused some anxiety among the spectators, but it was over in a minute, as the mechanics cranked over again by pulling on the propeller blades. The motor rattled steadily for a few seconds. Then Wright touched the weight trigger and the machine with its two passengers on the seat that measures 28 inches in length by 8 inches wide, slid down the track and shot off at the end, a foot from the ground.

The aeroplane did not immediately rise from this elevation, but continued for several hundred feet, roughly brushing the grasses. Then Wright tilted his forward balancer and all rose to a height of about 15 feet. At this altitude a long turn was made. On the next circuit the machine rose higher from the earth, and finally attained a maximum height of about 40 feet. Approaching night stopped the run after the two men had been 6 minutes 26 seconds aloft, having covered fully 4 1-2 miles.

Wright does not control the motor while in the air, and he did not advance the make-and-break spark from its usual point when alone before taking up a passenger with him. In spite of this the speed of the machine was approximately 36 miles an hour. He believes that by opening up the motor's speed fully he will be able to fly at least at 45 miles an hour.

On the day following, September 10, Wright added three minutes to his time record of the day before. What was more interesting, he rose to a height of fully 200 feet, and at that elevation completed many long ovals. It was the first long demonstration in a stiff breeze and was for that reason important. The anemometer showed a wind speed of not less than nine and as much as ten for the 1 hour 5 minutes and 52 seconds that the machine was in the air.

Orville Wright Preparing for Record-breaking Flight.

After the flight two cables were handed to the aviator. One from his brother Wilbur and the other, it is thought, from England. Wright would not allow the latter to be published, but intimated that it was from an amusement manager. The quiet little unassuming hero does not care for that kind of publicity. The cable from Wilbur Wright was in code, except for the last two words—*"Très bien."*

After the success of the ninth, THE AUTOMOBILE correspondent propounded a hypothetical question: "Now, Mr. Wright, that you have established such remarkable records in America, is it not probable that your brother Wilbur in France will immediately begin to make longer flights?" The avaitor smiled and would not answer; but it was not hard to guess why the first great achievement of these men took place in the United States.

On September 10 Wright remained in the air one hour, five minutes 52 seconds; September 11 his time was one hour 10 minutes 24 seconds. On the day following, before a crowd of 5,000 people, many well known, he broke two of his own records. Carrying with him Major Geo. D. Squier, acting chief of the United States Signal Corps, he remained aloft nine minutes six and one-third seconds, traveling at the rate of 38¾ miles an hour. Flying alone, he was in the air one hour 14 minutes 25 seconds, making 71 great ovals in the air.

In the Air Making a New World's Record.

Mr. and Mrs. Macfarland and Their Reo In Which They Toured.

LONG before we were the owners of an automobile, it had been one of out great desires to make a thorough trip of New England. When we became autoists, our old ambition was revived. The opportune time came this summer for a comprehensive survey of the impressivc grandeur of the White Mountains, and the most pastoral scenery of the Green Mountains. When Saturday, the first day of our vacation, dawned we were ready to start at 6 A. M. for Stockbridge, Mass., a distance of 145 miles. Our route lay via Portchester, Norwalk, Bridgeport, Naugatuck, Waterbury, Winsted, and Great Barrington. Entering Norwalk we had an interesting experience. Mrs. Macfarland and myself rarely care to exceed 15 miles an hour when autoing. This we find insures that health-giving ease and comfort which is the primary object of all our automobiling. Moreover, when we bowl leisurely along we can see and enjoy the scenery.

Unnecessary to Monopolize the Road.

We had begun to climb the steep hill just before entering Westport avenue at about a 15-mile per hour clip, when suddenly our attention was arrested from the rear by an impatient "honk! honk!" We looked back and found that it was a big foreign car belching at a terrific rate. I steered slightly to the right and permitted it to pass us. Presently the burly leviathan lessened its speed in a marked degree, while our little Reo kept on gathering velocity. The road widened and permitted us to repass the bigger car, much to the chagrin of our erstwhile pompous friends. By this time the sporting elements in both Mrs. Macfarland and myself were on their mettle. We vowed to eat no more of their dust. I quickly opened the throttle and advanced the spark, and it was not long before we were a comfortable distance ahead. We did not relish the idea of being approached impatiently from the rear with a "get-off-the-earth" look and act, merely because our car happened to be a little smaller. So we probably exceeded the speed limit a trifle on that hill, not because we were speed-omaniacs, but because, in a measure, we were forced to assert the touring rights, privileges, and courtesies which fellow tourists owe to one another, and particularly where there are ladies.

We arrived at Waterbury, a distance of 77 miles, at 10.30 A. M., where we had our second breakfast. The roads were excellent, barring some long stretches of sand and steep hills near Thomaston and Winsted. Thoroughly refreshed and eager to press forward on our second day after a good night's rest, we headed for Manchester, Vt., a distance of 71 miles, via Lenox, Pittsfield and Williamston. Steep hills and many stiff water-breaks were the incidents of the day's run. These had no terror at all for us, for with the rational wheelbase in our Reo, and its rear seat detached and replaced by a luggage hamper, we swept over the mountain tops with ease, our delight augmented by the beautiful country and the charms of perfect midsummer weather. It was on this day's run that we saw the Bennington battle monument, which was dedicated August 19, 1891, in commemoration of the victory won by a force of the New Hampshire militia under General Stark against Colonel Haum and a detachment of Burgoyne's army, August 16, 1777.

On this day we encountered a pelting hailstorm near South Shaftsbury, Vt, about 23 miles south of Manchester. Having no top on our car and being protected only by rubber ponchos, which, by the way, proved difficult for Mrs. Macfarland to don without seriously disarrranging her hair, we were urged by the gallantly disposed town clerk, who ran out from his veranda, to come in out of the storm. Needless to say we gladly accepted the kindly hospitality. During the lull of the storm we asked a native veteran of the Mexican and Civil Wars, whose silvery locks indicated at least one hundred rugged Vermont Winters, to take a ride in our car. But he refused, saying, "I am afraid of tbose gol-durned things, where I never wuz skeered of whistling bullets."

Young New Englanders Enthusiastic Autoists.

That an enthusiastic interest in autoing is borne by the younger generation in this mountain-locked hamlet was shown in the case of a prominent young man of the village. Not long ago he had to undergo an operation for a serious case of appendicitis contrary to his wishes. But there was no alternative. His father promised to do anything for him he chose, upon condition that he would submit to the ordeal. His choice was an automobile. He recovered, and to-day he is the envy of many a neighboring rugged Green Mountain boy.

The storm lasted the greater part of the afternoon, during which time we were regaled by the village gossip. Eventually the storm subsided, after which we continued on our way.

We were accorded uniform courtesy wherever we went. Everywhere the natives evidently were enjoying the fruits of their intelligence, thrift, and industry. Scarcely a hotel but what the progressive and prosperous farmer was well represented. One instance at the Bennington hotel will illustrate the usual run of our experiences. Here we dined at the same table in company with a genial couple, about seventy years young. Tbe husband wore a close-trimmed gray beard, and withal was sleek from the crown of his head to the sole of his feet. He seemed to belong to the old blue-blooded stock that has made the Granite State famous. His wife was one of those motherly dames, who mellow with age and whose eyes, instead of growing dim with advancing age, seem to gain lustre and conviviality. "I beg your pardon," said she to Mrs. Macfarland, with that freedom and ease that is born of true culture and hospitality, "may I ask you whence you hail from and where you are going?" After being duly informed, she then apologetically said, "I was specially interested, for you resemble my grandniece so much." Incidentally, Mrs. Macfarland then, too, noticed that her silvery-haired but blithesome questioner favored her own grand aunt. Then analyzing the radiant physiognomy of the elder lady's sterner half, Mrs. Macfarland thought she traced a strong hint of resemblance between him and myself.

I might go on indefinitely in this manner throughout our entire trip, but time and space forbid. Suffice it to say that a more intelligent and more hospitable folk never lived than those we came in personal contact with among the rugged mountain fastnesses of Maine, New Hampshire and Vermont.

And the wild raspberries and blackberries. Millions upon millions of them we found in endless procession. And what

luscious monsters! Just ripe enough to drop at the slightest touch. Frequently we paused to satisfy our ravenous craving and then with regret we would leave some of the better patches to fade away with the advent of Autumn leaves. To come so close to the big and generous heart of Mother Nature and to revel in her redolent and prodigal bounty certainly should bring joy and health to any sane and healthy man and woman and make him and her a better, nobler and happier American citizen than ever before.

The run from Manchester to Sunapee Lake, N. H., was 75 miles, made up in the good dirt roads and enough steep hills and water bars to lend zest to the tourist who enjoys an occasional sprinkling of the strenuous. Climbing Peru Mountain was exhilarating. The ascent was as a giant beside a pigmy when compared with the famous Jacob's Ladder of the Berkshires.

When reaching Simonsville, near Springfield, Vt., shortly before noon Mrs. Macfarland complained of a severe headache. This she attributed largely to the rich viands which she had partaken of in the various good hostelries at which we had stayed along our route. She longed for a light homemade luncheon. Presently we were directed to a motherly lady, who had a local reputation for dispensing luscious viands for weary and dust-begrimed motorists. Soon we were served a most delicious plain omelet, hot tea, hot biscuits, and wild raspberries and cream, the equal of which we had never relished before. It so thoroughly rejuvenated us that the drive from there to Sunapee Lake proved one of the pleasantest runs of our entire trip, and that is saying a great deal.

An Ever-Changing Panorama of Scenery.

Wednesday we covered the picturesque and mountainous run of 91 miles to Bretton Woods, via Bristol, Plymouth, and Woodstock over the White Mountains. After staying a day at Bretton Woods, we were ready to make our sixth day's run, an 82 mile jaunt to Poland Springs, Me. This we covered in about 5½ hours actual running time. Charmed by the grand view of valleys and mountains, and reveling in the glorous ozone of this popular resort, we yielded to the temptation to remain there Saturday and Sunday. Monday our route lay via Portland, Biddeford, and Portsmouth to New Castle, a distance of 81 miles. Apart from some occasional sandy stretches and some rough stony places, the roads were good through a rolling country. On our seventh day's run, we journeyed along the picturesque New England coast and enjoyed the Atlantic breezes for a stretch of 70 miles, our way leading through Hampton, Newburyport, Beverly, and Lynn, to Boston. Here we spent a week with relations and friends, making various tours within a radius of 75 miles of the Hub. From Boston we bowled happily to Providence and Newport, spending two days at fashion's summer capitol. The next attraction was Narragansett Pier, delightfully situated near the mouth of Narragansett Bay. Here we visited the scene of General Winslow's victory in December, 1675, when, at the head of 1,000 colonists, he defeated the Narragansett Indians, of whom 300 were killed and about 600 captured, while the whites lost 80 killed and 150 wounded.

New London, via Westerly, was our next objective point, the distance of 65 miles being comfortably covered. Having found the driving along the Long Island sound delightful on the day previous, we selected for our last day's run from New England to Mount Vernon, a route that took us through New Haven, Bridgeport, and Norwalk. At Mount Vernon our delightful 1,500-mile motoring tour came to an end, without the slightest mishap to ourselves or to our car.

I feel specially elated over our successful tour. At the completion of this trip I had driven my car 8,700 miles during the past two seasons. Not one cent has yet been paid for replacements. When I consider that I have negotiated the sandiest, roughest and muddiest roads and climbed the steepest hills in nine different States with such a splendid record of durability and reliability, it certainly testifies eloquently to the scientific design and superior construction of the car. It has proven perfectly adapted to all road and weather conditions. Never has its power and efficiency failed me. This has been largely due to the ample provision which has been made for lubrication—one of the principal sources of the life, power and smooth-running qualities of any car. Its axles are still in as perfect alignment as the day I bought it, while its springs, radiator and motor are likewise in similar condition. Automobiling under these conditions certainly is delightful and invigorating and within the reach of almost every man who now uses a horse and buggy.

Being only an amateur autoist and having accomplished what I have, I feel that others can do likewise. It certainly is worth the attempt. It should inspire many to do more. No steam locomotive has ever shown greater endurance, reliability and efficiency than did our little Reo. Americans may well feel proud of their automobile engineers and builders, who thoroughly know our rough roads and build and design their cars to successfully meet the strenuous conditions.

A SUMMER TRIP WORTHY OF NOTE.

MEMPHIS, TENN., Sept. 14.—What was probably one of the longest trips of the year has just been completed by one of this city's prominent automobile owners—Albert S. Caldwell—and his two friends, J. M. Folkes and Jack Carey. The party on leaving Memphis first proceeded to Nashville, crossing the Cumberland divide and on to Louisville, Pittsburg, Washington, Philadelphia, New York, Boston and many other cities in the East. They started on the homeward journey from the White Mountains, coming by way of Albany, Buffalo and along Lake Erie to Cleveland and Detroit, from there to Indianapolis and Louisville, where the machine, a six-cylinder Pierce, was shipped home by boat.

The Daimler Company's business year at Unterturkheim, closing on March 31, 1908, was hardly as profitable a one as that of 1906-07, and the financial crisis has also left its traces on the firm that manufactures the Mercedes vehicle. The net profit was 477,437 marks as against 1,505,840 marks of the previous year. A dividend of 6 per cent. will once more be paid.

In the Restful Quiet of One of New England's Shady Roads.

THE AUTOMOBILE

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ACHIEVEMENTS OF THE WRIGHT BROTHERS.

One day, no one knows how many thousands of years ago, some cave-man or tree-man discovered that a log floating in the river would bear his weight, and that he could move it by paddling with his hands. No telegraph, no printing press spread the story of his achievement abroad; only a group of his tribesfolk looked on, amazed and fearful, as he slowly made his way across the stream. To them it was a miracle. But they did not understand the significance of this first uncertain voyage; their knowledge furnished no scale by which to reckon its importance. Even the next step of development, the dugout canoe, was beyond the bounds of their imagination.

To-day we accept the *Lusitania* and the *Dreadnaught* with hardly a second thought; and to-day the Wright brothers are flying at Washington and at Le Mans. Man is beginning the conquest of a new element. True, for more than a hundred years it has been possible to ascend into the air by means of balloons; but the limitations of the balloon as a method of transportation have been obvious from the first. The short, gliding flights of Lilienthal may be likened to the first venture of the prehistoric discoverer upon the floating log. But for his untimely death, Lilienthal might also have made the application of mechanical power; as it was, the Wrights received the benefit of his experience, and to them belongs the credit of building the first real flying machine. The thousands of curious spectators who daily flock to see them witness the beginnings of a new period in human progress.

The most sceptical cannot doubt that the Wright machine really solves the problem of mechanical flight. A machine that has repeatedly sustained itself and an operator at a height of from 100 to 200 feet for an hour must be regarded as more than a mere toy. Moreover, it is strong, reliable and marvelously simple. So far, the only objection that can be found is the extraordinary degree of skill necessary to operate it successfully. The aviator must cultivate a sense of equilibrium many times more delicate than that of a bicyclist, and must control almost instantaneously a complicated system of levers. Birds balance themselves instinctively in the most abrupt and violent air currents; man can acquire this ability only imperfectly. Some automatic device, then, must be invented to take care of this function. When this is done—a trifle compared to difficulties already overcome—the aeroplane will be a practical conveyance.

As to the future of the flying machine, it is useless to speculate. Apparently there is no reason why it should not be capable of as great development as the cave-man's floating log, although this must of course be the work of many centuries. But, however rude and clumsy the present machines may appear in the light of future developments, they have nevertheless demonstrated beyond cavil the possibility of mechanical flight, and the Wright brothers deserve the credit therefor. Their names will look well beside those of many other American inventors who have worked for the good of all mankind.

* * *

IMPORTANCE OF MOTOR TIMING.

Familiarity may well be said to breed respect where the internal combustion motor is concerned, for the more one comes to know of it the more one must marvel at the adverse conditions under which it will continue to operate. Of these, probably the most common is faulty timing, and experience with a large number of motors serves to bring to light the fact that the possible range of valve operation and ignition is extremely wide indeed. That the motor may be made to work at all at either of the extremes of this range seems impossible at first sight, and herein lies the anomaly, as the two motors representing the greatest difference may often be found to give an equally satisfactory performance.

It will be apparent that the proper opening and closing of the valves is of vital importance to the operation of the four-cycle motor, as with the present high speeds now favored, it has at best a very small fraction of a second in which to complete each one of the phases of its cycle and any overlapping one way or another is bound to derange it. This was a matter that came in for all too little attention in earlier days, but its importance has become better realized since and it is now customary to index the flywheel, so that the timing of the valve mechanism may not only be checked up, when trouble due to this cause is suspected, but so that it may also be corrected when it is no longer what the designer intended it should be. Probably faulty timing is accountable for a very large percentage of the ills to which old motors are heir, and if more attention were given to this essential by the average repairman it would be an advantage to all concerned.

A. A. A. AND A. C. A. REACH HARMONIOUS AGREEMENT

COMMITTEES named by the American Automobile Association and Automobile Club of America to effect a settlement of their differences reached a basis of agreement several days ago, and the board of governors of the Automobile Club of America ratified the agreement at its last formal meeting. On Monday of this week the executive committee of the A. A. A. met to consider the plan, but failing to reach an agreement adjourned until Wednesday. After a protracted meeting the committee formally ratified the agreement, and the understanding arrived at formally disposes of the controversy and establishes friendly relations between the two bodies. Secretary F. H. Elliott of the American Automobile Association has issued the following official statement covering the main points:

It is agreed that the Automobile Club of America is the only American member of the International Association of Recognized Automobile Clubs, and that it is and shall be the only authority in America for the drafting of rules affecting and for the granting of sanctions for international races, and for the regulation of such races in this country. On the other hand, the matter of the sanction of and the formulation of rules for local and national races is agreed to be, as heretofore, in the sole power and jurisdiction of the association. The two bodies agree to cooperate with each other in making the Vanderbilt Cup race and the Savannah Grand Prize race successes. After the races of this year the two cups are to be deeded to an independent racing association, and are to be contested for annually, the Grand Prize Cup as the International trophy and the Vanderbilt Cup as the National trophy. It is also agreed that the club shall not encourage other clubs to withdraw from the American Automobile Association.

The essential points at issue between the two organizations have thus been settled, and their cooperation in the future in all matters relating to the sport of automobile racing is assured.

PENNSYLVANIANS, WELL ORGANIZED, TO AID AUTOING

PHILADELPHIA, Sept. 14.—Upwards of a score of automobile enthusiasts, including the executive committee of the Pennsylvania Motor Federation and the presidents of several of the clubs from towns in the eastern section of the State, gathered at the handsome home of the Automobile Club of Germantown last Friday morning to discuss ways and means of improving automobiling conditions in the Keystone State. It had been the original idea to wind up the business of the meeting in two or three hours, but the session developed so much of importance to the welfare of motorists generally that the motion to adjourn was not put till nightfall, and then the Germantown hosts insisted on all hands "staying to tea," although a bountiful lunch had been set for the guests at midday. As a result the meeting continued informally well into the night.

Besides Robert P. Hooper, of this City; Vice-President Peter A. Meixel, of Wilkes-Barre, and Secretary Paul A. Wolff, of Pittsburgh, there were present: State Senator Frederick A. Godcharles, of Milton; President Joseph A. Weeks, of the Automobile Club of Delaware County; President Powell Evans, of the Automobile Club of Philadelphia; President P. D. Folwell, of the Quaker City Motor Club; President John Burd, of the Delaware State Automobile Association; John A. Wilson, Franklin; Martin Kinports, Lancaster; Dr. J. F. Kleindinst, York; Dr. W. H. Stephens and Lyman H. Howe, Wilkes-Barre; J. Madison Porter, Easton; John G. Kugler, Pottstown; John H. Rex, Norristown; Joseph Bancroft, Wilmington, Del., and S. Boyer Davis, L. P. Baekey, chairman of the federation's committee of publicity; C. H. Wheeler, Mark B. Reeves, Stephen B. Ferguson and a dozen other Philadelphians were in attendance.

President Hooper's report was especially strong in its insistence that something should be done to keep the scorcher and road-hog automobilist within bounds, and he urged that the federation take drastic action on those who use highways as race courses.

Another feature of President Hooper's report—the necessity of increasing the membership—brought immediate action. After a thorough discussion of the matter the president was authorized to appoint a committee to organize automobile clubs in all sections of the State where there are a sufficient number of motorists to warrant such a course. Secretary Paul A. Wolff, of Pittsburgh, was named as chairman of this committee, which was ordered to get to work at once. One would imagine from the foregoing action that the recruiting work of the federation was lagging. Such is not the case, for immediately following the appointment of the committee no less than eight new automobile associations were admitted to membership. They are: Monroe County Automobile Association, Automobile Club of Lawrence County, Johnstown Automobile Club, Automobile Association of Scranton, Automobile Club of Franklin, York County Automobile Club, Pottstown Automobile Club and the Oil City Automobile Club. These additions bring the total number of organizations in the federation above the thirty mark.

After lunch S. Boyer Davis, of the legal committee of the Automobile Club of Philadelphia, read the rough drafts of a new State automobile law and a proposed new measure to govern the building and maintenance of roads, to be presented at the next meeting of the Legislature at Harrisburg in January.

AUTO ENGINEERS MEET IN CLEVELAND THIS WEEK

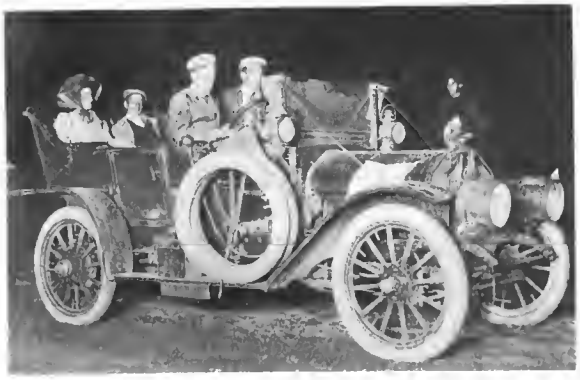
CLEVELAND, Sept. 14.—The Society of Automobile Engineers is to meet at Cleveland Thursday next for its third quarterly meeting of the present year, and the prospects are that there will be quite a number of members in attendance, as the strength of the society in the Middle West is rapidly on the increase. The morning of the first day, Friday, will be devoted to visiting a number of the automobile manufacturing plants which give Cleveland its important position in the industry, among them being the Stearns, White, Winton and Peerless, as well as some of the parts-making plants, such as that of the Hydraulic Pressed Steel Company.

The business meeting will be opened at the Hollenden after lunch and will be followed by the technical sessions, the latter also being continued after dinner in the evening. Saturday morning a special train will be boarded at the Union Depot for the trip to Akron, where the morning will be spent in making visits of inspection to the plants of the Goodrich and Diamond rubber companies, the society being the guest of the latter at a lunch to be held at the Akron Country Club. Following this the engineers will go to Canton, where they will inspect the plant of the Timken Roller-Bearing Axle Company as guests of the latter.

Arrangements are in charge of a local committee consisting of James G. Sterling, chief engineer of the Stearns company; F. B. Stearns, Harold B. Anderson, chief engineer of the Winton company, and H. W. Alden, of the Timken company, Canton. The papers scheduled for the meeting are: "The Limitations of the Universal Joint," by H. Vanderbeek; "What Carbon Does to Automobile Steel," by Thomas J. Fay, president of the society, and "What is the Best Timing?" by Louis Lacoin, a translation from the French of *Omnia*, by Charles B. Hayward.

EIGHT OUT OF FIFTEEN PERFECT IN OHIO RUN

TOLEDO, Sept. 12.—Toledo's first endurance run, organized and carried to a successful close under the auspices of the *Toledo* Times, the Toledo Automobile Club, and local automobile dealers, ended Thursday evening of this week. Out of fifteen cars which made the run, eight finished with perfect scores, with the probability that another perfect score will be added to the list after the matter has been taken up by the technical board of the A. A. A.



Mora Confetti Car Leaving Columbus Second Day.

The route of the run consisted of approximately 600 miles, roughly of triangular form. Starting from Toledo, the pilot car steered through Findlay and Marion to Columbus, which consisted of the first leg. The second day's run lay from Columbus, through Mansfield, Wooster and Akron to Cleveland, and the third and closing day comprised a circuitous route from Cleveland to Toledo. Lack of rain made the road fearfully dusty, and most of the penalties imposed were due to accidents or delays occasioned by dust and dirt playing havoc with the machinery. Nor was the route selected without idea or thought for the behavior of cars on steep and difficult hills. Few parts of Ohio contain more difficult hills for climbing than Holmes County, through a part of which the route lay. Luckily, however, no serious disasters resulted, although a few mishaps served to show the metal of the drivers.

The entrants, seventeen in number, two of which withdrew before the race started, were divided into two classes, amateurs and professionals, there being two of the former and thirteen of the latter. Of the professionals, twelve finished, the Maxwell, driven by Weger, being withdrawn, and of the amateurs, one, the Stoddard-Dayton, driven by Spieker, having fallen by the wayside on the first day's run through the loss of a wheel, occasioned by colliding with a farmer's wagon.

The result of the run as it stands at present is as follows:

Car.	Driver.	Standing.
Mora	Adams	1,000
Jackson	Schetfler	1,000
Jackson	Paxon	1,000
Brush	Huss	1,000
Reo	Adams	1,000
White	Phillips	1,000
Oldsmobile	Auble	1,000
Oldsmobile	Torgler	1,000
Mitchell	McIntyre	973
Chalmers-Detroit	Gamble	973
Maxwell Model H 2-cylinder	Bitesdale	705
Maxwell Model D 4-cylinder	Kelsey	542
Stoddard-Dayton	Atwood	No decision.

Of the standing, it may be said that possibly some changes will be made by the A. A. A. board, as certain features are to be referred to it for final decision; for example, the Stoddard-Dayton, driven by Atwood. It is reasonably certain that when this car was left in a Columbus garage for the night it was in perfect condition, but it was found to be damaged in the morning when it came to checking out, the damage, it is alleged, being due to careless handling on the part of the garage attaches. There is a disposition on the part of the officials of this run to allow Mr. Atwood a perfect score, in so far as his trouble in that respect is concerned.

Of the other losses, Kelsey was given on the first day 137 points, by reason of loss of time spent working over gasoline tubes which had become clogged with dirt. On the second day he lost 132 points for spark ptug trouble. McIntyre lost 27 points for the same reason. Bliesdale lost 295 points when his steering gear rod broke, as the result of hitting a large boulder. Weger was here entirely elimmated, by reason of spark trouble which caused his engine to overheat. On the third day Gamble lost 27 points for running into Sandusky a few minutes behind time, and Kelsey ran into his third dose of trouble by losing 189 points for a broken spring.

In point of interest and endurance, the second day was undoubtedly the best test of the run and brought out several notable incidents as the result. The trouble at Columbus, mention of which has been made, caused Atwood to leave the city a long time after schedule, with temporary repairs which allowed him to only use high speed gears, and this over that part of the trip which had been selected on account of the high and steep hills. Hill after hill was encountered and climbed in this unusual way, and Mr. Atwood reached Cleveland late in the evening.

Another incident happened to Bliesdale while going through the Holmes County hills. Descending one, his car skidded, and in so doing struck a stone, which carried away the steering arm. Apparently helpless, Bliesdale surmounted the situation by cutting a young tree with his pocket knife, fitting it to take the place of the broken part, and finishing the rest of the trip with this as a steering arm.

By reason of finishing with a perfect score, E. R. Torgler, of this city, wins the handsome cup set up for the best amateur record by the Toledo *Times*. Mr. Torgler's work was such as to call forth much admiration and the opinion from his fellow-sportsmen that he ought to be in the professional class. As mementos, the committee having it in charge will probably provide some kind of silver badges or medals, although the exact nature of which has not yet been determined.

Kelsey and His Maxwell Making Up Lost Time.

The officials likewise won the entire confidence and appreciation of the entrants by the just and reasonable decisions and fairness in all particulars. R. K. Davis, of the Maxwell-Briscoe-McCloud Company, of Detroit, was referee, and P. W. Eigner, of the Pope-Waverly Company, Indianapolis; H. H. Howard, of the Cleveland *Plain Dealer*, and M. M. Norton, of the Toledo office of the Goodyear Tire & Rubber Company, were the assisting officials. A Pope-Toledo car piloted the run, the rules governing which were customary to such events.

HOW THE CLUBS ARE

A. C. OF CALIFORNIA IS BUSY SIGN-POSTING.

SAN FRANCISCO, Sept. 12.—The Automobile Club of California, rue to its promises of a few months ago, has commenced the splendid work of what will be a monument to their organization, the erection of sign-posts. After several months of careful study and investigation of different methods of such an achievement, maps have been completed, posts made and signs

California Club Officials Placing the First Sign Post.

ameled and yesterday Samuel G. Buckbee, president of the ıb, and L. P. Lowe, chairman of the executive committee and esident of the California State Automobile Association, surintended the placing of the first post. A large gathering of al enthusiasts assembled at the scene, which was located at corner of Nineteenth avenue and Parkside boulevard, to witss the event, and to express their appreciation for the great od that will be forthcoming. The posts are iron, and are ostantially sunk in the ground about two feet deep, in cement ındations. Through the bottom of the posts, set in the nent, are twelve-inch iron rods.

The club will continue the erection of signs until the country well-posted north of the section which is being ably taken e of by the Automobile Club of Southern California. Then, rk will be taken up on the roads leading out of Sausalito, ıuron and Oakland, until the entire State is posted. Routes e been laid out as far as Lake Tahoe. Hearty congratulaıs were extended to President Buckbee and Chairman Lowe, be conveyed to the members of the club, on the commencent of this good work, and there is little doubt but that now t the ball has started to roll, the Automobile Club of Calinia will receive strong co-operation from the other local omobile organizations and enthusiasts.

CCESS OF KANSAS ENDURANCE RUN ASSURED.

ANSAS CITY, Mo., Sept. 14.—Every indication now points to success of the fall endurance run of the Automobile Club, of nsas City, which starts Saturday morning, Sept. 19, from ın Valley Park for Oklahoma City via Emporia and Wichita, ırning to this city via Guthrie and Winfield. The finish will n front of the *Star* office on Grand Avenue, as this paper has red a cup to the winner. The total mileage will foot up to r 920 miles, and it is fully expected that this run will prove as essful as similar tours have in the East. Indications are about forty machines will start, and, under the comparatively ent rules that have been made, more than half of the starters ıld finish with perfect scores. It was at first proposed to a strict system of penalization, but this was voted down, and s present form the tour should be enjoyable as well as inctive to every one of the participants.

SOME SELDEN LITIGATION NEARER HOME.

Following the meeting of the managers of the Association of Licensed Automobile Manufacturers, held in New York City early in the month, a report has grown that the session was not devoted entirely to the consideration of the ordinary routine business of the association, but that drastic action was taken with regard to two members who have been delinquent in their royalty payments. These are the Olds and Buick companies, and it is said that they have made no payments for nine months. Also that an action will be instituted to cancel the license of the Olds Motor Works, which is one of the original founders of the association, a similar move apparently not being contemplated in the case of the Buick at present. That there is some foundation for the report seems evident from the omission of the two concerns in question from the space allotments for the Garden show next Winter. When seen regarding the story Assistant-General Manager Chalfant said "There's a litttle truth and a great deal of fiction in it," but refrained from furtber comment.

CONNECTICUT CLUBS ON RIGHT TRACK.

HARTFORD, CONN., Sept. 14.—The Connecticut Automobile Association through the recently organized Torrington Club has gained 20 more members. Tbe more the merrier, for tbey will all be needed this Winter. A certain antagonistic faction has been keeping count of every automobile muddle that has happened this season for presentation to the lawmakers this Winter. However, the recent appeal of the Automobile Club of Hartford and of the State Association to automobile owners to respect the Connecticut law has not been without its good results. A careful survey of the situation reveals the fact that where there is opposition the party in question usually has a grievance, caused in many instances by the indiscretion of some lawless chap.

24-HOUR RUN OF BAY STATERS.

BOSTON, Sept. 12.—The touring committee of the Bay State Automobile Association, which has charge of the twenty-four hour Bretton Woods endurance run to be held September 23 and 24, went over the course a few days ago and as a result of its trip has announced some important changes. The committee found the roads in bad condition, so bad in fact that it decided that it would be unwise to send the cars through the mountains in a contest at night as originally proposed. Therefore instead of starting from Boston at ten o'clock in the morning, as previously announced, they will start at ten o'clock at night.

Another important change intended to make the contest safer is the use of controls at intermediate points, as well as observers and a pace maker. The pace making car will be accompanied by a member of the committee and will not be driven faster than the legal limit. Passing the pace maker disqualifies a contesting car. There will be controls at the start, at Rochester, N. H., at Bretton Woods, the turning point, and at Concord, N. H. on the way back, with a final control at Boston. Penalties will be inflicted for arrival at controls ahead of or behind time. The course is through Lynn and Salem to Newburyport, Portsmouth, Rochester, the Ossipees, Intervale, Crawford Notch to Bretton Woods, where an hour's stop will be made. On the return trip the cars will pass through Bethlehem, Franconia, Profile, Plymouth, Concord, Manchester, Nashua and Lowell.

NEW JERSEY A. C. SUMMONS E. R. THOMAS.

NEWARK, N. J., Sept. 21.—The trustees of the New Jersey Automobile and Motor Club at their last meeting passed a resolution censuring E. Russell Thomas, the New York banker, for his reckless driving, which resulted in the accident at Long Branch August 14. Continuing, the resolution summoned Mr. Thomas to appear before the board on the evening of October 5 to show reason why he should not be expelled from the club. Mr. Thomas is still confined in the hospital.

POSTER FOR THE PALACE SHOW.

The show committee of the American Motor Car Manufacturers' Association has made its selection of the pictorial posters for the Ninth International Automobile Show at Grand Central Palace, New York City, which opens on New Year's eve. It consists of a five-color drawing on big twenty-four sheet poster of a large red car shooting through an imaginary sky, leaving behind a trail of lurid yellow, giving the poster an unusual amount of life and action. On the yellow tail of the comet are printed in red the words Ninth International Automobile Show. The contract has been given to Seiter & Kappes to produce this as soon as possible. Besides this large poster the committee has artists at work on a smaller one to be in seven colors.

POPE REORGANIZATION WELL UNDER WAY.

HARTFORD, CONN., Sept. 14.—According to present indications, it now appears that the reorganization of the Pope Manufacturing Company will be consummated by November 1. The report of the receivers for August, recently filed with the Superior Court, shows the cash receipts to have been $54,943.66, disbursements $66,776.30, and the sales $43,041.12 during that month. To quote Albert L. Pope, one of the receivers: "The plan of reorganization is now assured of success and it will be completed within a very short time." The final proceeding of the receivers will be to apply to the courts for authority to sell the plant to the committee of reorganization.

ANNUAL MEETING YORK MOTOR CAR COMPANY.

YORK, PA., Sept. 14.—At the annual meeting of the York Motor Car Company, builders of the Pullman car, the stockholders elected the following officers: President, S. E. Bailey, Philadelphia; vice-president, T. C. O'Connor, New York; secretary and treasurer, Oscar Stevenson, New York; general manager, J. A. Kline, York, Pa. In addition to the above, the following stockholders were present at the meeting: J. C. Schutte, Lancaster; W. F. Lebzetter, Lancaster; John Smith, Lewiston, Me.; A. W. Sechrist, J. E. Crimins and Geo. F. Ryan, of York.

That the automobile trade is a good one was again evinced by the fact that the company was able to declare a 6 per cent. dividend on the $100,000 capitalization. That the business should be able to pay such a large dividend is a source of pride to the stockholders, who attribute the company's success to the efforts of General Manager J. A. Kline to produce a car suited to the public, and the ability of Sales Manager H. R. Averill to sell them. The Pullman line for 1909 has not yet been announced, but the cars which met with such favor this year will probably be continued with little change during the coming season.

HARTFORD TIRE BRANCH MANAGERS CONFER.

HARTFORD, CONN., Sept. 14.—During the early part of the week there was a three-day conference of all the branch managers and field representatives of the Hartford Rubber Works Company, in Hartford. They were all on hand Saturday, and Sunday were taken to New Haven and treated to a typical Connecticut shore dinner by Justus D. Anderson, president of the company. The party included M. C. Stokes, W. H. Reed, Vice-President H. E. Field, Treasurer Henry Plough and J. P. Krough. Two shifts of men have been constantly employed since April 1, and the branch managers have come to familiarize themselves with the plant and its workings. Those attending the conference from out of town were: C. H. Kenyon and A. H. Lowe, of Buffalo; H. F. Kesser, W. Barnes, E. H. Johnanson and F. W. Culver, Philadelphia; E. S. Roe, E. H. Fahy, Harry Snyder, A. D. Creedon and W. R. Brown, New York City; T. H. Wilkinson, Los Angeles; W. H. Bell, D. W. Shattuck, W. B. Powell, H. E. Smith, R. Sillies, J. F. Kerner and G. R. Noble, Chicago; C. Langmaid, S. D. Niles, W. P. Barth, Boston; H. C. Severence, J. J. Tompkins, Detroit, and H. P. Goodale, H. C. McIntosh, Cleveland.

CHALMERS-DETROIT AGENTS GIVE A JOY RIDE.

The Chalmers-Detroit was very happily and hospitably introduced to the New York newspaper men by President Page and General Manager Percy Owen, of Carl H. Page & Company, on Wednesday of last week. This metropolitan "coming out party" of the Chalmers-Detroit took the form of a joy ride with a luncheon as a wind-up. Seven cars made up of a Thomas "40," a "30" runabout and five "30" touring cars carried the thirty odd guests. The caravan ran out Broadway and over the boulevards in the neighborhood of Van Cortlandt Park, winding up the twenty mile run at the Abbey, a resort overlooking the Hudson, where luncheon was served without the boredom of speech-making, beyond a brief exchange of jollies between hosts and guests. After lunch the scribes spent a couple of hours very pleasantly on the lawn before they started on the jaunt home. The Chalmers-Detroit made good in the demonstration.

SELDEN PATENT PAYMENTS SMALL IN AUGUST.

HARTFORD, CONN., Sept. 14.—The report of the business done by the Electric Vehicle Company during the month of August has just been filed. It shows cash sales of $20,231 and purchases of $6,866.66. Of the cash receipts but $143.71 is credited to the Selden patent. The disbursements were $45,483.21, of which $28,002 was paid George B. Selden; cash on hand, $263,900.77.

Goodrich Army of Branch Managers, Salesmen and General Representatives.

These were gathered recently at Akron, O., when the B. F. Goodrich Rubber Company had its meeting, at which the policy for the coming year, reduction of prices and other matters of interest were discussed and decided upon.

White Steamer Trying Out a Stretch of the Vanderbilt Cup Course.

Stewart Speedometer Announcement.—The Stewart & Clark Manufacturing Company has been "sitting up nights with its eye on the 1909 season," according to its own admission, and promises one of the best propositions ever made in the accessory industry. No outsiders have as yet been let into the secret, but it will be made public within a few days. The Stewart & Clark Company has been specializing in flexible shafts for thirty years and operates what is claimed to be the largest factory in the world devoted to this line, that of the Chicago Flexible Shaft Company. Another exclusive feature of the 1909 line will, of course, be the Stewart swivel joint. The popularity of this instrument is attested by the enormously increased output during the last season; even in England it found immediate favor and became at once a dangerous competitor to the home product. Perhaps part of this success may be due to the five-year ironclad guarantee whicb has from the first covered all Stewart instruments.

Factory Dining Room.—The Geo. N. Pierce Company, of Buffalo, has put in operation a plan which it says is working admirably. On the top floor of the new office building the company has provided a dining room which has the capacity for seating 800 people at once. The workmen reach this room by passing through a tunnel from tbe shops and an elevator to the top floor. A large kitchen and ample help has been provided, and the men secure their dinner for a nominal sum with much less trouble than before. The officials of the company have a clubroom on the second floor of the building, where they gather for their midday meal. On the second floor will also be found light and roomy offices, reception room, library and other rooms. The basement bas been fitted up with locker rooms and wash rooms for the men.

The Pope-Waverly Makes a Record.—At the Indianapolis factory of the Pope-Waverly Company recently a test was wanted on one of the stock batteries for mileage and general service. A battery was installed in a stock car, Model 70B, and an office man was sent out with orders to run it down. He was given a definite route, selected for its average condition, and started from the factory at 1 o'clock. On his return at closing time he had covered 62 miles that day. The car was locked up where no one could meddle with it during the night, and the next morning he was again started out. When he next showed up he had covered a total of 142 miles and the car was still running smoothly, seemingly capable of at least five miles more.

Largest Industry in Syracuse.—The automobile business in Syracuse has increased so rapidly in the past few years that now the largest single industry in the city is the H. H. Franklin Manufacturing Company, having done a business of over $4,000,000 during the year ending Sept. 1. Of this amount brought to Syracuse by the Franklin Company a goodly percentage of it has been placed in circulation in wages to the 1,500 employees. What this does for the merchants of Syracuse is only one example of what the automobile industry is doing throughout the country for business in general, as this record of the Franklin is but one instance of many to be found in the American auto trade.

Pope Indianapolis Plant Sold.—No objection having been raised to the proposed sale of the Indianapolis plant of the Pope Motor Car Company, where the Pope Waverley electric vehicles have been manufactured, Vice Chancellor Howell, sitting at Newark, N. J., granted the necessary authority to consummate the sale. The consideration was $200,000 and it is understood to cover all the assets of the company, outside of the cash in bank, including all patents, copyrights and the like, a forfeit of $5,000 being deposited by the bidders, Herbert H. Rice and Wilbur C. Johnson.

Rambler Plant Growing.—Thomas B. Jeffery & Company is about to make the seventh annual addition to the Rambler factory at Kenosha, Wis. Ground has been broken for a concrete building, 257 by 150 feet, which will give an additional floor space of 38,500 square feet. The new building will be used by the final test department. Every year of the past seven has seen some large addition to what the Rambler people now claim is the largest automobile factory in the world. The latest photograph of the plant, below printed, shows its vast extent to a nicety.

A Winton Labor Day Tour.—A. S. Gilman, of Cleveland, drove his Winton Six from that city to Cambridge Springs, Pa., and back last Labor Day in ten hours' running time, without any attempt to make speed. The car carried ten passengers all the way. "I will certainly enter my car in the Winton prize contest this Fall," said Mr. Gilman. "I ought to have entered the first contest, and the car would have been a winner, too, for I have done 8,000 miles in it with practically no repair expense at all."

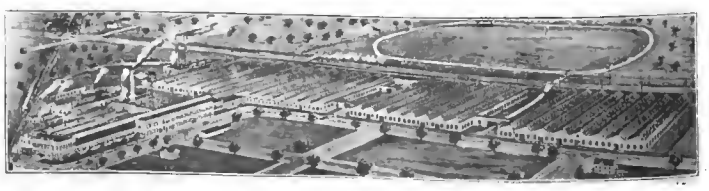
Hot Engine Club Toast.—From A. U. Jervis comes the following: "At a recent luncheon of the Hot Engine Club in New York the following toast was proposed: 'The good people of Savannah, Ga., and the good people of Lowell, Mass., let us drink to them and hope they will get all that is coming. Mr. Morrell has promised the good people of Savannah a race this year and he has promised the same race to the good people of Lowell for next year. God bless the good people; drink hearty.'"

New York's Newest Garage.—The Apthorp Garage, 214-216 West Eightieth street, at Broadway, was opened September 14 for the storage of private automobiles. The building is a modern structure, absolutely fireproof, six stories in height, and will be conducted on up-to-date principles and equipped with all the latest appliances for the comfort and convenience of automobile owners. The machine shop will be complete in every detail. Frederick Dickinson is in charge.

Walter Christie Automobile Company.—The latest recruit to the ranks of automobile manufacturers in this country has come forth in New York City under the above title. Tbis company has been formed with a capital of $400,000, and it proposes to manufacture motors, automobiles, carriages and trucks. Incorporators: Van S. Howard, C. Colgate Moore, G. W. Moore, Morris Gest, Louis P. Strang, Samuel Bogart, all of New York City, and J. B. Lozier.

Mora Motor Car Company.—The sealed bonnet Mora car which this company drove almost 8,000 miles without the hood being lifted has been sold to H. I. Buttery of Waterloo, N. Y., who decided that in buying a machine he wanted to feel that he was getting a car that has already proven itself worthy. The power plant was placed in one of tbe light-powered touring cars, and the reports from the owner so far indicate that the car is doing excellent work.

Increases Its Capital.—The Auto Body Company, of Lansing, Mich., has increased its capital stock from $25,000 to $150,000, the increase all being subscribed for by the present holders. According to Secretary Bradner, the sole reason is the rapidly growing business of the company, whicb greatly added to its capacity during the past year by new buildings and equipment.



The Big Factory at Kenosha, Wis., Where Ramblers Ars Made.

Stearns Changes.—The F. B. Stearns Company, of Cleveland, has made an announcement which will be a surprise to many. They propose that within sixty days they will be able to give purchasers of the Stearns cars the option of either the shaft drive or a chain drive. The company and sales manager, Charles B. Shanks, still prefer the chain drive, but they realize that all others do not, and to meet the demand have undertaken this policy.

Truffault-Hartfords at Lowell. — In speaking of the mechanical constitutions of the cars which participated in the 250-mile road race at Lowell, Mass., on Labor Day, mention was made of the fact that the Simplex, No. 1, was equipped with Truffault-Hartford shock absorbers, but the fact that the winning Isotta, driven by Strang, as well as the No. 2 Fiat, handled by George Robertson, were also similarly equipped was overlooked.

Another Sign of Prosperity.—The Speedwell Motor Car Company, of Dayton, O., has started work on the foundations of another new building 50 feet by 150 feet. This is the ninth building to be erected under the administration of General Sales Manager Loomis, who states that over half the product for 1909 has been contracted for. If this company keeps on, it bids fair to be one of Dayton's largest industries.

White Wins in South Carolina.—Columbia, S. C., had its first automobile race meet Labor Day on the mile track at the fair grounds, with over 2,000 people present. The principal event, the 25-mile free-for-all, for the Board of Trade cup, was won by a 30 horsepower White Steamer, driven by R. D. Lambert, his time being 30 minutes 30 seconds.

Avery Gas Company Moves.—The Avery Portable Lighting Company, maker of Avery gas tanks, has moved its general offices and sales department from 18-20 Martin street to 461 Broadway, Milwaukee, Wis. The factory will remain at the Martin street location until the new plant now under construction is completed.

De Palma Used Continentals.—When Ralph de Palma drove his Fiat to the new one-mile world's circular track record at Minneapolis, September 5, he used Continentals. His mark of 51 seconds is likely to stand for some time.

IN AND ABOUT THE AGENCIES.

Cadillac.—The Cadillac Motor Car Company, Detroit, Mich., has made preparations for the removal of its local branch in that city from 256 Jefferson avenue to 1403 Woodward avenue.

Schacht.—B. Applegate & Company, 326 Broad street, Philadelphia, have just been appointed agents for the Invincible Schacht high-wheel runabout in the Quaker City and adjacent territory.

Elmore.—The new Elmore agency garage, which is to be built at 742 South Olive street, Los Angeles, Cal., is now in course of construction. It will house a salesroom, garage, repair shop and office.

Gove Automobile Company.—Wisconsin State agents for the Regal, and which also has the agency for the Jackson and the Brush cars, has just moved into its new establishment at 52-56 Biddle street, Milwaukee.

Premier.—Webb Jay has just been appointed local agent in Chicago for the Premier car, made by the Premier Motor Manufacturing Company, Indianapolis, Ind. Until recently the Walden W. Shaw Company was the exclusive agent for the Premier.

Oldsmobile.—The Oldsmobile Company, of New York, has leased the building at 251-253 West Fifty-eighth street, and will have it altered into a garage at a cost of $30,000. Plans have already been drawn by Cowen & Company and work will be begun at once.

Stevens-Duryea. — The Tufts-Justin Company, which was recently appointed local agents for the Stevens-Duryea cars in Providence, R. I., to succeed the Snow Automobile Company, will remove into new quarters in the Dutee Wilcox Building at Aborn and Washington streets as soon as alterations are completed.

Monarch Motor Car Company.—Word comes from Chicago that the Monarch Company has just established three new agencies as follows: J. E. Garnett, Kan., with headquarters at Wichita; G. Ludemann, Northeastern Iowa, headquarters at Parkersburg; H. M. Martinstein, Colorado, headquarters at Denver.

Chalmers-Detroit.—The Chalmers-Detroit car will be handled in Baltimore by the Zell Motor Car Company. This company, only recently organized, has E. Stanley Zell, former secretary of the Motor Car Company of this city, as president of the new firm. They have opened up temporary quarters at 1010 Morton street.

Stewart Speedometers.—Word comes from Chicago that the Stewart & Clark Mfg. Co., of that city, has established its New York office in the Motor Mart Building, 1878 Broadway. On the first floor a complete line of Stewart instruments will be on hand at all times, while basement facilities have been provided for making any adjustments or for installing instruments.

F. B. Stearns & Company.—Although the Stearns Company has been doing an increasing business for years, this does not seem to satisfy the new sales manager, Chas. B. Shanks. Heretofore almost the entire Stearns output has been disposed of in the East, but the few cars that this company has sold west of the Mississippi have been so well received that Mr. Shanks has started on a tour of the West to stir up all the Stearns agents to renewed activity. In anticipation of the growing demand for Stearns machines the company is making extensive additions to their Cleveland plant, both in floor space and machinery. The present plant has been working to its full capacity for two years with both a day and night shift, so means for increasing the force of men was the only means of enlarging their output.

PERSONAL TRADE MENTION.

Curtis W. Betts, formerly on the sales staff of the Mitchell Motor Car Company, of Racine, Wis., has joined the forces of the Peerless Motor Car Company, Cleveland, O.

W. W. Taxis, who has been with the New York office of the White Company, and well known to the automobile trade, has been appointed manager for the company in East Orange, N. J.

F. C. King, who was formerly connected with the F. B. Stearns Company, Cleveland, O., has been appointed manager of the repair department of the Metropolitan Motor Car Company of the same city.

Leon Rubay, well known to the automobile trade as an importer of foreign sundries, has taken charge of the wholesale department of Rothschild & Company, 530 West Twenty-seventh street New York City, builders of auto bodies.

C. D. Snow, formerly head of the Snow Automobile Company, Providence, R. I., is now connected with the American Locomotive Automobile Company at its Providence selling branch. Mr. Snow had the Stevens-Duryea agency in Providence for six years

B. F. Adams, who has been acting as manager for Carl H. Page & Company, agents for the Peerless, in Newark, N. J., has severed his connection with that concern to go with the Ellis Motor Car Company. Mr. Adams was with the White Company formerly.

R. M. Daniels, manager of the Studebaker branch in Boston, will in future also look after the interests of the new E-M-F car in that territory, under the terms of the recent agreement between the E-M-F and the Studebaker companies by which the latter is to market half the product.

The Men Who Sell Chalmers-Detroits in New York

President Carl Page (at wheel) and General Manager Percy Owen of Carl H. Page & Co.

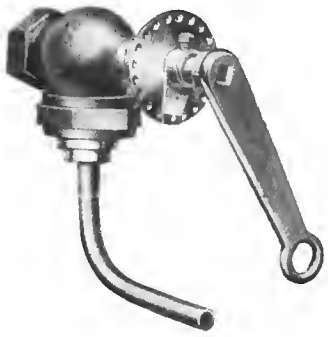
George H. Strout, the sales manager of the Apperson Brothers Automobile Company, left Kokomo Sept. 11 on his annual trip to the Pacific Coast in the interests of the company. He will visit the principal cities in Colorado, Utah, California, Oregon, Washington, Montana, Minnesota and Wisconsin before returning to the factory.

C. B. Warren, for the past five years associated with the Haynes Automobile Company, Kokomo, Ind., latterly as sales manager, has resigned, effective October 1, and will take charge of the Pacific Coast business of the F. B. Stearns Company, of Cleveland. The Stearns Company will open a branch in San Francisco with Mr. Warren in charge to supply the trade on the coast, Salt Lake City being the eastern limit of Mr. Warren's jurisdiction.

Frank Staley, president of the Indianapolis Automobile Trade Association, has disposed of his business interests in Indianapolis and will take an extended trip through the West. Mr. Staley has been with the H. T. Hearsey Vehicle Company for the past fourteen years, and for the last decade has been its vice-president and general manager. For many years the company handled carriages and bicycles, and later automobiles were added, this branch of the business having been largely developed by Staley. His interests have been taken over by Fred I. Willis.

INFORMATION FOR AUTO USERS

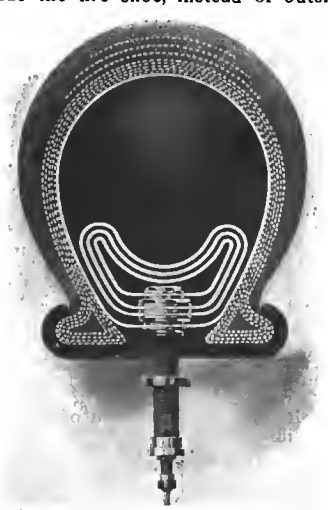
Indicator for Gas Tanks.—The Avery Portable Lighting Company, of Milwaukee, Wis., have recently put upon the market a little device for the users of gas tanks. It is a very simple arrangement which can be attached to all makes of tanks for regulating the amount of gas to turn on. As will be noticed in the



GRADUATED INDICATOR FOR VALVES.

accompanying illustration, there is a dial on which travels a pointer. This pointer is so made that it fits into any of the notches shown on the dial and gives a clicking sound when moved, so that at any time, day or night, the user may turn on the gas and know just how much he has opened the valve, two notches being plenty for two lights.

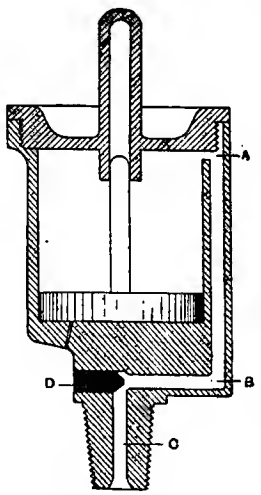
Guaranteed Faultless Inner Tube.—An ingenious solution of the tire problem appears in this product of the Guaranteed Faultless Auto Tube Company, 104 West Forty-second street, New York. The idea is that spare inner tubes should be carried inside the tire shoe, instead of outside,



"FAULTLESS" TUBE, ONE INFLATED.

thus obviating the necessity of removing the shoe whenever it is necessary to replace a punctured tube. The "Guaranteed Faultless" tube therefore consists of four tubes, one inside of the other, arranged so that each can be inflated in turn by rotating the valve stem a notch. When a tire is punctured all that is necessary is to give the valve stem a twist, connect the pump, and inflate the next tube. When all four tubes have been punctured—which should not happen for many thousand miles—the company will repair and vulcanize the tubes free of charge. The device promises to save much time and trouble in touring. The arrangement of the tubes and valves is clearly shown in the cut.

New Loose Pulley Oil Cup.—The accompanying cut shows a newly patented oil cup for use on loose pulleys. This device, made in two sizes, is manufactured by the Lawson Manufacturing Company, Buffalo, N. Y., and is claimed to solve the loose pulley problem, viz., keeping the loose pulley well oiled while in operation. It is the only cup of its kind on the market and should be a great saving, not only to the large number of manufacturing plants in the country, but to the increasing number of automobile



SECTION LAWSON OIL CUP.

owners who have had trouble keeping the clutch collar from heating.

The cup consists of three distinct parts: A body, piston or plunger, and an oiltight cover. The cup is filled with ordinary lubricating oil by removing the cover, first making sure that the plunger is pushed clear down. The stem of the cup has standard pipe threads which screw into the hub of the pulley.

Its operation is very simple. The rapid revolving of the pulley causes the loose piston to be forced outward by centrifugal action, thus requiring the oil to flow through the bi-pass A-B-C (see sectional drawing) to the shaft. The flow of the oil is controlled by the screw D and must be regulated according to the speed of the pulley. When the pulley stops oiling ceases at once.

Graphlio.—This new lubricant is being marketed by the firm of Walter D. Carpenter Company, 39 Cortlandt street, New York. It has been known for years that flake graphite possessed lubricating qualities of great value, but there was always the difficulty of getting it in fine enough form and at the same time free from all impurities, as to enable it to be used in combination with a liquid substance and remain in suspension. In Graphlio this firm claim to have surmounted all these difficulties, and such being the case, it should be of inestimable value to the automobile trade through its better and more efficient lubrication. It is sold in 10-oz. cans, which is sufficient to graphitize 15 gallons of oil.

"Triumph" Gasoline Gages.—These gages, for use in portable and stationary tanks, automobiles and motor boats, are the product of the Boston Auto Gage Company, Boston, Mass. In all types the pointer is magnetic and is controlled by a magnet carried on the float inside of the tank. The float is mounted in such a way that it must revolve as it rises or falls with the level of the liquid, and the magnet causes the pointer to revolve to correspond. There is no communication between the inside of the tank and the head of the gage, and if the gage glass should accidentally be broken it would be impossible for gasoline or air pressure to escape. Another form of the gage is arranged so that the dial may be mounted on the dash; this is known as the "tankoscope." The dial is made to represent the shape of the tank, and is arranged so as to show just where the gasoline level is inside, instead of using figures. It is practically the same as having a glass front in the tank.

TRIUMPH "TANKOSCOPE."

New Pittsfield Jewel Magneto Plug.—The Pittsfield Spark Coil Company, of Dalton, Mass., have brought out a spark plug which they have constructed especially for use with magnetos. This plug, called the Pittsfield Jewel double-spark

JEWEL DOUBLE SPARK PLUG.

plug, has been made with two gaps, as shown in the accompanying cut. This gives a double volume of spark, making more certain the complete explosion of the charge, even should the mixture become poor. The insulation of this new plug is the same as that used on the Pittsfield plugs manufactured heretofore by this firm.

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THE AUTOMOBILE

After Leaving Amagansett on the Road Across the Meadow to Montauk Point.

MANHATTAN'S "Automobile Row" had an enjoyable two days' outing on Long Island on Wednesday and Thursday, September 16 and 17, in which a considerable contingent of pleasure seekers, regularly entered as tourists, or volunteering for official duty, participated. The excuse for the happily conceived and well received junket for the tradesmen and their friends and all comers was by name a "two-day mechanical efficiency motor car test and run around Long Island." It was the conception of W. J. Morgan, who, in the interim of newspaper work, finds time to discover Ormond, to get cars to climb to the clouds, to persuade motor boats to cross the Gulf Stream to the Bahamas, and to suggest unending stunts to automobilists seeking for novelty and excitement.

The New York Automobile Trade Association saw a holiday ahead and readily consented to the event being run under its auspices. It duly appointed Morgan its manager and the "Senator" set Alex Schwalbach to work at the details and framing up a set of rules that would afford an acceptable and not too strenuous schedule and regulations that would not interfere too much with the holiday spirit of the affair. Schwalbach took an experienced tour manager and follower, R. H. Johnston, into consultation, and between the two they evolved an adequate set of rules. In brief, tardiness at controls lost a point per minute, and work on repairs, replacements, or adjustments a point per minute per man engaged, with no penalization for tire repairs.

Everything went off as merrily as a marriage bell. Every one was so "delighted" and had such a "bully good time" that Morgan's latest stunt was unanimously voted well worthy of annual repetition as a scheduled autumn trade outing. While the selling fortune of no make could be said to have been made, it is equally true that no serious damage was done any particular brand of automobile by the outcome of the run.

What more inviting two days' jaunt could be offered a New Yorker at his very doorstep than a two days' jaunt around Long Island? There was enough of cool autumn twang to the air to make the ride exhilerating. The first day's run was along the south shore, after a pretty ride through Bay Ridge, Bensonhurst, Bath Beach, over the boulevard along New York Bay. Then came the Merrick road, which further on becomes the South Pike, running through fashionable Babylon, Bay Shore and Islip, to the Hamptons and the picturesque Shinnecock Hills, with their quaint windmills and unique villas nestling on the sand dunes, and winds up at Amagansett. Break the run with a beefsteak dinner taken *al fresco* at Ye Anchorage Inn at Blue Point and one can ask for no prettier day's jaunt from the environs of the metropolis.

It would not have been Morganesque, however, to have furnished no spicier touring menu than such a peaches and cream jaunt over level macadams and smooth gravel highways as the run from Brooklyn Bridge to Amagansett. From this point as a *pièce de resistance* he had prepared a road tussle over a practically untraveled stretch of wild country to the eastern end of Long Island, where the Montauk Point light casts its ray over the conflux of sound and ocean. It was an almost pathless run for thirteen miles, at times through deep sand, at all times through some sand, and at some times with pretty stiff grades up the dunes and larger hills added. Troubles soon began and before the night was over in some cases they had developed into a series of real adventures.

It was well on toward sunset when the caravan entered the desert, with schedules varying from 50 minutes for the large to 59 minutes for the small cars in the run. The Amagansett turnpike had not been left many miles behind before cars began to be stalled and in turn to stall others following imprudently close behind them. It was a case of keep one another, for it was no easy task to pull out of the rut and around. It was soon realized that time was short and then hurry was the order of the day. Fair passengers got a merciless jolting and masculine live freight got a pretty bad shaking up. To add to the schedule making difficulty in such a waste there were few landmarks and cars went astray following the wrong trails. So it was that only about half of the cars got through on schedule and a majority of them made it with the narrowest of margins.

Two cars met with casualties in the battle through the sand that put them out of the run. H. M. Casbrunt's Lozier broke its differential in a rut and incidentally stripped its gears in endea-

Gathered in the Shadow of Montauk Light.

Pacemaker at Vanderbilt Crossing, Near Oakdale.

Signs Which Marked the Route of the Run.

A Good Samaritan Whose Help Was Appreciated.

voring to extricate itself. A farmer was fortunately found to tow the car to Amagansett. A Stoddard-Dayton, piloted by R. L. Newton, was less fortunate. It broke a wheel and had to be abandoned until the arrival of a new wheel the next day. It had two ladies aboard. R. M. Owen insisted on starting back at 10 o'clock in the Reo to rescue the stranded party, but missed them in the dark. In the meantime they had started to walk to Montauk Inn. They followed the railroad tracks some of the way and reached the inn at midnight. Belated and lost cars straggled in all during the evening and night.

At a meeting of the committee to consider the cause of the delayed cars, it was leniently and diplomatically decided by Morgan and his advisers to call off the sand battle altogether and make Amagansett the end of the first day's control. There was no little kicking, as might be expected, from those cars that had survived the run through the sand, the only real test of the day.

The early arrivals preempted all the rooms at the inn not set apart for the ladies. The others to the number of close to 150 were forced to find their way as best they could to the steamer *Shinnecock*, which was moored at the dock, having been chartered to accommodate the overflow. The wind came up and became almost a gale. The boat rocked and banged against the dock, so that little rest was had in the four-dollar berths. Many were too sick to enjoy very much either their "dollar and a half" dinner or their "dollar breakfast." The favored inmates of the Inn, at $3 for a comfortable bed, a good dinner and a refreshing breakfast, were much envied.

The caravan got away from Columbus Circle at 7:20 A. M. on Wednesday, proceeded down Broadway, across Brooklyn Bridge, and along the Bay boulevard to the Crescent Athletic Club at Bay Ridge, where they checked out and were sent on their journey by Fred J. Wagner.

The cars were classified as follows: Class A, cars selling for $850 or less; class B, cars selling for $851 to $1,250; class C, cars selling for $1,251 to $2,000; class D, cars selling for $2,001 to $3,000; class E, cars selling for $3,001 to $4,000; class F, cars selling for $4,001 and over; class G, taxicabs carrying two passengers and driver.

The participants in the run were 28 contestants and 8 tourists, besides a half dozen official cars, making some 42 cars in all.

Contestants.

Class.	Make.	Driver.	Entered by
A	Cadillac	E. H. Brandt	Detroit-Cadillac Motor Car Co.
A	Maxwell	F. O. Hinhauser	Maxwell-Briscoe Motor Co.
A	Reo	J. W. Gogarn	R. M. Owen & Co.
A	Ford	Frank Dunnell	Ford Motor Company.
A	Brush	W. W. Price	Brush-McLaren Motor Co.
B	Reo	R. M. Owen	R. M. Owen & Co.
C	Maxwell	C. D. Kelsey	Maxwell-Briscoe Motor Co.
C	Mitchell	O. R. De Lamater	Mitchell Motor Co.
C	Mitchell	W. D. Brown	Mitchell Motor Co.
C	Chalmers-Detroit.	William Knipper	Carl H. Page & Co.
D	Mitchell	C. A. Kirchhof	C. A. Kirchhof.
D	Apperson	Sidney B. Bowman	Sidney B. Bowmsn Co.
D	Oldsmobile	F. G. Falberth	Oldsmobile Company of New York.
D	Stoddard-Dayton	A. H. Whiting	Atlantic Motor Car Co.
D	Pullman	Paul Cimlotti	Cimlotti Bros.
E	Mora	W. W. Burke	W. W. Burke.
E	White	Charles Lowd	The White Company.
E	Stevens-Duryea	Carl Relchenbach	International Generstor Company.
E	Stevena-Duryea	Frank Eveland	A. G. Spalding & Bros.
E	Stevena-Duryea	L. Young	Stevens-Duryes Co.
E	Lancia	C. H. Tangemann	The Hol-Tan Co.
E	Locomotive	P. J. Johnson	American Locomotive Company.
F	Rainier	Mrs. Joan N. Cuneo	Mrs. Joan N. Cuneo.
F	Rainier	L. A. Disbrow	Mrs. Joan N. Cuneo.
F	Zust	V. P. Pisani	American Zust Motor Company.
F	Acme	J. W. Mears	J. W. Mears.
F	Lozier	C. A. Emise	Lozier Motor Co.
F	Locomotive	H. C. Townsend	American Locomotive Company.

Touring Division

C	Maxwell	Mrs. J. R. Ramsey	Mrs. J. R. Ramsey.
C	Autocar	Frank A. Burrelle	Frank A. Burrelle.

Gathered at Columbus Circle, New York City, in the Heart of the Automobile District, for the Early Morning Start.

D Haynes .....W. E. Shuttleworth...W. E. Shuttleworth.
D Oldsmobile .....W. J. Wyatt.. .....Oldsmobile Company.
D Stoddard-Dayton..R. Newton .....Atlantic Motor Car Co.

F Stevens-Duryea....C. M. Louther.....C. M. Louther.
F Lozier .....H. M. Casbrunt.....Lozier Motor Co.

Sp'l Lancia .....Harry Fosdick.....The Hoi-Tan Co.

The first day's run was 144.4 miles from Brooklyn Bridge to Montauk. The checking stations were at Lynbrook, 34.5 miles; Blue Point, 73 miles; Southampton, 115.2 miles; Amagansett, 131.6 miles, and Montauk Inn, 144.4 miles. The schedule called for 19 miles an hour for cars over $2,000 and 17 miles for cars under that price all the way to Amagansett, and for 15 and 13 miles respectively for the 13-mile sand battle.

The start on the second day was made sharp at 7:30 A. M. It began with a run of 6.5 miles to Montauk lighthouse, which raised the distance of the run back to Amagansett to 25.8 miles. The Stevens-Duryea "Big Six" burned out its clutch in the run to the lighthouse and was delayed at the Inn until the next day.

Wednesday's route was retraced as far as Good Ground, 49.8 miles. It here turned north to Riverhead. There the Suffolk County Fair was visited and the track was circled three times. The next checking point was Stony Brook. The run then followed the north shore, whose hills gave the cars a bit of a hill-climbing tryout, with a checking station at Oyster Bay. The last checking station was at Flushing, 154.5 miles. From this point the cars ran as they pleased, via Astoria ferry, to the Automobile Club of America clubhouse, a distance of 9.4 miles, having run 315 miles in the two days.

The Official Results from the Committee.

At a meeting of the contest committee on Tuesday, the following cars were announced as having clean scores, both mechanically and on the time schedules, for the two days' run:

CONTESTING DIVISION.

Class.	No.	Make.
A	1	Cadillac.
A	3	Maxwell.
A	11	Reo.
A	22	Ford.
B	6	Reo.
C	14	Chalmers-Detroit.
C	35	Mitchell.
D	9	Mitchell.
D	10	Apperson.
D	15	Oldsmobile.
D	34	Stoddard-Dayton.
D	40	Pullman.
E	5	Mora.
E	12	White.
E	25	Stevens-Duryea.
E	29	Stevens-Duryea.
E	31	Locomotive Taxicab.
F	7	Rainier.
F	8	Rainier.
F	20	Zust.
F	21	Acme.
F	30	American Locomotive.

TOURING DIVISION.

Class.	No.	Make.
C	36	Maxwell.
D	2	Haynes.
D	16	Oldsmobile.
Spl.	13	Lancia.
Spl.	4	F-H Motorcycle.

In the contesting division, No. 4 Maxwell was disqualified for taking the wrong road from Montauk lighthouse back to Montauk on the second day. No. 18 Stevens-Duryea, entered by a private owner, was penalized 105 points for ignition troubles. Mitchell No. 26 was penalized 125 points, an oil feed pipe becoming clogged on the second day. No. 39 Lozier was disqualified and the driver disbarred from competing in future events under the auspices of the association for leaving the noon control at Blue Point without checking out.

The following cars dropped out at various times, but finally reported at the clubhouse after the time limit had expired:

No. 28 Lancia, No. 32 Brush, No. 24 Stevens-Duryea, No. 33 Stoddard-Dayton, No. 37 Autocar.

At an early date the certificates and medals will be presented at the clubhouse of the Automobile Club of America, to which function the automobile trade of New York will be invited. A musical program will be arranged, besides the luncheon for all.

One of the Most Enjoyable Features of the Run Was the Stop at the Typical Country Fair at Riverhead, L. I.

PREPARATIONS FOR A. M. C. M. A. SHOW PROGRESSING

IN order to complete final preparations for the first big show of the year, that of the American Motor Car Manufacturers' Association to be held at the Grand Central Palace in New York, December 31-January 7, 1909, there will be a meeting of the Committee of Management of the A. M. C. M. A., Tuesday,

Design for Main Entrance Grand Central Palace Show.

October 6, at 10 A. M., while the Show Committee will meet Tuesday and Thursday, October 6 and 8, at the same hour. All applications for space must be received at the New York headquarters, 29 West Forty-second street, by October 1, and those in hand by that date will be treated alike, while subsequent applications will be given consideration by the Show Committee, following the drawing and allotment of prior applications. To pass upon the latter, Chairman H. O. Smith, of the Show Committee, has set the following dates: Members of the A. M. C. M. A. will draw Thursday, October 8 at 10 A. M., while the allotment of space to automobile manufacturers who are not members of the association will be made the same day at 2:30 P. M., and that to makers of accessories who are not members of the Motor and Accessory Manufacturers' Association, will be made at 5 P. M.

The event will be known as the Ninth International Automobile Show, and it is quite probable that the S. R. Ball Company, long identified with the decoration of the Garden shows, will be awarded the contract for beautifying the Grand Central Palace. The latter is a very much more difficult structure to handle in this way, but it is said that the plans contemplate so complete a transformation of the interior, as well as part of the exterior, that those familiar with the Palace will hardly recognize it. Four designs have been submitted by leading decorators, but after several weeks' deliberation, the Show Committee has about settled upon the Ball plan, although it is the costliest. While full details are not available at the moment, it is said that the decorative scheme is borowed from an early English period. Pillars and balconies will be a feature, open beam construction being employed in connection with ornamental stucco. The main galleries will be white and sap green, relieved by gilt signs, while the ceiling of the main auditorium will be covered with an Italian sky-blue fabric, a garden with statuary, mirrors and a profusion of plants, occupying what is ordinarily the stage. A series of paintings will be run round the entire balconies, the subjects being taken from recent automobile contests.

Doubtless the greatest change in the building will be found in the outside, the porte cochére being decorated with ornamental cast figures, balustrades, electric signs and a large painting, the whole being brilliantly illuminated with search lights, in order to advertise the presence of the show. In place of the customary floor covering, a heavy fabric with liberal under padding will be employed, and there will also be a departure noticeable in the draperies of the accessory division, an entirely new arrangement of silkoline back draperies being outlined with a unique electrically illuminated sign, supplemented by satin banners.

Both the automobile and accessory exhibitors will be supplied with glass signs and pennants holding electric lights, the whole being mounted upon ornamental pillars. The specifications call for ten six by eight-foot statues throughout the building, and something like 10,000 electric lights for the decorative lighting.

PERFECTING PLANS FOR THE NINTH LICENSED SHOW

THE Show Committee of the A. L. A. M. met last Monday to consider plans for the Ninth National Show of the licensed manufacturers, which will open January 16 in Madison Square Garden. There were present Chairman George Pope, Marcus I. Brock, M. L. Downs and E. P. Chalfant.

Arthur N. Jervis was again appointed press agent of the show, and the contract for advertising was awarded to Lord & Thomas. The committee then took up the matter of decorative lighting, with the idea of introducing some novel effects.

Spaces were allotted to exhibitors in the commercial vehicle department, but it was necessary to postpone allotments in the electric division in order to arrange if possible for the room to accommodate the extraordinary demand. The headquarters of the committee during the show will be at the Hotel Breslin.

CONCERNING STIFF AND WEAK VALVE SPRINGS.

Stiff valve springs may close the valves with so much force as to break the heads from the stems, or they may break the stems at the key slots. Springs too weak to hold the valves or the cams will make the engine weak at high speeds, and will produce clattering owing to belated seating of the valves. If the springs are too stiff, and are shortened, the cut ends must be turned flat, which necessitates heating them in a fire and afterwards retempering.

PHILOSOPHY OF DRIVING A BOLT HOME.

When a bolt on which a nut is to be screwed sticks before it is fully introduced in its place, do not attempt to force it home by tightening on the nut. Drive on the bolt head with a hammer while the nut is being tightened, and strain on the bolt will be avoided. It is an excellent plan in many places to apply a paste of grease and graphite to the bolt threads before screwing on the nut. This makes the end easy to turn and gives protection against rust.

The Engineers and Their Hosts of the Diamond and Goodrich Companies at the Akron Country Club.

AUTOMOBILE ENGINEERS ENJOY OHIO HOSPITALITY

By CHARLES B. HAYWARD.

CLEVELAND, Sept. 19.—From early Friday morning until to-night, when the third quarterly meeting of the Society of Automobile Engineers formally broke up with the conclusion of the dinner tendered to the members by the Timken Roller Bearing Axle Company at the Courtland House in Canton, the visitors have been made to feel every moment of the time that they were in the hands of their friends, and the combined efforts of the entertainers left nothing to be desired. The result was one of the most enjoyable occasions that the members of the society have ever participated in. As the quarterly meetings only extend over two days, the first thing on the program was a number of factory visits during Thursday morning, in order to bring the business meeting and technical sessions in the afternoon. In a number of Winton, Stearns, Peerless and White cars, the party got away from the Hollenden about 9:30, the first plant on the list being the Winton, where the engineers were welcomed by Mr. Henderson. After having spent an hour or so there in examining the various factory methods employed, as well as the details of the design of the new Winton cars for 1909, a number of which were coming through, the cars were again taken for a visit to the plant of the Standard Welding Company, situated in another part of Cleveland.

The invitation to inspect the plant was extended by W. S. Gorton, general manager of the Standard Company, and after having viewed some of the various forms of electric welding as applied to rims, axles and tubular work, the regret that more time could not be devoted to the visit was universal, but in view of the fact that no less than six different plants, situated in widely separated parts of the city, had to be visited in a very limited time, it was impossible to devote more than passing attention to any one of them. From the Standard company's plant the cars were again taken for a visit to the Peerless factory, and at this, as well as at a number of the other plants visited, the fact that the slump of a year ago has been completely forgotten is more than evident in the number of large and permanent additions to the different factories that are now in course of construction, while the manner in which the 1909 cars are already coming through shows that the demand for new machines is making itself felt in no uncertain manner, early in the season. After having spent an hour or so at the Peerless plant, the cars were once more taken, and when the photographer had finished repeating his efforts of earlier in the morning, they were headed for the plant of the Hydraulic Pressed Steel Company, at the invitation of J. G. Foster, one of the members. It was intended to have had some of the special operations of automobile frame pressing on the huge hydraulic presses for which this plant is noted, under way during the visit, but owing to Cleveland's unusually early dinner hour, 11:30, this was impossible.

As a matter of fact, so much more time was spent in visiting than had been allowed for, that at the hour set for the lunch there were still two plants at widely separated points to be gone through, so that at the suggestion of J. G. Sterling, of the Stearns company, and chairman of the local committee, it was decided to omit the visit to the plant of the F. B. Stearns Company, owing to the great distance from the Hollenden. This gave more time to see the workings of the new White plant, though what was left constituted but a fraction of the time that could have been profitably spent there, as it was the universal consensus of opinion that nothing finer in the shape of systematic arrangement and factory organization had been seen. The members were met at the plant of the White company by Windsor and Rollin White, who, together with some of the technical members of the company's staff, acted as guides during the tour of the wide-spreading plant, all of which, with the exception of the large administration building, now nearing completion, is of one story and of the saw-tooth type of construction. The distinguishing feature of the lay-out of the plant, consisting of a 25 by 600-foot skylighted alley, by means of which any one of the numerous departments may be reached without going through any other, came in for a great deal of favorable comment, as did also numerous other features of the carefully arranged factory, which gave evidence of the pains spent in planning it so as to insure not alone the maximum capacity for turning out work, but likewise the greatest comfort and con-

Preparing to Depart from The Standard Welding Plant.

venience for the workmen. An opportunity was also presented to examine the details of the power plant of the White car for 1909, which has been greatly simplified by the adoption of the Joy type of valve gear, this permitting the shortening of the crankshaft to an extent where but two annular ball-bearings are now employed, in place of eight.

Following the visit to the White plant, the engineers were taken back to the Hollenden, where a lunch was served in the dining room of the Automobile Club of Cleveland, at the invitation of E. E. Allyne, of the Allyne Brass Foundry Company, Cleveland, and a member of the Society. Upon the conclusion of this, the members adjourned to the assembly room of the Hollenden for the business meeting and technical sessions.

The meeting being a quarterly one, there was but little routine business to come in for attention, the chief items being the rehabilitation of the committee on international memberships, owing to the resignation of the chairman, and the appointment of nominating and local committees—one to prepare a ticket for the annual election to be held in connection with the fourth annual meeting, which will take place in New York City during the shows, and the other to take up the matter of arrangements and entertaining on the same occasion. In order to provide an opportunity for the greatest possible number of members to attend the fourth annual meeting, both the business meeting and the technical sessions will be spread over two days on dates sufficiently far apart to enable those visiting but one or the other of the shows to be on hand.

Technical Sessions Were Interesting.

The business meeting was followed by the technical sessions, and although the number of papers presented, as well as the time available for discussion, was short, they proved of considerable interest and will doubtless lead to further contributions along similar lines. The first paper was on "The Limitations of the Universal Joint," by H. Vanderbeek, and consisted of a study of the characteristics of this familiar mechanism, as well as its use on the automobile, raising the question of the desirability of one or two universals on the propeller shaft of a car, from a theoretical as well as a practical point of view. In connection with his paper Mr. Vanderbeek had constructed an ingenious model to prove his theories, and this was shown and explained at the conclusion of the discussion, which brought out a number of interesting points.

Following this, there was presented by President Fay a paper on "What Carbon Does to Automobile Steel," in which the author showed at some length the desirability of low carbon steel for automobile work, particularly where dynamic stresses have to be borne, pointing out at the same time the relation of low-carbon, unalloyed steels to both high and low-carbon alloyed steels, where their value for automobile construction was concerned. The subject is one upon which a great deal has been written, though not from this particular point of view, and a discussion of the various points involved could be carried on almost indefinitely.

A paper on the subject of "Power Transmisison on the Automobile" was to have been prepared and read by L. M. Dieterich, but, owing to his illness, he was unable to finish the paper in time for the publication of the Transactions of the Society, or to attend the Cleveland meeting. The third paper presented was entitled "What Is the Best Timing?" and consisted of a translation from the French of *Omnia* (Paris), by Charles B. Hayward. The French author, Louis Lacoin, as the result of the appearance of a device known as the *Larrad*, made a critical study of the requirements of motor valve and ignition timing, comparing them both with the formula prescribed by Larrad, the inventor of the device, as well as with the standards adopted by no less than thirty well-known French builders, who have turned out thousands of motors in the past few years. The principal purpose of the translator was to bring up discussion and lead to further contributions on a subject that has been neglected to a very great extent by the members of the Society in the past, but as the paper itself showed, there are so many points involved, not a few of which require study for their proper consideration, that it is impossible to discuss the subject satisfactorily at any length except in the shape of written contributions, a number of which were promised. Following the conclusion of the technical sessions, the meeting was adjourned to reconvene at a dinner given by the Society to the visiting members, in the rooms of the Automobile Club of Cleveland, in the Hollenden.

A Park Stretch En Route to the Winton Factory.

Program of the Second Day.

At the invitation of the B. F. Goodrich Company and the Diamond Rubber Company the society made a visit to Akron, thirty miles distant, in order to inspect what are said to be the largest rubber works in the world. The concerns in question provided a special car on the electric interurban system, and this appeared in front of the Hollenden promptly at 7:40 a.m., according to schedule. The members were all on hand, and after a pleasant run of a little less than two hours, were landed right at the door of the B. F. Goodrich Company's plant, where a number of the technical staff of the works were impressed as guides in order to give the visitors as comprehensive an outline of the multitudinous operations carried on in a rubber manufacturing plant of such extensive proportions, as was possible in the limited time at their disposal, as both the Goodrich and the Diamond plants had to be visited between 9:30 and 12:30, the hour set for the lunch at the Akron Country Club. Urgent invitations from both the Goodyear and the Firestone companies to inspect the workings of their plants had to be declined for the same reason, as well as the fact that the former had not been received until it was too late to make any change in the plans for the trip to Akron.

The representatives of the local committee, consisting of Chairman Sterling and H. W. Alden, accompanied by Secretary Hayward, made a visit to the plant of the Firestone Tire & Rubber Company, where they were presented with an attractive souvenir in the shape of a neat stop-watch for each of the visiting members. To commemorate the date of the meeting and

visit, the watches are engraved "Firestone, September 19, '08," on the back of the case.

Even by going through "on the high" for every step of the way, it was wellnigh impossible to give the visitors more than a sketch outline of the great variety of rubber "industries" housed in the plant of the Goodrich company. They really deserve this title, as, apart from the fact that the production of an article having rubber as its foundation is the basis of all of them, they not only differ greatly, but require for their housing buildings that are respectable-sized factories in themselves. Needless to add, this is particularly true of the tire end of the plant, where the thousands of solid and pneumatic tires turned out every day have an enormous value. Few, if any, of the members had ever had an opportunity of visiting a tire-making plant, so that the numerous operations, and particularly the preparation of the crude material, was found to be extremely interesting. Starting with the making of solid tires, the visitors were given at least a brief view of every one of the twenty-odd departments, which, in the aggregate, employ between three and four thousand operatives the year round, before bidding farewell to the Goodrich establishment and walking across the intervening space that separates it from the Diamond Rubber Company's works.

It might be thought that seeing one rubber factory was equivalent to seeing all, but where both solid and pneumatic tires are concerned particularly, each plant has methods and arrangements of its own that become of more than the usual interest when contrasted with the different methods of accomplishing the same ends to be seen in the other plants. On this account, it was generally regretted that a whole day could not have been spent in Akron. However, the factories not only close for the day on Saturdays at 11:30, but it was planned to spend the afternoon in Canton, at the invitation of the Timken Roller Bearing Company, a dinner at the Courtland following the inspection of the plant.

At the plant of the Diamond company a good idea was obtained of the various processes through which Diamond tires go before emerging as the finished article, ready to be applied to a car, and the members were greatly interested in the large amount of special machinery used in the manu-

Mr. Henderson of the Winton Company Acts as Host.

The Camera Man Got Busy at the Peerless Plant, Too.

Leaving the White Factory for the Hollenden Headquarters.

The Timken Company Entertained the Engineers During Their Stay in Canton.

facture of other articles of rubber, and particularly that employed for insulating electric cables. Tire-making, as a matter of fact, is almost entirely a matter of hand work, which, together with the high grade of the rubber necessarily employed, accounts for the great expense of manufacture.

Immediately upon the conclusion of the visit to the Diamond plant, a number of cars were boarded for the run to the Akron Country Club, where the members were the guests of the two companies at luncheon. Following this, the special electric car was again boarded for the run to Canton.

At the terminus of the line the visitors were met by a special delegation from the Timken plant, and a number of automobiles, and as a prelude to the visit to the former were given a view of the famous McKinley monument, for which Canton is noted. The various operations involved in the manufacture of the well-known Timken roller-bearings were then inspected, as well as the die-forging of single-piece front axles, manufacture of gears and other processes necessary to the turning out of complete front and rear axle units, the new one-piece pressed-steel trussless rear axle driving unit that is being made for the 1909 model cars coming in for a great deal of favorable attention.

After having made a pretty thorough inspection of the workings of the various departments of the Timken plant, the visiting members were guests of the company at a dinner given at the Courtland house, Canton, upon the conclusion of which the meeting came to an end. A vote of thanks was passed and the secretary was instructed to forward a copy of the resolution to each of the many companies that had done so much to entertain and instruct the visiting members. These included the Winton Motor Carriage Company, F. B. Stearns Company, Peerless Motor Car Company, Standard Welding Company, Hydraulic Pressed Steel Company and the White Company, in Cleveland; the B. F. Goodrich Company, Diamond Rubber Company, Firestone Tire & Rubber Company and Goodyear Tire & Rubber Company, in Akron, and the Timken Roller Bearing Company, in Canton.

ENGLISH DAIMLER ADOPTS KNIGHT VALVELESS MOTOR

CHICAGO, Sept. 21.—Announcement was made to-day by Knight & Kilbourne, of Chicago, manufacturers of the Silent Knight valveless motor, that a deal had been consummated in England by Charles Y. Knight, designer of the engine, whereby the Daimler Motor Co. will equip all its cars in 1909 with the Silent Knight motor. Also it is announced that the same engine will be used by the Minerva people in Belgium, that deal having been closed some time ago. Other foreign concerns are investigating the merits of the idea and it is said it is not at all improbable that the Chicago-made engine will be adopted by some of the leading makers on the continent. At the present time the Panhard people are conducting a series of tests at their factory, and it is said that so interested are the Fiat makers that they have sent their designers to Paris to watch the experiments at the Panhard factory. The makers of the Mercedes, too, have asked to be shown the merits of the idea.

The Silent Knight motor first was brought out in Chicago by Knight & Kilbourne, who put it in the Silent Knight car built by them for a couple of seasons. Early in 1907 Mr. Knight succeeded in interesting the Daimler people in his engine, and last November he went to England to demonstrate it at the Daimler works. He has been there since, in which time the Daimler engineers have gone over the engine, and, while retaining the cardinal principles, they have thoroughly remodeled the motor. As is well known to those who examined the Chicago motor at the shows, the principle embodied in the engine is the elimination of the ordinary tappet valves and the substitution of sliding parts by means of two sliding sleeves working between the waterjacket and the cylinder proper and operated by an eccentric motion, opening ports in the cylinder walls as the surfaces pass over each other. The head of the motor is detachable and efficiently water-cooled, and the spark plug is placed exactly in the center of each head. Each cylinder of the motor has an explosion every two revolutions instead of one at every revolution; otherwise it is credited with having all the good points of the two-stroke engine without any of its drawbacks.

With the Silent Knight engine gas is drawn in on the induction stroke, the inlet port being closed by the sliding sleeve and it is asserted the inlet and exit of the gases through the ports are easier and more direct than through the ordinary valve opening.

The remodeling of the Silent Knight motor by the English engineers, aided by Mr. Knight in person, brought about the elimination of a third port, which had been used as an auxiliary exhaust outlet at the bottom of the stroke, but which had been deemed unnecessary by Designer Knight long before he went to England. This was the principal change made by the English, who now claim that the engine is really silent in action, for, with the exception of the exhaust, there is nothing to make noise, the movements being of a gradual and sliding order, and there being no tapping movements or spring return operations.

HORSE-POWER RATINGS OF AUTOMOBILE MOTORS

By THOS. J. FAY, President Society of Automobile Engineers.

TO derive the horsepower ability of a motor in the absence of an actual test, is but to make an attempt to anticipate what the actual test would naturally disclose. It follows, therefore, that the actual test is the one best way: all others are simply approximations, and nothing more. Some engineers employ very simple and abbreviated empirical formulæ, in order that the attempt at the approximation will be the least possible trouble. In one case that came to the notice of the author, the error was 50 per cent the wrong way, i. e., the motor was capable of delivering 50 per cent more power than the makers thought it would.

The necessity of parading an overgrown horse power rating is not apparent, since if the motor is big enough to do the work, the smaller it happens to be, in any given case, the better for the owner of the car it is used to run.

The most abbreviated formula yet offered, is that used by the *A. L. A. M.*, as follows:

$$H.P. = \frac{d^2 N}{2.5}$$

in which

$H.P.$ = the alleged horsepower of the motor;
d^2 = the square of the bore of the cylinder in inches;
N = the number of the cylinders;
2.5 = a constant said to serve the purpose, in view of the actual ability of motors, and in further view of the similarity of the several makes of motors.

This formula says that a motor, of any stroke now used in automobile motors, will cover the requirements on the ground that the several motors are so near in point of stroke, as not to make a material difference in the actual power delivered by them.

Taking a given sized motor, as a four-cylinder, 4 x 4 in., bore and stroke of cylinders and pistons respectively, the rating would be:

$$H.P. = \frac{4^2 \times 4}{2.5} = 25.6$$

It is assumed that the speed will be the maximum possible; the highest attainable under which the product of the torque and the speed will afford the maximum possible. To obtain any kind of accuracy, quite a number of assumptions would be necessary, to say the least. But if all the motors are very much alike, and all are compared by the one formula, results a little high, or a little low, as the case may be, a correction can be introduced at any time, and will serve equally for all. No sooner is a rule promulgated than there is a desire to get around it. This rule, for instance, is the root of the innovation known as the "short stroke" motor. When the rule was promulgated, the majority of motors had strokes not far from 5½ inches, with a few longer, and some with a shorter stroke.

Importance of the Stroke as a Factor.

That the stroke does enter into the problem, can scarcely be denied, and that the stroke is now shorter than it would have been, in the absence of the rule, is a matter that can be taken for granted. Yet, it is possible the short stroke is a very good thing, from more than one point of view. The motor is lighter, the cylinder castings more regular and the difference in power is not so great as to defeat the main objects. As before stated, if a motor is of the proper size to do its work, it is the right size to use, on the ground of economy. If a motor is so large that it cannot be run at its economical load, its higher full load efficiency is valueless, since in service the necessary full load will not be available. A smaller and probably less efficient motor might serve with better results, for the very simple reason that it may be run at its most economical load.

An empirical formula, taking the stroke into account, might read as follows:

$$H.P. = \frac{d^2 (l\,k)\, N\, S}{10^5} \times f = \text{approximate horsepower,}$$

in which:

d^2 = the square of the bore in millimeters;
l = the length of the stroke in millimeters;
k = a constant, depending upon the length of the stroke;
N = the number of the cylinders (four-cycle motor);
S = angular velocity in revolutions per minute;
f = a factor of compression;
10^5 = a figure of convenience;

If the bore is not over six inches (152.4 mm), the values of k might be taken thus:

k = unity for six-inch stroke;
k = .90 for a five-inch stroke;
k = .80 for a four-inch stroke;
k = .70 for a three-inch stroke;

The exact values of k would certainly be subject to several conditions and to a series of variables besides. In a matter of this sort, however, many of the conditions tending to shift the k values would cancel themselves in service. These values are also dependent upon one other consideration that cannot well be eliminated, i. e., the speed of a four-inch stroke motor will be higher (considering the highest value of speed and torque) than the speed of the six-inch motor, and it follows that the actual reduction of power due to shortening the stroke is in a measure compensated for by the increase in speed, but the compensating factor will not suffice to wholly counteract the influence of the shorter stroke.

This counter influence, however, does so materially aid the process, as to warrant one in taking the k values as given, rather with the hope that, in the better class of motors, the k values might be increased somewhat. It must not be assumed, though, that the mere fact that a short stroke motor would run at a very high speed, is a warrant for so doing; there is a limit in practice to the speed *per se;* and that is the limit to take into account in deriving any empirical formula, on the ground that such a formula is but a practical device, at best. It would be out of the question to attach a theoretical speed to a practical formula and call the whole practical.

Effect of Stroke on Compression.

The values of f will change with the compression, and with the fuel, considering a given compression. If gasoline is taken as the fuel, and the compression ranges between 75 and 95 pounds per square inch absolute, the f values for the conventional types of four-cycle automobile motors might range about as follows:*

f = 5 at 75 pounds per square inch (absolute) compression;
f = 5.5 at 85 pounds per square inch (absolute) compression;
f = 6 at 90 pounds per square inch (absolute) compression.

In these deductions will be found ample room for controversy, for reasons that, in a theoretical sense at any rate, are perfectly good. On the other hand, it is a fact that motors, as they actually obtain, will not do better than the values of f as here given. But the author attaches more importance to the effect on the speed of the motor, as a result of higher compression, than he does to the direct influence of that compression. In other words, if the compression is low, a relatively slow speed motor will result due to ignition troubles, more than to anything else, at the higher speeds. But if the compression is high, approaching the point of pre-ignition, the ills that such a condition will engender must be borne. Increasing speed, unfortunately, increases the richness of the fuel and increases the hydrogen present. If it is true that different mixtures of a given fuel will perform differently, it is well within the bounds of good practice to say, equal mixtures of different gases will not afford equal results. It is plain then that a high compression can result in increased power, and would influence the f values, more than the

* The values of f given are on a basis of the actual compression, at the speed of the motor, at which the power is delivered. Cold compression is quite another matter.

amount given, were it not for the fact that the conditions to be maintained are beyond the bounds of common practice.

In a racing car, for illustration, it is possible to utilize the higher compression because the driver is skilled and the carburetion is looked after in the most careful manner. The more complete formula, taking the same problem as before, would afford results as follows:

$$H.P. = \frac{100^2 \times (100 \times .80) \times 1500 \times 4 \times 5}{10^9} = 24$$

which is a very high value. Built as some motors are, the factor of compression might well be 4 instead of 5. Certainly, the average motor of this size uses enough fuel to enable it to deliver the power stated, and if the thermal values, usually taken for motors, have any underlying reason for their existence, it is within the range of probability that the values given are approximately right. It is the factor of compression that must be adjusted, as between the respective motors and the author cannot accomplish such a task, merely in the act of devising a formula. This statement strikingly illustrates the earlier one, i. e., "the actual test would naturally disclose the actual horse power of a motor."

Conditions Affecting the Torque.

The horsepower of a motor increases in direct proportion to the speed, if the torque holds constant. It is unfortunate that the torque does not remain constant, nor does it increase with the speed. Indeed, it falls off with alarming rapidity under certain conditions as:

(*a*) If the compression is low and the mixture leaks by the valves or the piston.
(*b*) If the valves are too small.
(*c*) If the valves are not properly timed.
(*d*) If the cooling system is defective, a common complaint.
(*e*) If the spark is not properly timed, assuming it is otherwise adequate.

If it is true the torque will not hold constant, with increasing speed, this fact must be taken into account in any formula, but since it is the lowering compression that effects the torque, it is the factor of compression that must be adjusted in an empirical formula.

The torque of a motor, which for convenience may be called the "mean effective pull in pounds," at unit radius (one foot), may be known as follows:

$$H.P. = \frac{2\pi\left(\frac{H.P. \times 33{,}000}{2\pi SP}\right)\left(\frac{H.P. \times 33{,}000}{2\pi RP}\right)\left(\frac{H.P. \times 33{,}000}{2\pi RP}\right)}{33{,}000}$$

hence:

$$P = \frac{H.P. \times 33{,}000}{2\pi\left(\frac{H.P. \times 33{,}000}{2\pi SP}\right)\left(\frac{H.P. \times 33{,}000}{2\pi RP}\right)}$$

Simplifying the formulæ will result in the following:

$$P = \frac{H.P. \times 33{,}000}{2\pi RS} = \text{pull in pounds, at radius taken;}$$

$$R = \frac{H.P. \times 33{,}000}{2\pi PS} = \text{radius;}$$

$$H.P. = \frac{2\pi RSP}{33{,}000} = \text{approximate horsepower;}$$

$$S = \frac{H.P. \times 33{,}000}{2\pi RP} = \text{angular velocity in revolutions per minute.}$$

The Working Requirements Are Numerous.

There would be no need to set down the above formulæ, either in the involved or in the simplified form, except to show the source of the simplified form and to point out that in mathematics the abstract is ever available, to no practical purpose, since to know the value of the horse power or the torque, one must first determine their values by an actual test. Having made tests on the various types of motors, however, one may then assume values to the extent necessary to obtain the remaining values. If we assume the radius as unity, it does not become necessary to solve for the same; likewise, if we know the maximum speed permissible in practice, this may be assumed, if it is known that the motor will perform at such a speed.

For a motor to merely turn over at a given speed is not enough; it must deliver power in a manner to satisfy the formula, else the speed assumed will introduce a fallacy. The only way to be certain that the speed will be that of the maximum power, is to test the type of motor under actual service conditions sufficiently to establish the facts. The relation of speed to torque, in actual practice, is such that the maximum power does not, as a rule, obtain coincident with the maximum speed or with maximum torque. As the formulæ show, the power is in direct proportion to speed and to torque; as the speed increases, the power increases, if the torque remains constant, which is not true in practice, as the following records of tests will adequately illustrate:

SPEED AND TORQUE TEST.

150 mm stroke and bore Fiat motor, four-cylinder, four-cycle.

Speed in r.p.m.	Pull in lbs. at 1 ft. rad.	Speed × Torque.
1,090	341	= 1,090 × 341 = 371,690
1,412	315	= 1,412 × 315 = 444,780
1,800	262	= 1,800 × 262 = 471,600
1,920	210	= 1,920 × 210 = 403,202

As will be observed, the maximum value, due to multiplying speed and torque, fell at the point next to the lowest established by the test, and with the speed next to the highest observed during the test. A number of trial tests were made, to show that no better results would follow at other higher or lower speeds. Increasing the speed beyond the highest speed given above resulted in an alarming reduction of the torque, while at lower speeds than the lowest recorded here, there did not result such an increase as to compensate in any measure for the reduction in speed. The general behavior of the motor was such as to lead one to the conclusion that no further display of skill would enhance the results in any way.

Where the Empirical Formula Fails.

No empirical formula would predict any such results, because in this case the maximum power was produced at a piston travel of 1,800 feet per minute, which is 800 feet per minute higher than the empirical formula contemplates. The formula of the A. L. A. M. would fix the horsepower-rating of this motor as 57.6. To show how much motors can vary, another torque test was as follows:

SPEED AND TORQUE TEST.

165 mm bore × 170 mm stroke, four-cylinder, four-cycle motor.

Speed in r.p.m.	Pull in lbs. at 1 ft. rad.	Speed × Torque.
800	446	= 356,800
900	390	= 351,000
1,000	350	= 350,000

Below 800 r.p.m. there was no increase in torque to compensate for a reduction in speed, hence it was fair to take 800 r.p.m. as the speed of maximum power. This was a case in which the maximum power was developed, below the piston travel (1000 ft. per minute) assumed in the case of the A. L. A. M. formula. Both of these motors were designed to do just what the tests showed; one as a motor for racing cars, in which the power of the higher speed could be utilized for a short time, and the other for a racing motor-boat, in which the propeller could not (at that time) be designed for a higher speed. Both were used in automobile work, but only one could claim a place in boat work, that is, on a basis of the delivery of the maximum power. In marine service, the last-named motor would deliver the maximum available power at a lower speed, because it was designed to do so. How, then, can any simple formula serve for all motors, in view of such marked differences? Indeed, the differences noted do not cover the range, because both motors cited were of the finest of the time, and indifferently designed motors would not do nearly as well as either one of them.

(To be Continued)

GETTING ACQUAINTED WITH A CARBURETER

By HERBERT L. TOWLE.

MANY pages have been printed on the subject of scientific carbureter adjustment. Nevertheless, the man who has installed a carbureter of unfamiliar make is apt to find all his carefully studied principles oozing away as he heatedly grinds away and the motor fails to start. It was easy enough to preserve a scientific frame of mind so long as he had some other fellow's trouble to deal with, but it is quite another matter when repeated breathless spinnings of the crank have brought no result, and in sheer demoralization one is tempted to suspect spark plugs known to be clean, batteries known to be fresh, and spark coils which were in perfect working order up to the instant the old carbureter was taken off the car.

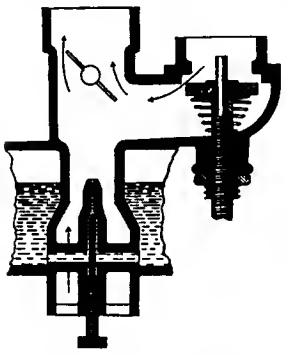


Fig. 1. — Typical Automatic Carbureter. Primary air opening is fixed. A needle valve controls the spray orifice. Spring tension and lift of auxiliary air valve are separately adjustable.

The human mind is incapable of retaining more than a limited number of ideas at once, and the stress of one dominant sensation or experience may for the moment drive out of mind other ideas which in calmer moments would be accorded their due weight. It follows that when you are telling your neighbor how to adjust his carbureter you can split hairs all you like, but when you are adjusting your own your formulas cannot be too simple. Even after the engine has been started your troubles are by no means over. You adjust the carbureter so the engine runs well on the floor, and find that when you take the road the car will not get out of its own way. You adjust to give respectable speed, and find that you cannot start. Then you begin all over again, and possibly find that when the car runs fast on the level it pulls badly on hills, or that when it takes grades nicely the motor overheats at high speed, and drinks more gasoline per mile than you had believed was possible. Or perhaps you are totally unable to get an explosion. Worn out with your exertions, you shut the tank valve and sit down to smoke a cigar. Then you try again, following apparently the same routine, and the motor starts off as if nothing was the matter.

The nonautomatic type may be ignored, and the automatic carbureter may be broadly classified into the auxiliary air valve and the "puddle" types. Owing to certain characteristic differences in behavior it will be best to treat these types separately. Inability to start the engine, to speed up, or to run as slowly as one would like may all be due to either too little or too much gasoline. To determine which is the cause one must be guided by other and sometimes very subtle symptoms. Of the grosser symptoms of poor mixture it may be said that overheating, if not due to slipping of the fan belt or clogging of the water passages, is caused generally by too much, rarely by too little, gasoline. Black smoke indicates a very considerable excess and popping in the carbureter indicates too little.

As the first essential is to get the engine started, we will consider that first. With any spray carbureter, the mixture for starting must be obtained by priming. It is, however, possible in this manner to make too lean or too rich a mixture; and if the adjustments are decidedly wrong the mixture formed on the first few revolutions will be so bad that the motor will stop. Sometimes the float is too high or too low, and the gasoline overflows continually, or is so low that great suction is required.

It is best to observe whether gasoline drips after the float chamber has had time to fill. If no dripping occurs, depress the float, and on the first sign of dripping crank the engine immediately. If it does not start, prime the carbureter again. If this fails, shut off the gasoline at the tank, and if there is a drainage outlet from the float chamber draw off a couple of teaspoonsful of gasoline. This weakens the mixture. Repeated cautious experimenting in this manner will soon establish the priming required to start the engine when cold. When it is warm the gasoline evaporates more rapidly, and caution is required not to prime too much. Many carbureters with a small primary air passage will start the engine without priming.

If the engine starts, but immediately dies down, try holding the float down. If the cause of dying down is too weak a mixture, this will keep the engine going. See that the gasoline level is not more than 1-10 inch below the spray nozzle. If the engine still stops, the mixture is too rich.

If the carbureter drips when standing, the float valve should be investigated. If pressing it shut stops the dripping, the float is too high. If the dripping persists, the valve leaks and must be ground to a fit, preferably using pumice stone, since emery is liable to embed itself in the brass. Occasionally a float and float valve are so arranged that the valve, although tight in one position, may slant over a trifle and leak from that cause. Such carbureters are a nuisance, since the gasoline level constantly varies. The automatic air valve is not supposed to open when the engine is run slowly with the clutch released; consequently we have first to deal only with the adjustment of the spray orifice or of the primary air opening. Some carbureters have a fixed primary air opening, and control the spray orifice by a needle valve, while others have a fixed spray orifice and control the primary air intake. Reducing the primary intake produces a greater suction, and is equivalent to opening the spray orifice. Adjusting to keep the engine running on a low throttle is therefore a simple matter. Let us assume the engine to run smoothly on a low throttle. The spark is now fully retarded, and with the clutch still disengaged the throttle is slightly opened. The engine should accelerate smartly, and should attain at least its maximum road speed on about one-eighth of the full throttle opening. The auxiliary air valve should open, but not to its full extent, as the engine is not taking full charges. If it opens fully, the spring is too weak, and its tension should be increased.

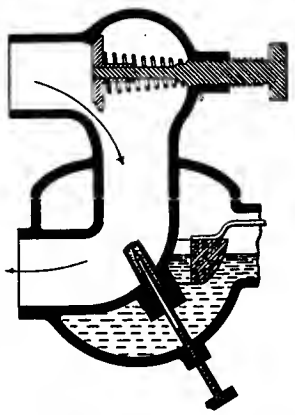


Fig. 2.—A simple form of Carbureter. All the air enters at one point and passes around the spray nozzle, but the inlet opening is enlarged by the automatic air valve as the suction increases, thus preventing the suction from becoming excessive. The spring tension, but not the lift, of the auxiliary air valve is adjustable.

The second step is to try the car at moderate speeds on the road, and here the real process of adjusting begins. Let us suppose—what is likely to be the case—that the engine is sluggish. Without stopping the engine, try slight changes in the spray orifice or primary air inlet. First reduce, then increase the richness, and note the effect on the car's performance on level ground. An adjustment will presently be found with which the car runs well at ordinary speed. Now turn your attention to the auxiliary air valve, and bear in mind that you do not yet know that the mixture at ordinary speeds is correct; you may be driving with the throttle wider open than it should be. Note whether the radiator seems to heat up on the

level ground, also if there is a tendency to weakness and overheating on hills. These symptoms indicate tbat the mixture is too rich. Notice whether the auxiliary air valve opens sufficiently (*i.e.*, from one-eighth to one-fourth inch, depending on the size). Adjust the stop to increase the lift slightly, and slacken the spring. Remember, however, that a change in the spring tension has a greater proportional effect at low than at high speeds. This is very important. If easing the spring helps matters at medium but not at high speeds, note whether the auxiliary valve strikes the stop before the engine reaches its maximum. If so, the high speed mixture is too rich. If the construction is such that the valve can open further, adjust the stop accordingly. If, however, it flutters and behaves irregularly, the lift must be restricted. Increase the spring tension again and reduce the spray orifice. If thcre is no needle valve controlling the spray, reduce the primary opening so that a larger proportion of the total air stream will go through the auxiliary valve. These changes will weaken the mixture more at high than at low speeds, which is desired.

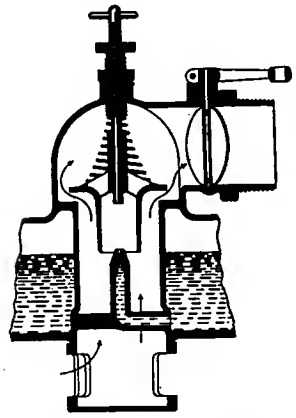


Fig. 3.—In this type of carbureter all the air enters by one inlet, but part of it is shunted around the spray and does not take up gasoline. The nozzle has no needle valve, but the size of the air inlet is adjusted by a fixed shutter.

Suppose, on the other hand, that instead of overheating the motor was simply weak. It is a good guess that the mixture is too lean. Possibly the auxiliary valve spring is so weak that the valve opens fully at low speeds; or perhaps the lift is too great for the size of the engine. It is not usually difficult to modify the low-speed adjustment so that the car gives its maximum power and speed, and this should be the third step. There is less room for uncertainty here than about the low-speed adjustment, since unless the mixture is actually about right the maximum speed of the car will not be reached A good test of the mixture is the response to the spark advance. If the mixture is bad the spark must be advanced considerably to produce any noticeable acceleration, whereas with the correct mixture any change in the advance is at once felt, and the maximum advance is not needed except at maximum speeds. Even more marked is the response to the throttle when the latter is nearly closed, and this is therefore the best low-speed test.

When the high speed adjustment has been found, the fourth step is to see whether the car will do equally well at ordinary speeds. If it does not, one can generally tell whether the mixture is too rich or too lean by recalling what was done to make it correct at high speeds. For example, suppose the improvement at high speeds to have been obtained by increasing the auxiliary spring tension. This enriched the mixture at high speed, but enriched it more than proportionately at lower speeds as well. It is possible that the auxiliary spring is wound from too light wire or has too many turns, so that it is under too much initial tension, and therefore does not yield to the suction as soon as it should. Before changing the spring, however, try slackening it to its earlier adjustment, allowing the valve to open under moderate suction, and open the spray orifice slightly or reduce the primary air inlet. This will still give the desired mixture at high speeds, but will give a leaner mixture at low speeds. Suppose thc mixture was found to be originally too rich at high speeds, and was corrected by slackening the spring or increasing the auxiliary valve lift. If the change was only in the lift the mixture at lower speeds has probably not been affected. If, however, the spring has been slackened, the mixture may be too lean at low speeds, owing to the air valve opening too soon. One way to correct it would be to use a spring having a larger number of coils, but a satisfactory result may usually be reached by increasing the spring tension and reducing the spray orifice.

Where the carbureter is of the puddle type the physical manifestations of rich or lean mixture will be quite the same. It has certain individual peculiarities, acquaintance with which will smooth the owner's way considerably. This type of carbureter differs from tbe spray type in having a U-shaped mixing chamber, in the base of which a puddle of gasoline about 3-32 inch deep is maintained by an annular float. As this puddle is supplied by gravity, a weaker suction will produce a mixture than where the gasoline must be both lifted and atomized by suction. As the puddle is constantly supplied, it will evaporate continuously as long as the tank valve is open, and when the motor is not running it may produce a mixture too rich to ignite, particularly if the engine be hot. If the float valve be so high that flooding occurs, this effect will result very quickly. If, therefore, a carbureter of this type does not start the engine immediately on priming, the chances are that the mixture is too rich. The tank valve should be shut and a little gasoline drained from the float chamber, when the motor will start easily.

This type of carbureter is very sensitive to changes, both in the float level and in the needle valve adjustment. A single turn of the screw adjustment of the float valve is equivalent to wiping out the puddle or doubling its depth. The easiest way to ascertain the correct adjustment is to connect up the carbureter with thc intake in such a position that one can see the puddle, either directly or by a small mirror and electric flashlight. When approximately the right level has been obtained, further adjustment will be a matter of marking the float valve stem and turning its threaded adjustment not more than one-eighth turn at a time until the correct position has been found. If the float is too high the engine will be hard to start, and will accelerate badly, overheat and show poor power on hills. Once worked up to speed it may show excellent power. Partly closing the needle valve will improve the power at medium speeds, but will reduce it somewhat at high speeds. If the float valve is too low, thc engine will start easily by priming hut will develop poor power at ordinary speeds. If the needle valve is opened this may be partly corrected, but at the cost of excessive gasoline consumption at high speeds. Generally speaking, if the gasoline level is materially too low, the power developed will be poor at almost any speed, and it will probably be hard to run slow in high gear. When the correct float adjustment has been found, thc needle valve must be very carefully adjusted. A sixteenth of a turn will make a vast difference in the power. Once properly adjusted, the engine will be very flexible to close the tank valve whenever thc engine is stopped.

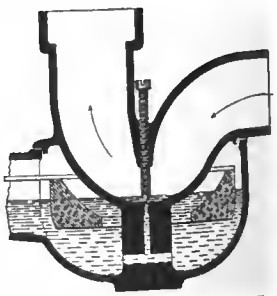


Fig. 4.—A "Puddle Type" Carbureter. A gasoline puddle in the base of the V-shaped mixing chamber is fed by gravity and is swept along by the stream. No lifting action is required of the gasoline, and a mixture is produced by very slight suction.

It is an excellent rule for thc amateur not to try to rush an adjustment. His first impression of the nature of his trouble may on further trial be found quite wrong. When he gets a fairly good mixture it is best to drive thc car a day or two, carefully noting its behavior, giving opportunity for the finer symptoms to show themselves, and giving himself time to analyze them critically before he attempts changes. If changes must be made on the road—other than in time expressly selected for that purpose—it is well to limit them to simple changes in needle valve adjustment.

LETTERS INTERESTING AND INSTRUCTIVE

MORE ABOUT THE GRADE QUESTION.

Editor THE AUTOMOBILE:

[1,549.]—Kindly pardon me for taking lseue with you on the grade questlon. I contend that the baee llne of meaeurement muet be the incline up which you are going, not the horizontal; 100 per cent. is etralght up and down; 100 per cent. muet be all there is of anything.

You want the grade of a certain hill. You provide youreelf with a 10-foot pole and a spirit level, go on the hill, and eelect an average grade. Lay down your pole and mark each end; bring tbe lower end up horizontal by the aid of the spirit level; measure up to tbe pole from the lower mark, perpendicular to the pole. This distance will give you a baels from which to figure the grade.

Take your diagram and measure up 110 feet. Have you got a 110 per cent. grade? Did you ever eat 110 per cent. of a pie? Please think tbis over and let me hear from you again.

Vergennes, Vt. A. D. EVARTS.

Your method is a perfectly good one, but it is not the one in general use. The difference is that you reckon by the sine of the angle instead of the tangent. Used with the ten-foot pole and spirit level, the method we gave is even simpler in

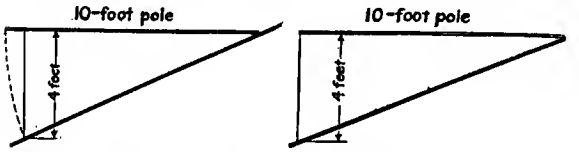


Diagram Illustrating Two Methods of Reckoning Grades.

application than yours. Rest one end of the pole on the ground and get it horizontal by means of the spirit level; then measure to the earth perpendicular to the pole, and the distance in feet, multiplied by ten, will be the percentage of the grade. By this method, of course, straight up and down is a grade of infinity per cent., which certainly is much closer to being "all there is of anything" than a mere paltry 100 per cent.

As to the percentage question, did you ever make 110 per cent. profit on anything you sold? We know some people who do. And though we may never have eaten 110 per cent. of a pie, we have eaten some that felt like it afterwards.

CONCERNING VALVE PORT ARRANGEMENT.

Editor THE AUTOMOBILE:

[1,550.]—In an engine with valves on opposite eides two porte are arranged for, but I underetand with valvee in the head only one port is used. Ie this correct? If so, bow is the port arranged for the inlet and exhauet gases? SUBSCRIBER.

Milwaukee, Wle.

All engines have two valve ports, one for the inlet and one for the exhaust, whether the valves are on opposite sides, the same side, or in the head. You are probably thinking of the Franklin valve system, in which the two valves are concentric and appear like one; but there are two ports there just the same.

IS A SMOKY EXHAUST EVER NECESSARY?

Editor THE AUTOMOBILE:

[1,551.]—I have noted recent Inquiriee on the eubject of lubrication, and while I do not intend to go further along the eame line, the question has euggeeted iteelf to me, whether it is ever necessary to run a car with a smoky exhaust from this cause, in view of the great amount of attention the emoke nuisance is now receiving.

Philadelphia, Pa. B. HARKER.

The only time it is necessary to use an excess of lubricating oil is when the engine is new, or when it is being put to an excessive strain, such as occurs in racing. Smoky exhausts are coming to be regarded more and more as an indication of carelessness and poor driving. We print elsewhere in this issue some advice from a prominent manufacturer of lubricating oil which should be interesting in this connection.

TO FIND QUANTITY OF GASOLINE IN TANK.

Editor THE AUTOMOBILE:

[1,552.]—I wae pleased to see in the September 17 ieeue of The Automobile an arangement for telling how mucb gaeoline there is in a tank, and thought I would send in my method for the benefit of your readers. I purchased for five cents in a drug etore a glaes pipe about 1-4 inch diameter with a 1-8-inch hole, and about 2 inches longer than the depth of the tank. By putting thie down into the tank and placing my finger over the top, then witbdrawing the tube, all the gasoline that entered the hole is held tbere by atmoepheric pressure, showing immediately the depth of the liquid in the tank. When the finger le removed, tbe gasoline runs out. I put two emall leather loops on the underside of my eeat over the tank, and push the glaee tube into them, where it le alwaye ready for use. H. B. P.

Hartford, Conn.

Your method is a very good one, infinitely to be preferred to the usual stick. A glass tube is frequently used in chemical experiments in this way to dip out a small quantity of a liquid, but we do not remember having seen it adapted to automobile use before.

CRITICISM OF TWO RECENT ANSWERS.

Editor THE AUTOMOBILE:

[1,553.]—I feel that I must take exception to two repliee which you made in last week's paper, first, which wae to J. M. Butler & Son, and, eecond, to party eigning "Brakes." Now, as I bave been a constant reader of your journal from its inception, I wisb it understood that I am anewering only in a friendly epirit, and feel it is my duty to do eo, ae botb answers are, ae given by you, incorrect, and I earnestly trust to see them corrected in your next lseue.

In regard to any modern two or four-cylinder touring car being able to travel eaeily at a speed ae low as 10 or even 5 miles per hour. I claim thie is imposeible on the high gear or direct speed, and is possible only with six-cylinder cars, uniees perfectly level or down grade le being traveled. I do except cars geared lower than the average custom and some light runabouts, but the average touring car when it gete down to 10 miles per hour with ordinary gear ratio of 3 to 1 on the direct drive, has its engine turning so elowly that if anything like a grade ie being ascended the car will positively not pick up without at least slipping the clutch, or is quite more likely to stall entirely, should occasion occur to quickly get out of the way of some team or paesing machine. You eay you do not understand where euch a question ever arose from. Please allow me to say that by making this remark you clearly ehow that you have never driven or rode with a driver to any great extent, otherwiee you surely would not have eo expreeeeu yourself.

Your answer to "Brakes," in which you eaid diseimilar metale are used in brakes because they possess a greater coefficient of friction, is aiso wrong, as a little reasoning on your part will clearly show from the fact that all plain bearings employ dieeimilar metale, euch as Babbitts, bronze, or some other alloy, in which rune a eteel shaft. If these metale poseeesed a very great coefficient of friction, they would not be used, a's you surely will admit in cbooeing materiale for bearinge friction is not eought for. A very plain experiment why dissimilar metals are used in bearings is thus: If we hold two comparatively coarse files together and try to move them back and forth, great effort is required; if one file le quite fine and the other coaree, the effort will be much lese. Now, should we view a finished shaft through microecope, same will be eeen to contain a very rough and irregular surface, the eofter materiai will aiso show a roughness, but of a much finer grain. The ehaft represents the coarse file and the soft metai the fine file. Now, the sole reason that metals of the eame kind are not used in brakee is because they would wear out too rapidly, just as they would if ueed for bearings, and a brake is nothing more than a large-sized bearing carrying a heavy load. Above illuetration appeare in George M. Hopkins' Experimental Science and other standard works above criticism.

Phoenixville, Pa. LEWIS T. RHODES.

If you will work out the exact number of revolutions per minute of the engine of a car geared 3 to 1, with 34-inch wheels, running ten miles an hour, you will find that the speed is probably higher than you thought.

$$\frac{5280 \times 10 \times 12}{1} \times \frac{1}{34} \times \frac{7}{22} \times \frac{3}{1} \times \frac{1}{60} = 296 \text{ r.p.m., approximately.}$$

Substituting 32-inch wheels for 34-inch wheels, the result is approximately 315 r.p.m. If you own a car with an engine in it which cannot run as low as 300 r.p.m. under load, we would advise you to get a new one. The minimum speed under load is usually taken at 150 r.p.m., and this was what we figured on in saying a car should run as low as five miles an hour on the high gear. As to our personal experience, we are willing to undergo any reasonable test, but we hardly think that enters into the question.

We admit that all plain bearings at present in use employ dissimilar metals, but the conclusions you draw therefrom are erroneous. Babbits and bronzes are used because their natural coefficient of friction is so low that their combination with a steel shaft gives less friction than a bearing in which both members are steel. A babbitt shaft in a babbitt bushing would give still less friction, but, unfortunately, shafts cannot be commercially made of this material. Your illustration of the coarse and fine files holds only in case the bearing is not lubricated, as with proper lubrication the oil forms a film between the two metals, and their surfaces do not actually come in contact.

We protest at your definition of a brake as a large bearing carrying a heavy load. How about the shaft bearing of an ocean-going steamship, two or three feet in diameter and carrying five or ten thousand horsepower? On the other hand, the coaster brake of a bicycle is only a few inches in diameter.

DIMENSIONS OF STRANG'S ISOTTA RACER.

Editor THE AUTOMOBILE:

[1,554.]—I would like to draw your attention to some inaccuracies which I do not think can be blamed on the typographer. The last issue of your usually excellent magazine had a statement which conflicted with a previous one so markedly that I had to compare the two. I will quote them and allow you to judge for yourselves.

On page 595 in the issue of April 30, describing the machines which took part in the Briarcliff, the first words are: "According to A.L.A.M. rating, Strang's Isotta was the highest powered machine on the course, its cylinder diameter of 145 mm. being equivalent to 5.7087 inches, which gives 55.1 horsepower." Further down, in the same column, concerning wheelbase: "Strang drove a 118-inch machine." In the table on page 597 the Isotta is credited with a bore of 5.7087 inches and stroke of 4.7245 inches. Now, in the issue of September 10, page 359, your technical editor states: "Strang's Isotta three-time winner has a four-cylinder engine, the dimensions of which are the metric equivalent of 5 7-8-inch bore by 5 1-2-inch stroke, rated at 60 horsepower." Further along: "The wheelbase is 122 inches."

Lastly, I would like to ask you which type of car Guyot drove in the French voiturette race—a single or a double cylinder. I know one of the Delages was a single cylinder and the rest double. On page 38, July 9, you say a double cylinder, and on page 84, July 16, you head an article "Single-cylinder 50-miles-an-hour Voiturette Winner." CHESTER S. RICKER.

Ithaca, N. Y.

We are unable to give you any authoritative figures as to the dimensions of Strang's Isotta, as the manager of the Isotta Import Company declines to make any statement on the subject. The official declaration of the bore at the time of the Briarcliff was 145 mm., equivalent to 5.7087 inches, as in the paragraph you quote, and this is doubtless correct. The figures for the stroke and the wheelbase were probably estimates.

Guyot's Delage was the single-cylinder one of the team. The error in the first article probably was made in the confusion attendant upon getting off the first cable reports after the race, and was corrected by the mail account in the next issue.

CONCERNING THE "3-PORT" 2-CYCLE MOTOR.

Editor THE AUTOMOBILE:

[1,555.]—Up to recently I have been under the impression that the two-cycle motor was a single type, but have frequently come across the term "three-port," and also note that some concerns advertise that their engines are absolutely "valveless," while others do not. Can you enlighten me on this point? INQUIRER.

Plymouth, O.

The two-cycle motor as largely employed in small marine work at first, was of what is known as the "two-port" type, in that a port is employed for the admission of the fresh charge, and another for the escape of the exhaust, while a check valve was used to imprison the mixture in the crankcase at the end of the suction stroke. In the "three-port" type, a port is used for the latter purpose as well, thus eliminating the check valve, making the engine valveless. It was found that the check valve constituted one of the greatest evils of what was known as the two-port engine, through the frequent uncertainty of its working, and when it was successfully eliminated by the use of a third port, the makers naturally sought to call attention to this advantage by terming the engine "valveless." There are some three-port engines which do not answer this requirement, though they embody nothing in the shape of a valve as present on the four-cycle type. In strict terms, however, a port covered or uncovered by the piston is as truly a valve as the usual poppet type.

ONE WHO CAN DRIVE AT FIVE MILES AN HOUR.

Editor THE AUTOMOBILE:

[1,556.]—"The Lowest Speed of an Automobile," is noted in your issue of September 10. I have a Franklin runabout, and on bad roads, such as the Plank Road between Jersey City and Newark, I run at a rate of less than five miles an hour. A short time ago when in Connecticut I went astray, and in taking a short cut to get back to the right road, I went over a road so rough and hilly and sandy that if the road to Hades is anything like it there will be no travelers that way. I drove sometimes on first and sometimes on second speed, and, when I could, on high. On high gear I did not go over five miles an hour, usually four, or even less. At the end of a 55-mile trip the engine was running easily and sweetly, with nothing overheated.

Be good to the engine and you will be good to the whole car, tires included. Overload the car and overwork the engine, and you won't have to get out of the car to look for trouble; it will come to you. Some people know well enough that two locomotives are often required to pull a train, and yet seem to think there is no such thing as overload to the engine of an automobile. I am told I am lucky, but I am just good to the beast, and the beast is good to me, that's all. GEORGE E. LONG.

Jersey City, N. J.

TRUE STORY OF THE DARRACQ LITIGATION.

Editor THE AUTOMOBILE:

[1,557.]—A few weeks ago there appeared in your publication an article relating to the court proceedings brought by some stockholders against A. Darracq & Company, Suresnes, France, asking for the dissolution of that company. Upon making inquiries of the company regarding this matter I was officially informed by the chairman of the board of directors as follows:

"The articles you refer to relate to some proceedings taken by a few stockholders in France at the instigation of the Marquis De Dion to have it declared that A. Darracq et Compagnie is irregularly constituted under French law. The judgment of the French Court was given on August 5, when the proceedings were dismissed and the claimants condemned to pay the expenses in addition to 5,000 francs damages, for bringing an action without reasonable motives, the Marquis De Dion being personally condemned in 1,000 francs damages. The Court intimated that a higher damage would have been given, but it thought the injury to the company had been more moral than actual. If you could get this result inserted in any of the papers which have noticed the matter I should be much obliged."

I should be very glad to have you give this the necessary publicity in the next issue of your magazine.

G. M. MACWILLIAM,
New York City. Darracq Automobile Parts.

A HELPING HAND FROM MONTANA.

Editor THE AUTOMOBILE:

[1,558.]—Noting letters 1509 and 1515 in the issue of August 20, I think I can help the inquirers. With regard to the first, would call the attention of the two writers to a book advertised in your columns that is certainly all that one could ask for if he is looking for good, practical information with regard to the automobile, namely, "Self Propelled Vehicles," by J. E. Homans, at $2.00. Possibly this book would cover the ground that is required. This is certainly the best treatise I have seen and I have quite a number.

As to letter 1515, possibly one of the following firms may be able to fill the bill for Mr. Carruthers: E. F. Hodgson, P. O. Box 112, Dover, Mass.; Springfield Portable Construction Co., 57 Waltham avenue, Springfield, Mass.; North American Construction Co., Bay City, Mich. "GLAD TO HELP."

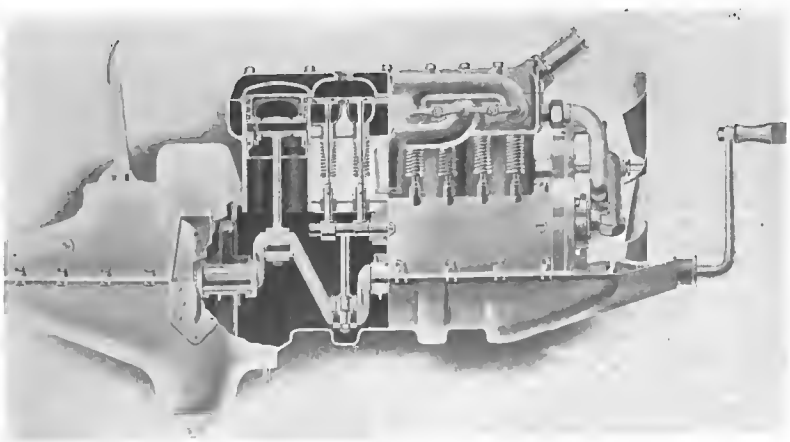
Butte, Montana.

WHEN the now familiar Ford runabout appeared three years ago, the Ford Motor Company announced that it would soon bring out a light touring car at a correspondingly low price. Work on this model has been going on steadily ever since. The car was ready last January, but it was decided to test it in actual service before putting it on the market. The cars built at that time have now been in use over nine months, giving opportunity for improvements and refinements as occasion was found for them. While the general appearance of the touring car recalls very strongly the runabout, it is nevertheless an entirely distinct design. The stroke of the engine has been lengthened to 4 inches and the layout considerably changed. There is also an entirely new system of rear spring suspension. The wheelbase is 100 inches, weight 1,200 pounds, and the price $850. Deliveries begin October 1.

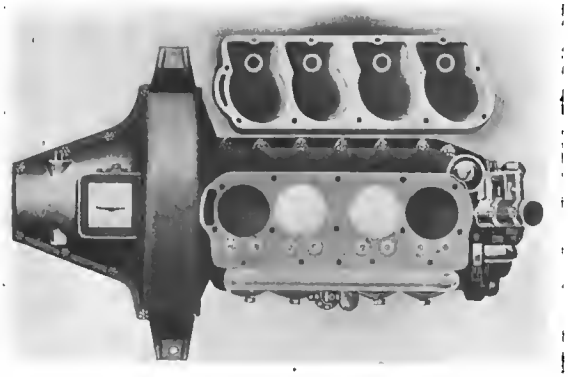
Motor.—The motor of Model T—as the light touring car is officially designated—is, of course, a four-cylinder, four-cycle, and is rated at 20 horsepower. Bore and stroke are 3¾ and 4 inches respectively. The cylinders are cast in one block, with the water jackets and the upper half of the crankcase integral; but the water-jacketed cylinder head is an entirely separate unit, easily removed when desired for cleaning, adjusting, etc., with the breaking of but one connection. The advantages of this design are obvious; anyone who has had to clean the carbon out of a cylinder or grind in a valve on a motor of the usual construction will recognize them immediately. By removing 12 bolts, all four cylinders and pistons and the eight valves are instantly accessible. The disadvantage appears to be that it introduces a ground joint in each cylinder head. It should be remembered, however, that the two smaller joints in each cylinder, for the valve covers, are eliminated. Further, this design lends itself admirably to the scheme of water circulation. There is one inlet, at the front of the cylinder casting, and one outlet, at the front of the head casting; but the only communication between the jackets of the cylinders and those of the heads is at the extreme rear, so that the water is forced to circulate through all parts of the jacket, and cannot by any possibility "short-circuit."

All valves are on the right-hand side and are actuated from one camshaft, which is cut from the solid with cams integral. The push rods have flat, mushroom ends to bear on the cams. The inlet and exhaust manifolds are separate and are held to the cylinder casting by four yokes and bolts.

The upper half of the crankcase, as mentioned above, is of cast iron integral with the cylinder block; the lower half is of pressed steel, extending back under the flywheel and change-gear, and forward to support the starting crank. It touches the frame at three points, and carries the entire power plant. The first point of suspension is at the bearing of the starting crank, the extension of the case resting on the middle of the front cross member of the frame; the other two points are one on each side of the flywheel, where pressed steel brackets, riveted to the case, extend out to the frame members on either side. It will be noticed that the lower half of the case is not, as usual, a mere oil pan, and cannot be removed without removing the whole power plant from the frame; instead, access to the connecting rods is provided through large hand-holes in the upper part of the case, on the left side. Flywheel and change-gear are completely enclosed by the pressed steel case underneath and a light cast cover above.



Complete Power Plant of the Ford Touring Car, in Partial Section.



Motor from Above, with Cylinder Head Casting Removed.

Motor Accessories.—The carbureter is a new design float-feed automatic, with a quintuple ball air valve. The valve is controlled by a small lever on the dash, so that it is possible to make all adjustments from the seat. The gasoline tank is cylindrical, of 10 gallons capacity, and is mounted directly on the frame under the front seat.

One of the most radical features of the new car is the ignition. This is by magneto exclusively, and the magneto is embodied in the flywheel as an integral part of the motor. It has no commutator or brushes, no gearing, no contact points, no moving contacts, no moving wires; the rotor is a part of the flywheel, and the stator, carrying the coils in which the current is generated, is a stationary spider carried on the inside of the flywheel casing. The slightest movement of the flywheel generates current enough to make a powerful spark. The timer is mounted on the front end of the camshaft, and the spark coils and switch are on the dash.

The water-cooling system consists of a vertical-tube radiator of the same familiar design as used on the runabout, an eight-bladed fan and a centrifugal pump. The fan and pump are mounted on the same shaft, the former, of course, in front, and are driven by a pinion meshing with the two-to-one gear; they are supported and centered by bolts projecting from the gear casing. The direction of the water circulation through the cylinder and head castings has already been described. Piping is almost completely eliminated, there being only three short connections—bottom of radiator to pump, pump to cylinder casting, head casting to top of radiator.

Lubrication is entirely by splash. The lower part of the pressed steel casing which encloses the crankcase, flywheel and change-gear is filled with oil. The flywheel, revolving in this oil, throws it against the sides and top of the casing into ducts which feed front and back to the motor bearings, the gears and the universal joint. Each connecting rod big end dips into a separate oil well and splashes oil to the pistons and cams. All overflow from these wells returns to the large well under the flywheel.

Transmission.—The change-gear is of the planetary type, which the Ford Company has always persistently advocated. It gives two speeds forward and a reverse. On the high speed the whole weight of the gear revolves with the flywheel; on the low speed and reverse the planetary gears and pinions come into action, but as none of these are of the internal type, there is very little noise or vibration. The clutches are low speed and reverse are fiber-lined steel bands; these grip their drums smoothly, and when released spring away, insuring positive action and no waste of power from dragging. A third band forms the foot brake. The high-speed clutch is of the multiple disc type, so designed as to give the maximum bearing surface, and running in an oil bath. The reserve power and flexibility of the motor call for very little use of the gears. The low speed is rarely used except for the first 20 or 30 feet, when starting from a standstill; on the high speed the car can climb any ordinary hill and run at from 3 to 40 miles an hour.

From the change-gear the power is transmitted through the single universal joint and the drive shaft to the bevel gears on the rear axle.

Running Gear.—The rear axle is the usual live type, and is combined with the torsion tube, which encloses the drive shaft, according to the Ford "three-point system." The front end of the torsion tube forms the ball of a ball and socket joint, the socket being firmly supported by the rear end of the pressed-steel undercasing of the power plant. This tube transmits the entire driving thrust from the axle to the frame, none of it being taken by the springs. Moreover, the tube is braced by two other lighter tubes, which extend from behind the ball and socket joint diagonally to the rear spring seats on the axle, so that it is not necessary to make the parts of abnormal size to insure rigidity. The universal joint of the drive shaft is, of course, centered inside the hollow ball of the joint. By this construction the rear axle has perfect freedom to adapt itself to the road surface, while the rear spring system may be made light and flexible and its resiliency fully utilized.

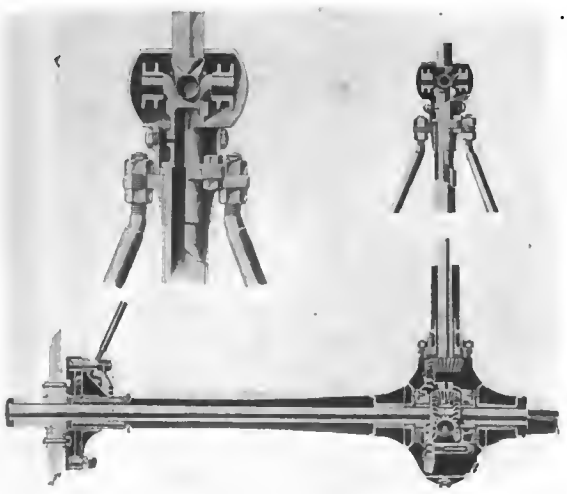
This construction is practically repeated in the front axle. Here there is no transmission of power to be cared for, but similar brace tubes run from the spring seats and meet in a ball joint carried by the steel undercasing at a point just forward of the flywheel. The axle itself is a one-piece forging of vanadium steel, and is straight from spring-seat to spring-seat.

The entire spring system consists of but two semi-elliptic springs, one in front and one in rear, both inverted and transverse. Their ends are shackled on the axles close to the wheel hubs, and at the middle they are held to the front and rear cross-members of the frame, respectively, by stout steel straps. The cross-members are of an inverted U-section, in which the springs fit snugly. The attachment of the front spring is well shown in the front quartering view of the car with landaulet body. One advantage of this arrangement is that the weight of the car is brought out close to the wheel hubs, thus relieving the axles of much strain.

The wheels are artillery, with 12 spokes, 30 inches in diameter. The rear wheels are keyed to the ends of the live axle shafts; the front ones run on ball bearings. Tires are 30 x 3-inch front and 30 x 3½-inch rear.

Control.—Perhaps the first thing that the average driver would notice on seeing the car is that the steering wheel and levers are on the left-hand side. This arrangement has been frequently tried and as often abandoned; its adoption on this car certainly shows the Ford Company's unwillingness to be bound by any tradition. Theoretically, of course, since vehicles meeting on the road pass to the right, the

The Ford with Landaulet Body, for Taximeter Service.



Ford Three-Point Drive System—Rear Axle and Joint.

driver should sit on the left, so that he may see the road beyond. This involves the disadvantage that he must operate the side levers with his left hand, which many people find extremely inconvenient. However, on the Ford these levers have the simplest possible forward and back movement, and are rarely used except for starting and stopping. One controls the high speed forward and the reverse, the other the emergency brakes, which are internally expanding on the rear hubs. Two pedals operate the slow speed forward and the service brake respectively.

The steering column is raked at a sharp angle and carries the irreversible gear at its top, in a small circular case just under the wheel. The throttle and spark levers are mounted on the column on the right and left, respectively, where they can be reached by the index fingers of each hand, without releasing one's hold on the wheel-rim.

Bodies.—The standard light touring body seats five persons comfortably. Its lines are simple and graceful. well accentuated by molding. The hood retains the runabout design, square with beveled corners, and harmonizes perfectly with the body. Practically the entire weight is carried between the axles, the rear seat overhanging very slightly and the hood not at all; this is permitted on the comparatively short wheelbase—100 inches—by the unusually compact motor. No announcement has been made regarding colors or finish.

In addition to the touring car body, the chassis will be supplied with coupé and taximeter cab bodies, listing at $950 thus equipped, and with private town car bodies at $1,000. These will be ready November 1. Runabout and roadster models will be announced later.

Vanadium Steel.—This material is used for all shafts, gears, axles, springs, and many smaller and comparatively unimportant parts. The alloying of steel with vanadium has only recently become commercially possible. Until within three years ago the world's output of the pure metal was less than 200 pounds a month; in consequence its price was many times that of gold. But since then a large deposit of vanadiferous ore has been opened up in South America, and it is now on the market at about half the price of silver. As it is used only in "homeopathic doses," vanadium steel can be made at about the same cost as the best grades of chrome-nickel steel. It machines as easily and uniformly as low-carbon steels, and works beautifully under the forging hammer and dies, while in dynamic properties it is claimed to be much superior to any product hitherto tried. Its use throughout the car is a point on which the Ford Company lays great emphasis.

A BUDGET OF NEWS FROM THE PINE TREE STATE

PORTLAND, Me., Sept. 21.—With the coming of September the summer season in Maine may be said to be over. It has been a very successful one in the automobile industry, better than was expected in view of the great financial disturbances of last October. All during last winter there was much talk among prospective buyers, for the financial stringency did not seem to hit this section very heavily. Cars of all kinds sold readily in Maine this year, but the smaller type seemed to be in much the greater favor, though the large touring cars were not by any means neglected.

During the past season there have been hundreds of visitors to the State. Complaints have been general in regard to the conditions of the roads in the western part of Maine, but once east of Portland, the tourists have had few kicks to register. The Glidden tour and the Ideal tour, both of which passed through Portland, proved the main events of the year.

Registration Figures Tell a Story.

No better idea of how the automobile trade has grown can be obtained than from the figures of registration at the office of the Secretary of State in Augusta. From the figures on file it is learned that the total amount received in fees for the registration of automobiles from the time the law went into effect, June 1, 1905, to September 1 of the current year, was $6.108; from licenses issued to operators, $7,126; from registration of motorcycles, $662; from licenses issued to dealers, $790; making a grand total of $14,686.

As might be expected, the business for the past month approaching as it does the latter part of the season, shows a falling off compared with that of some of the other months of the year. The number of automobiles registered during August was 93; the number of licenses issued to operators was 113; one license was issued to a dealer and twenty motorcycles were registered. The amount received in fees was as follows: Registration of automobiles, $186; licenses to operators, $226; dealers' licenses, $10; registration of motorcycles, $40, a total of $426.

The total receipts in fees for the past eight months of the current year are as follows: Registration of automobiles, $1,632; for licenses to operators, $1,862; dealers' licenses, $200; registration of motor cycles, $206, making a total of $3,900.

An index of the rush during the spring is obtained from these figures of the registration of automobiles during the first eight months: January, 8; February, 6; March, 36; April, 129; May, 169; June, 297; July, 168; August, 93.

Licenses to operators during the same period were issued as follows: January, 9; February, 5; March, 35; April, 135; May, 190; June, 230; July, 214; August, 113.

In the registration of motorcycles no applications were received until March, when four certificates were issued. Monthly registrations since that month have been as follows: April, 24; May, 17; June, 18; July, 20; August, 20. The number of licenses issued to dealers during the past eight months was 22.

A Rush of Hunters to the Maine Woods.

Every year an increasing number of automobile parties passes through the lower part of the State bound to the hunting camps in the northern woods. Many of the machines carry full camping outfits, including tents, cook-stoves and provisions. The roads are none too good, but this only furnishes an additional spice of adventure.

LAMPS WITH BESNARD SYSTEM OF ECLIPSING.

By RICHARD H. WELLES.

The use of acetylene gas for use in automobile headlights is undoubtedly the most popular form of light for automobile use at this time. Their efficiency in the country, where a long and penetrating beam is necessary, has been proven satisfactorily, but for city use they have been a constant source of criticism

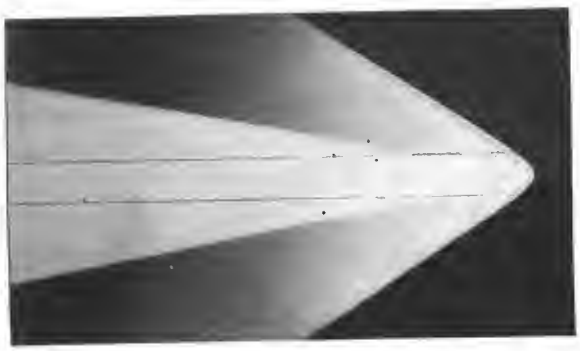


Fig. 1.—Showing double rays and two distinct fields of light.

because of the blinding glare coming from the parellel beam of the lens reflector. This objectionable feature has been overcome in the Solarclipse lamps, manufactured by the Badger Brass Mfg. Co., in this country. Several bills are up before the different State legislatures which, if passed, will compel the user to adopt a lamp embodying the "eclipsing" feature.

The Besnard system has been very popular abroad, and the United States patent rights are now owned by the Badger Company. This system seems to have solved the problem of headlights, for in this lamp are embodied all the essentia ldetails of the popular Solar light, besides having an arrangement attached by which the longer and blinding rays may be shut off at will by simply working a lever on the dashboard. Acetylene lamps for road use have two sets of rays, one from the lens mirror—the objectionable one for city use—and the other are the diffused or short distance rays, coming directly from the flame. If the long, penetrating rays could be shut off we would find that the shorter rays would answer every purpose for city streets. This the Solarclipse lamp and shutter does.

The manner in which the light is distributed may be seen in Fig. 1, which shows the double rays—two distinct fields of light. The first are the more intense, parallel, or long-distance rays, more powerful, and of greater utility to the driver, but blinding to the approaching road users. These rays consist of the rays

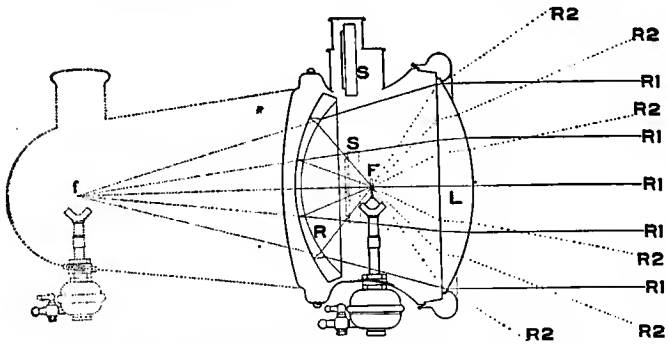


Fig. 2.—Showing special combination of the hyperbolic curve of the reflector and the plano-convex lens.

of light which eminate at the back of the flame *F*, and, striking the reflector *R* of hyperbolic curve, are reflected and directed against the plano-convex lens *L* in front of the flame, by which they are focused and refracted in long parallel rays of great penetrative power, shown by the lines R^1, Fig. 2.

This special combination of the hyperbolic curve of the reflector and the plano-convex lens permits the use of a lens of large diameter and long focus in a comparatively small lamp, see Fig. 2. The dotted lines back of the reflector in Fig. 2 show the depth of lamp that would be necessary to obtain a like powerful result if we did not use this patented hyperlenticular combination. The second are the diffused or wide, short distance rays, produced by th light rays, which eminate from the front of the flame, and are thrown directly on the plano-convex lens. These rays, magnified and rendered much clearer by the lens, diffuse at a wide angle at the side of the vehicle, as indicated by the dotted lines *R 2*, Fig. 2, and are not blinding to anyone approaching. Refer again to Fig. 1, and eliminate the lighter or narrow ray. The remaining field of light after the long-distance ray has been eclipsed will plainly appear. This wide beam of light now thrown by the headlight extends about 35 yards, and gives perfect front and side illumination.

When the shutter (*S*, Fig. 2) is up in the heat hood, held there by a spring, the light from the lamp is ready for the road, but by working the lever on the dash the spring is released and the shutter comes down, eclipsing the effect of the lens mirror at the back.

The mechanism which operates the shutter consists first of the operating lever at the back of each lamp (see Fig. 3) which,

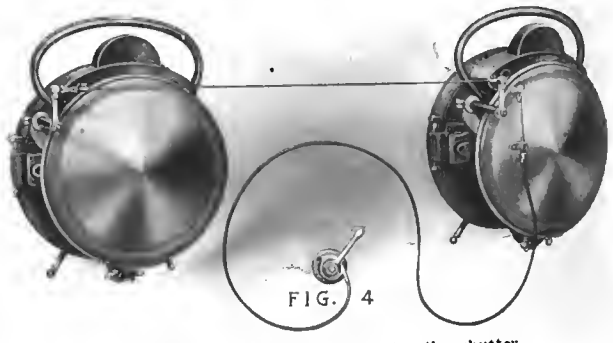


Fig. 3.—Mechanism which operates the shutter.

when pulled down, brings the shutter into eclipsing position. For use on a machine, so that the two lamps may be operated at once, the levers, of the two lamps, are connected by a piece of piano wire. By the use of Bowden flexible wire the right-hand lamp may be connected to any convenient place on the dash or the steering post.

EXAMINATION OF PREMIER CENTURY CAR.

INDIANAPOLIS, IND., Sept. 19.—After eight hours of careful and thorough examination of the Premier "100 miles for 100 days" car, David Beecroft and Berne Nadall, of the Chicago Motor Club, reported that every part examined was found to be in exceptionally good condition. Not a single case of breakage or distortion due to faulty workmansbip or design was discovered.

The members of the technical committee were passengers in the "Century" car on the last 100 miles, and were told to take charge of it for that day. At the completion of the test, which took place at Michigan avenue and Twenty-third street. Chicago, the two odometers showed 12,189.6 miles and 12,246 miles respectively. The last 43 miles was made use of by the committee for observations on the running and general performance of the car, partly over boulevards and partly over rough country roads. An excellent opportunity was afforded for noting the working of the motor, the efficiency of the brakes, and the general stability of the car. There was not a single indication of looseness or derangement in the running gear or steering.

After the end of the run the car was completely disassembled and all the working parts were examined. The final conclusion of the committee was that the car could endure a repetition of the same mileage without the necessity of overhauling.

HOW ORVILLE WRIGHT'S AEROPLANE FELL

WASHINGTON, D. C., Sept. 21.—Wright brothers' aeroplane, which everyone believed would be bought by the United States government, September 28, lies a pile of broken sticks and torn cloth in the hangar at Fort Myer, Va. A guard watches over the remains and warns with the danger of court-martial anyone who wishes to enter the building. The man who has stood in the world's limelight for the past two weeks, who has been accepted the world over as the subjugator of the upper air, lies in the post hospital, so severely injured that he may not be on his feet again for twelve weeks. Lieut. Thomas E. Selfridge, of the Fifth Artillery, has with his life paid the first toll of the government for success in aerial navigation.

Like those of the public fortunate enough to see the Wright aeroplane aloft, the United States government, represented by the Secretary of War and the Board of Tests of the Signal Corps, feels satisfied that the acroplane that came to earth is a success. The government wants another like it, and Orville Wright will deliver it. But the inventor, lying in the hospital, already sees where he can improve the type of the aeroplane, and he will be thinking and planning the three long months that he must lie inert. Then we may expect something better.

In the meantime, the Board of Tests expects that along will come A. M. Herring, from his shop off Broadway, about Sixty-sixth street, New York. He is due in Washington October 13. The government expects him with a great deal of interest, for much has been written about him, and he himself has said much about his ability to navigate the air successfully—automatically, he would have us believe.

That this terrible catastrophe of last Thursday will retard aviatory progress for some time, those who see below the surface do not believe. Wilbur Wright, with a machine almost identical to that of Orville, will not delay his demonstrations abroad. The followers of sky motoring consider this accident to be an incident of success, and will act accordingly; that is to say, the work will go on almost as if nothing happened.

It would require a volume to enumerate with explanations the theories that have already been advanced as to just how the break in the propeller occurred, and the causes. All that anyone knows is that the accident was caused by a broken propeller, except Wright; for he probably has figured it out. It is on what Wright said, shortly after his wounds were dressed, in word that he sent to his elder mechanic, Taylor, that the following opinion is based.

Wright said: "Look at that transmission."

There is no "transmission" on the aeroplane such as we have on the automobile. In automobile parlance, Wright would have said the "drive." For he referred to the two chains, one longer than the other, that transmit by chain the power of the motor from the crankshaft to the propeller shafts, one on each side of the afterpart of the aeroplane. These chains cross each other in performing their functions. Not an expert on aviation has seen this feature of the Wright brothers' flyer for the first time but that he has exclaimed, "Oh, cross-chain drive!" One can readily see that the crossed chains had a tendency to pull the propellers together. After the machine struck the ground it was found that the shaft of the broken propeller was badly bent inwards, that is, toward the opposite propeller. The angle-iron that had supported it was almost completely loose, and entirely from the bottom fastening.

The propellers used were not "new," except in the sense that they had not been used before at Fort Myer. They had been tested previous to the fatal run. But they were each eight inches, some say a foot, longer than those used for the record flights that made the world believe in the simple-looking machine.

From the appearance of the fracture there seems to be no way in which the accident could have occurred unless this angle-iron loosened, allowing the propeller to slip inward, drawn by the chain. The other propeller, driving toward it and upon it, snapped off the end, and the spectators saw something that looked like a piece of paper flutter down to earth.

Wright heard and felt the shock, perhaps; at any rate, he reached for the cord above his head and shut off the gas supply of the motor. Then he apparently endeavored to glide down to the earth. For 40 feet, perhaps, he was partially successful. He said afterward to Taylor that if he had been twice as far from the ground he would have been able to regain control of the machine and to have landed easily on the skids. But this does not seem probable, for the aeroplane at the time of the accident was slightly inclined to manoeuver a turn. When Wright lowered the front balancer for the down glide, the machine seemed to slip off sideways in the air, at an angle of 25 degrees. Thirty-five feet from the earth it swung around on its already begun turn, and at the same time pointed more directly downward, so far, indeed, that the surfaces of the superimposed plans no longer pressed against resisting atmosphere. Finally, these planes were at right angles with the ground, the port end nearest the earth, the forward balances straight out ahead. It is probable that the port side and the forward balancer struck earth first and perhaps minimized, though slightly, the force of the contact for the main body of the machine, carrying Selfridge and Wright.

The passengers could not have jumped from the machine on account of the cross wires hemming them in on all sides. They might have slipped down between the wires and their seat, but there could have been no advantage in it, and they probably did not attempt to do so. When found, Wright's arm was about Selfridge. It appeared that he had endeavored to hold the lieutenant in the seat before the crash came, but as the machine came down head-on, the men probably left their seats, were pressed against the wires, while the apparatus fell on top of them.

HOW WILBUR WRIGHT IMPRESSES THE FRENCH PUBLIC

LE MANS, Sept. 17.—We are on the eve of great doings here. Wilbur Wright has been progressively training for flights that it is firmly believed by his followers will eclipse all previous records in heavier-than-air experiments. His best performance up to date is 19 minutes 48 2-5 seconds, made at an average height of 40 feet and over a distance estimated at 14 miles. The flight was made in the early morning in perfectly calm weather, Leon Bollee, M. Landry, Paul Jamin and Baron de Sennevoy being present to officially time the performance. There was apparently no reason why Wilbur Wright should have come down; his engine was running well, his gasoline supply was plentiful, and his handling of the machine was perfect.

Later in the day a second flight was commenced, but after 3 minutes 21 seconds in the air a gust of wind struck the aeroplane and carried it towards a group of trees. Wilbur Wright sought to overcome the shock; he raised the apparatus, attempted to turn short, but did not succeed, the left wing striking the ground. The engine was still running, but Wilbur Wright immediately cut out and settled down on an even keel a little more roughly than usual, it is true, but without inflicting any damage. When heeling over, however, the wing had suffered somewhat, the one which came in contact with the ground being the same that had been damaged on the racecourse a few days before. A couple of days will be required to make the necessary repairs,

after which it is confidently believed that an attempt at long flights will be made.

There is a Wright and an anti-Wright camp in France, the former believing that the American aeronaut has left all other experimenters far in the rear, and the latter party persisting in dubbing him a bluffer or an acrobat. There has been a change of opinion in the various newspapers regarding the stranger from Dayton. When the first flights were made the praises of the Yankee were chanted in chorus: the others were children, they had been merely playing at flying, they went aloft like a scared hen, they were incapable of action in a wind. Now that has changed and the criticisms are being directed towards the retiring aeronaut at Le Mans. It being impossible to deny that Wright knows how to fly, the criticism is put forth that his machine can only be managed by a person having gone through a long period of training, that it is too slow, and that no improvements have been made on it for several years. Probably the explanation of most of the journalistic criticism can be found in the fact that after the first favorable accounts Hart O. Berg neglected to hand out publicity money. When the broad hint was given that there should be some recompense for so much favorable comment, the equally broad reply was given that no comments were asked for and none would be paid for. Since then certain journals can see nothing good in the Wright brothers' apparatus.

Wilhur Wright Unofficially Breaks Time Record.

LE MANS, Sept. 21.—This afternoon Wilbur Wright took the world's record from his brother with a flight of 1 hour, 31 minutes, 51 seconds, covering a distance of about 60 miles. After three false starts the machine was successfully launched at 5:15. He at first showed unusual prudence, flying so low that he seemed almost to skim the earth, but on the thirteenth round he rose to a height of about 60 feet. The sun was just setting and the aeroplane made a picture which time and again drew cheers from the 10,000 spectators. In the gathering darkness the machine kept steadily on, with the regularity of an express train. Not until long after night had fallen did Wright shut off his motor and come lightly to the ground. The official measurement is only 66.6 kilometers, being taken between the flags at the ends of the field; in reality the distance was greater. That part of the flight before sunset, 53 minutes, is acceptcd in the contest for the Michelin prize.

A FRENCH NATIONAL AERIAL LEAGUE TO BE FORMED

PARIS, Sept. 17.—All France is alive with enthusiasm for aerial navigation. The public interest in balloons, dirigible airships, aeroplanes, aeronautical motors and their auxiliaries is patent to any observer; a further and more convincing proof of the desire of the French nation for supremacy in the air is to be found in the formation of the National Aerial League, a body founded by some of the most distinguished aeronauts and their supporters in France, and which, it is hoped, will group together hundreds of thousands of French citizens. The object of the league is declared to be to encourage aerial navigation in all its forms. With the funds provided by members it will hold competitions for acronautical motors, the forms of aerial propellers, researches in the best forms of aeroplane wings, long-distance flying competitions, etc., in a word to encourage by means of conpetitions and prizes, every form of aerial navigation.

To make the leaguc truly national, the annual subscription has been fixed at one dollar per membcr. On such a basis it is estimated by the organizers that 50,000 members will be obtained during the first month of existence of the league, giving a working fund of $50,000. In addition to ordinary members, life members are received on payment of a substription of not less than $20; special prizes, to be named after their donators, will be offered whenever a sum of not less than $200 is paid into the treasury.

Those responsible for the formation of the league are M. Deutsch de la Meurthe, M. Archdeacon, Armengaud, and Quinton, all men who have already contributed large sums towards aerial competitions. Leading aeronauts interested in the league comprise Farman, Delagrange, Bleriot, Levavasseur, Esnault-Pelterie, Capt. Ferber, Julliot and Kapferer.

DELEGRANGE MAKES A NEW EUROPEAN RECORD

PARIS, Sept. 17.—For the present the European aeronautical record stands at 29 minutes 53 4-5 seconds, obtained by Leon Delagrange at Issy-les-Moulineaux. What it will be in seven days from now it is impossible to say, but it is practically certain that it will be still higher than at the present moment. Already the arrival of the news of the flight of more than one hour by Orville Wright has quickened European aeronauts to greater activity.

Leon Delagrange's record was made in the early morning in the presence of Captain Ferber, Achille Fournier, Rene Gasnier and others. Almost as soon as the Antoinette motor was started up the biplane apparatus rose in the air and made fifteen and one-half circles around the field, covering a distance estimated at 15 1-8 miles before gently scttling down to the ground with its five-gallon gasoline supply exhausted. The performance beat the record of Henry Farman with 20 minutes 19 3-5 seconds at Issy on July 6.

The following day Delagrange attempted to beat his own record, but again, owing to lack of fuel, just fell short of half an hour, his time aloft being officially certified at 28 minutes 11-5 seconds. Preparations had been made for a longer flight, but this was rendered impossible by a leakage from the gasoline tank, the apparatus being obliged to come to earth after a most successful flight in a rather strong wind.

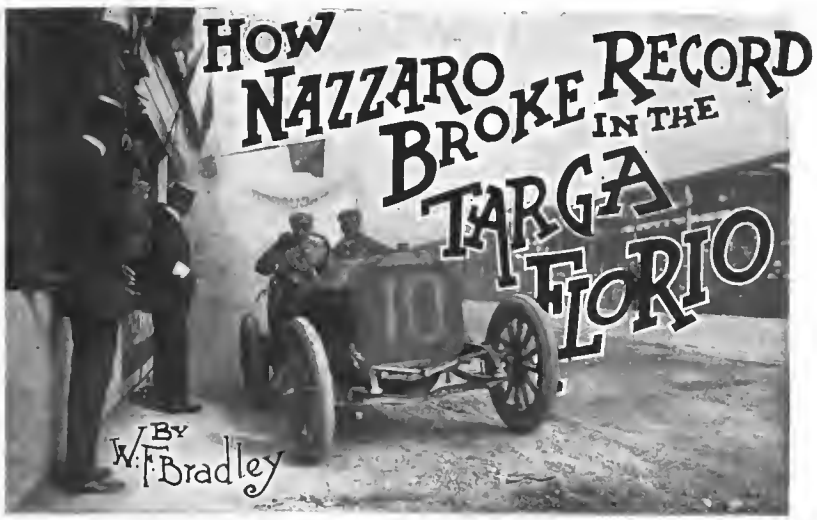
French aeronauts are now anxious to make an hour's records, and both Delagrange and Farman will train every day with this objcct in view. The newly-formed National Aerial League has offered a special money prize of $200 to the first French aeronaut who will double Wilbur Wright's present record of 19 minutes 48 2-5 seconds.

"REPUBLIQUE" OFFICIAL TEST SUCCESSFUL.

PARIS, Sept. 17.—*Republique*, the government dirigible airship, has completed all her official tests and trials and will be deflated in a few days in order to allow her place to be taken in the shed by Lebaudy to be fitted out as a training ship. The last trip of *Republique* was a voyage of eight hours, during which she evolved for a long time over Paris, then sailed off to the northeast to Compiegne, where further evolutions were made.

PREPARATIONS FOR INTERNATIONAL RACE.

BERLIN, Sept. 17.—Preceding the Gordon Bennett aeronautical race, scheduled for Sunday, October 11, there will be an official reception by the German Aeronautical Federation at Berlin on October 9, and on the following day a long-distance and a landing competition. The start of the international race will be at Schmagendorf, in the suburbs of the city, to which spot all balloons and material must be dispatched not later than October 8.



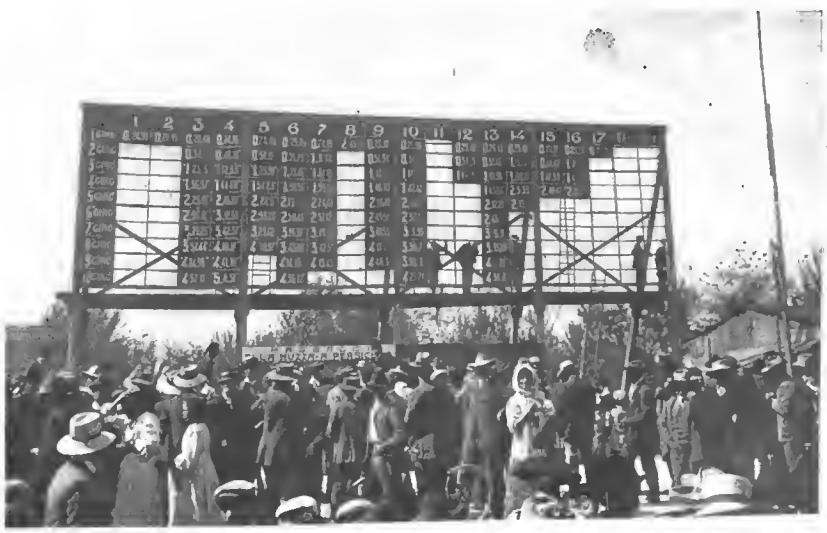
Nazzaro Halts In Front of the Grand Stand to Confer with Officials.

BOLOGNA, Italy, Sept. 6.—Felice Nazzaro has abundantly proved that the setbacks of the opening part of the season were but a temporary clouding of his brilliant career. By this Sunday morning's performance on the flat course in the neighborhood of the old world town of Bologna he has won the Florio Cup and the Coppa d'Italia for Fiat, the Cup of the Automobile Club of Genoa and the Targa Florio for himself. In addition to the quadrette of cups and the bag of gold to which he is entitled, Nazzaro has the satisfaction of beating all existing records for long-distance speed on roads. The 328.2 miles were covered to-day in 4:25:21, which is at the rate of 74.3 miles an hour. The previous record was 70.61 miles an hour, also established by Nazzaro, in the Grand Prix of 1906.

Not only was the race the fastest ever run, but it was one of the most interesting and keenly disputed that Europe has known. There were seventeen starters, representing two Italian firms and four French, all using the special 155-millimeter bore cars built for and run in the Grand Prix at Dieppe. Germany having kept out of the affair, the race resolved itself into a dual between the Fiats and Italas, which had failed to make a good exhibition in the earlier race, and the Lorraine-Dietrich, Bayard-Clement, Mors and Motobloc—all French—which had failed to hold the French trophy for the land of the tricolor. In their own exaggerated language, each was for "revenge"; it was Italy that finally got it, after a magnificent fight.

Duray, as irrepressible as ever, first shot over the line on his big blue Dietrich, regarded as a stout champion for France. Gauderman, driving a Motobloc, failed to evoke a cheer, the best that was expected of him being a regularity display. Demogeot, the big cool-headed driver of the Mors, carrying No. 3, had plenty of partisans, though it was known that his car was two or three miles an hour slower than some of the others. Lancia, of course, evoked a roaring cheer as his Fiat shot away, followed a minute later by Gabriel on the Bayard-Clement, generally admitted to be the fastest car of the whole group. Cagno took No. 6, Itala; Minoia the No. 7, Dietrich, and Charles Faroux, ex-trolley car motorman in Milwaukee, at present Parisian journalist, took the wheel of No. 8, Motobloc—it was his first appearance in a pure speed test. After Garcet had gone on the second of the Mors cars, Nazzaro raised the cheer of the day when he and his Fiat started on the run of three hundred odd miles at a terrific pace. Hautvast and his exceptionally long-stroke Bayard-Clement were looked upon by the French just as likely to win as the Italian favorite Nazzaro. Henry Fournier steered the Itala which had been tuned up to a slightly higher speed since the Dieppe race. Trucco, the Italian, took the last Dietrich, Landon the last Mors, and Wagner the French ex-Darracq champion had the third Fiat. America had her only representative in Elliot F. Shepard, driving No. 16 Bayard-Clement, which had been handed over to him but a couple of weeks before owing to an accident to Rigal. The American had the lightest car of the team and the heaviest mechanic, a man who on account of his enormous size and weight had naturally to be dubbed "Baby." Piacenza closed the march with the third of the patriotically-named Italas, and then the race was on in good earnest.

Less than half an hour after the start, Duray had roared by again on his Dietrich, the time which was hoisted up on the board a minute later being 24:55 1-5, which for the 32-mile course works out at the merest fraction under 80 miles an hour. Lancia got ahead of both Gauderman and Demogeot on the first round, scoring 24:16, or just over 80 miles an hour. Gabriel maintained his position behind the Fiat and had just roared by when Gauderman's failure to appear in position was explained by his arrival with the left front tire and rim missing. He stated that the rim, which was a new Vinet with some modification which had not been previously tested, had flown off on the straightaway. He was able to hold the car to the road, but had to retire immediately, for the fixed rim was flattened beyond repair. The accident caused comment, for it was feared that there was going to be a repetition of the Dieppe rim accidents,



The Big Official Score Board and the Crowd In Front of It.

Minoia Changes a Tire on His Dietrich.

against which, however, careful advance provision had been made.

It was probably owing to this fear of rim failure that numerous changes had been made since the Dieppe race. The Michelin people had slightly modified their rim by the addition of a raised section opposite the valve, and a special pin to prevent the single locking turnbuckle getting out of vertical. It proved successful, not a single accident or mishap occurring. The Dunlop rim found a place on the rear wheels of several of the cars, but no driver would accept it for the front, the opinion being that it was too heavy, and that its powerful lock threw the wheel out of balance sufficiently to interfere with the steadiness of the car at highest speeds.

Minoia furnished the highest rate of speed on the initial round, his Dietrich getting round in 24:15 2-5—over 80 miles an hour. Lancia came next, followed by Wagner, Gabriel, Duray and Elliot F. Shepard. Hautvast, the American's team mate, failed to make the initial round with No. 11 Bayarad-Clement. His own explanation was that the steel-studded tires refused to hold when he applied the brakes to make one of the right-angle turns. He skidded as if he were on soap, had to choose between the spectators and the ditch and went into the latter, his car broken, but without a scratch to himself or mechanic. Charles Faroux was unable to finish the initial round, one of the universals between the gearbox and the countershaft having developed weaknesses during the first ten miles.

Lancia jumped into second position during the second round, getting over the course in the record time of 23:24, or at the killing pace of 84.3. It delighted the spectators, nine-tenths of whom were Italians, and the sight was really terribly impressive, for the speed past the grandstand, on a perfect straightaway, with a very slight down grade, must have been close on 90 miles an hour. Wagner got second position, followed at three minutes by Henry Fournier, who had jumped in one round from ninth place. Nazzaro was maintaining a steady pace in fourth position, while Elliot F. Shepard was at the end of the list with Landon of the Mors team to keep him company in the same class.

Lancia Making a Replacement of Tires.

Henry Fournier made a fine struggle with Lancia during the third and fourth rounds. On passing the grandstand at the end of the second round the Italian had a lead on the Frenchman of a fraction over three minutes. By the end of the second round Lancia and his Fiat had increased the distance from the Itala by exactly one minute. Fournier, however, was hard after him, and by some of the most dashing driving ever seen got past the Fiat and won first place. His triumph, however, did not last long enough to be officially recorded, for on arriving at the last bend before the grandstand straightaway he went into the ditch but a yard from Hautvast's Bayard-Clement. Fournier was certainly going too fast; he failed to notice the slow sign until he was immediately under it, and was then handicapped by a cloud of dust raised by Cagno, who was just ahead. He thought he had got clear round, when the left rear wheel slipped off into the ditch, and it was all over. Fournier was slightly cut about the mouth and had bruises on various parts of the body; his mechanic escaped with just as little injury.

Duray on the Dietrich and Piacenza on the Itala had both failed to appear after the first round. The fate of the latter was not known until the end of the meet, when he drove in and explained that a disarrangement of the timing gears had obliged him to dismount the lower half of the crankcase.

The mystery about Duray was explained, just when Nazzaro had worked into first position, by the slow arrival of Wagner's Fiat with Duray and Mechanic hanging on behind. In the white jersey decorated with the Lorraine cross Duray had a portion of an exhaust valve which told the story of his undoing. One of the exhaust valves had broken, dropped into the cylinder and quickly done damage that was beyond a roadside repair. Wagner was also entirely out of the running, with a front axle that had broken exactly through the middle. It was an unusual mishap, that might have been due to crystallization or to an unusually severe shock when passing over a lump on the road, the car going up and dropping down on one wheel. The axle really looked as if it had been cut through with a hacksaw. Wagner made a temporary repair with a log of wood and a few lengths of rope.

Though seven cars had gone out during the first four rounds, there was no lack of interest at the tire and gasoline station, the course being but two miles round and therefore providing frequent passages. The killing pace was having its effect on tires, which were being changed by some of the drivers at the rate of almost one a round. When they were pulled off most of the tires were mere masses of pulp, so hot that they could not be touched, and smelling like a vulcanizing establishment.

At the end of the fifth round, while leading by less than two minutes on Trucco's Dietrich, Nazzaro pulled in at the grandstand, jacked up the rear of his car and changed both tires. This was the only work he did at the tire station, one other tire being changed on the road; the front tires went the whole distance. Smooth Michelins in conjunction with the new and modified rim were employed. On arrival at the grandstand a large sized bird was flattened out against the radiator of the Fiat, giving an indication of the speed at which the car had been traveling.

The struggle was now between Nazzaro, Trucco (Dietrich), Lancia, Garcet (Mors), all of them so well grouped that although Nazzaro was leading the final issue was doubtful. During the sixth round Lancia's ill-luck attacked him in the form of the breakage of an overhead rocker arm, the replacement of which at the central tire station occupied about twenty minutes and removed all possibility of first place.

During the sixth round of the leaders it was learned that both Landon (Mors) and Elliot F. Shepard (Bayard-Clément) had been put out of the game. The Mors driver failed to make one of the turns, shot off the road and landed in the canal containing 12 feet of water. Fortunately the men were not pinned underneath, and a few minutes later were on the road again. Consid-

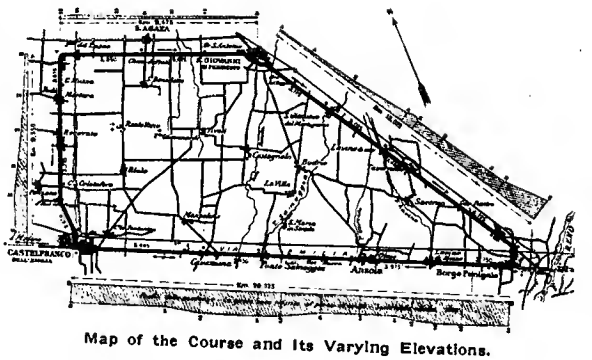
ering the fall, it was surprising how little damage had been done: one driving chain had been torn off, the hollow countershaft had snapped in two and the exhaust piping had been carried away. Every other part was intact. Elliot F. Shepard explained his accident when he drove into the paddock at the end of the fifth round. The left rear tire burst and locked the wheel with such violence that the rear axle casing made a half circle, the truss rod being broken off and brake connections snapped. Most of the bolts having been sheared, one-half the axle casing began to come away from the differential housing. Though it was possible to run the car, speed was out of the question. Shepard therefore remained in the paddock until the end of the race, then ran back to town, carrying his wife with him on the racer.

From seventeen the number of competitors had been diminished to eight: Nazzaro (Fiat), Trucco (Dietrich), Cagno (Itala), Minoia (Dietrich), Gabriel (Bayard-Clement), Demogeot and Garcet (Mors), and Lancia (Fiat). Trucco was running almost neck and neck with Nazzaro, Carcet might have been really dangerous had not a leak sprung up in his radiator system, obliging him to carry a jug of water with him; Demogeot and Minoia were gradually increasing their speed, while Gabriel and the powerful Bayard-Clement surprised and disappointed the French and their supporters by remaining in fifth and sixth position.

But it was not Gabriel's lot to finish, the overhead exhaust valve of the second cylinder breaking off and falling in, just as had happened to Duray's Dietrich. There were now seven struggling for victory, the two Dietrich's and the one Itala being so dangerous that they all beat Nazzaro on the eighth round. Lancia, too, was coming to the attack again, after his long delay, and seemed capable of gaining one or two places.

When the red No. 10 roared by on the last round, with victory certain for Nazzaro barring accidents, the cannon boomed and the grandstand got ready for a rousing reception. They were not disappointed, for 27 minutes later, with a margin of nine minutes in his favor, Nazzaro was the winner of the Florio cup, disputed for the third time. With one voice the grandstand roared: It was more than a national victory, it was the triumph of the favorite. Five minutes later the car had been run into the official garage, Nazzaro had spent half a minute in the ambulance tent to have the dust wiped out of his eyes and was being conducted across the road for the official presentation to the Princess Laetetia. This man, who had been driving at more than seventy miles an hour for over four hours, was as clean as on the morning he presented his dainty-looking car for the official inspection.

While Nazzaro had been making sure of first place there had been a keen struggle between Cagno (Itala) and Minoia (Dietrich) for third position, second place already being assured to Trucco. The Dietrich would certainly have got third in addition to second place, but for the collapse of one of the front wheel bearings, on a curve ten miles from the finishing point. This



Map of the Course and Its Varying Elevations.

gave Cagno his chance, and the Itala finished third, followed by Demogeot on the Mors at one minute's interval. Lancia came in fifth and Garcet on Mors sixth. Had the race been five miles longer, Demogeot would certainly have got third place, for the Itala which beat him had one of the rear dumb irons broken off, sending the axle adrift, and lost all its water after standing a few minutes in front of the station. The result of the race was thus as follows:

Fiat, Nazzaro	4.25.21	Average 74.3 miles
Dietrich, Trucco	4.34.7	Average 71.8 miles
Itala, Cagno	4.56.12	Average 66.4 miles
Mora, Demogeot	4.57.11	
Fiat, Lancia	5.08.51	Average 83.7 miles
Mora, Garcet	5.22.7	Average 61.1 miles

Though no troops were employed on the course, order was perfect with the exception of a slight incident at the end. After the arrival of the second car the crowd invaded the course and half a dozen cyclists—cycles are as common as macaroni in Bologne—mounted their machines for a quick run home. Duray, who had been a spectator since his accident, sent forth a war whoop, seized the first cyclist, knocked him to the ground and flung his machine into the Dietrich gasoline station. Somebody from the top of the tire stands flung down an empty wooden box on the heads of the invaders, the committeemen acted vigorously, for a racing car might have appeared at any moment, and in a few minutes the road was clear again. There was none of the grandstand decoration that characterized Dieppe, but there were few points of the organization which could be criticized. The tarring of the road was especially well done.

Contrary to what had been generally published, Nazzaro has no intention of abandoning the racing game at the end of the season. His marriage with a Turin lady is announced for next spring, but this will not cause him to abandon racing. Lancia, on the other hand, will cease to figure at the wheel of racing

HOW THEY FINISHED IN THE CONTEST FOR THE FLORIO CUP—DISTANCE, 328.2 MILES.

CAR	Driver	1st Lap	2d Lap	3d Lap	4th Lap	5th Lap	6th Lap	7th Lap	8th Lap	9th Lap	10th Lap	Miles per Hour
FIAT	Nazzaro	25:36	51:14	1:17:31	1:42:42	2:10:12	2:37:21	3:03:55	3:33:07	3:59:03	4:25:21	74.3
DIETRICH	Trucco	26:13	25:38	26:17	25:12	27:30	27:09	26:34	29:12	25:56	27:18	
ITALA	Cagno	25:49	53:46	1:19:34	1:45:24	2:12:15	2:43:00	3:09:03	3:35:20	4:07:19	4:34:07	71.8
MORS	Demogeot	28:49	27:13	25:48	25:50	32:51	24:47	26:03	26:17	31:59	26:48	
FIAT	Lancia	24:16	55:25	1:21:46	1:50:36	2:19:41	2:50:41	3:16:37	3:43:20	4:17:15	4:56:12	66.4
MORS	Garcet	26:10	29:34	26:23	28:50	29:05	31:00	25:56	26:43	33:55	38:57	
DIETRICH	Minoia	24:15	57:07	1:25:05	1:56:57	2:25:16	2:56:11	3:28:26	3:57:44	4:24:56	4:57:11	66.2
BAYARD CLEMENT	Gabriel	24:40	28:18	28:08	31:42	28:19	30:55	32:15	29:18	27:12	32:15	
MORS	Landon	35:10	48:10	1:12:33	1:41:10	2:15:30	3:12:58	3:42:37	4:10:17	4:41:10	5:08:51	63.7
ITALA	Fournier	25:42	23:34	24:23	28:37	34:40	57:28	29:41	27:38	30:53	27:41	
FIAT	Wagner	24:17	51:51	1:17:47	1:48:43	2:16:42	2:49:51	3:40:53	4:18:21	4:48:01	5:22:07	61.1
BAYARD-CLEMENT	Shepard	25:24	25:39	25:56	30:56	27:59	33:09	51:02	37:28	29:40	34:06	
DIETRICH	Duray	24:55	1:08:40	1:34:45	1:59:26	2:24:48	2:57:12	3:21:30	3:47:30	4:15:45	Broke front wheel bearing	
ITALA	Piacenza	25:26	26:59	43:31	24:41	24:42	33:04	24:18	26:00	28:15		
MOTOBLOC	Gauderman	28:15	58:15	1:25:59	1:54:25	2:27:35	2:53:20	3:23:42	4:30:32	Broke exhaust valve		
BAYARD-CLEMENT	Hautvast		1:05:03	1:30:27	2:05:33	2:33:07	Missed turn; went into canal.					
MOTOBLOC	Faroux		29:53	25:24	35:06	27:34						
			51:05	1:16:03	Missed turn; went into ditch.							
			25:23	24:58								
			48:47	1:17:35	Broke front axle.							
			24:30	28:48								
			1:07:34	1:40:38	2:10:41	Bent rear axle housing.						
			42:10	33:04								

Broke overhead exhaust valve.
Broke timing gears.
Lost dismountable rim on straightaway.
Missed turn; went into ditch.
Broke universal joint on cardan shaft.

cars, his own private business having assumed such proportions that all his attention is required there. In the Savannah race it is almost certain that the Fiat team will be made up of Nazzaro, Wagner and Duray, the latter being at the end of his term with the Dietrich people and ready to sign with the Italian house. As the result of the Bologna defeat French representation will be small in the Savannah race. It is practically certain that Bayard-Clement will engage two cars and Dietrich either one or two. The others will not participate from the present indications, and there is little prospect of a change of policy.

PORPORATO SCORES VICTORY IN TARGA BOLOGNA

BOLOGNA, ITALY, Sept. 7.—Berliet, a French firm that has never previously attempted to win speed honors, but occupies, nevertheless, an enviable position in Europe, has won the Targa Bologna hands down. Porporato, the Italian driver of the winning car, covered the 262.5 miles in 4:0:56, which is equal to 65.3 miles an hour—very satisfactory going for a four-cylinder car of but 120 millimeters (4.7 inches) bore. True to their fixed policy, the Lyons factory refused to enter a car in the Italian race, but gave permission to Porporato, one of their chief testers,

Porporato in His Berliet Winning the Targa Bologna.

to make any changes he liked on the standard model and race it on its own responsibility. Under the rules 130 millimeters is allowed all four-cylinder cars; the Berliet model measures 10 millimeters short of this, and it was with this handicap that Porporato set out to prepare for the race. He and his mechanic worked single-handed, the firm being so little interested in the race that not a single official from the factory was present when the call came for the designer of the racer to be presented to Princess Letizia.

The story of how the race was won is easily told. There were sixteen starters, thirteen of them being Italian and three French. Franchini, on a Bianchi, set the pace with an initial round covered at the rate of 73 miles an hour. Porporato was content with fifth position. The first round saw the Fiat and a Junior go out of business; then failures came so thick and fast that by the end of four rounds nine cars had disappeared through mechanical defects or road accidents, among the breakdowns being Vincenzo Florio's Darracq and the French Dietrich.

During this time Porporato and his Berliet had been reeling off rounds in 28, 29 and 30 minutes, working up to first position during the fourth round. During the fifth he stopped to replace a smooth Dunlop rear tire by a non-skid and to add a pint of water to the radiator, done without a stoppage of the engine. Later a rear tire ended its life with a loud report, the strain of a curve at 50 miles an hour having been too much for it. These were the only two occasions on which Porporato left his seat; from beginning to end the bonnet was never raised. Taking advantage of the rule which allowed the changing of wheels during the race, Porporato carried two spare front wheels, with inflated tires in position, on his rear brackets. They remained there, however, until the end of the race, for no tire trouble developed in front. Porporato declared that his reason for taking complete wheels in preference to rims was that the former could be changed quicker than the latter. The car being chain driven it was impossible, owing to weight, to set in the same way with the rear wheels.

A feature of the race was the absence of tire trouble. Although the speed attained was frequently 80 miles an hour, as is evident by the winner's average of 65, there was so little attention needed to pneumatics that for the first hour and a half not a single tire had been changed at the grandstand depot. On the previous day, when the winner's average was only nine miles an hour more, tire trouble was prevalent, showing that the 155 millimeter international rule has produced a car so fast that it is constantly in danger of failure by overstepping the limits of tire resistance. The lesson that has been forced home is that a bore of 130 millimeters is all that is required for the most powerful racers; beyond this speed is so great that there is a constant danger of mechanical lessons being lost owing to the failure of tires to support the strain. Doubtless the lessons of this season's racing will have the effect of deciding the international association to further reduce the maximum bore for racing cars.

Second place in the race fell to an S. P. A., handled by Appendino, who made a very slow initial round, but who immediately after jumped to the front and trailed Porporato for the last four rounds. Third place went to Buzio, on a Franco, another Italian combination. After being third and fourth for a long time, the Franco was obliged to dismount a portion of its carbureter, an operation that occupied nearly half an hour, despite the aid of a group of mechanics, and destroyed all hopes of a better position. Tangazzi's Junior went into fourth position; Maggioni's Zust got fifth place, and Piccoli's S. P. A. finished sixth. The rest abandoned before the eighth round had been accomplished.

As the result of the remarkably easy victory of the Berliet it is very probable that the firm will be represented in the next Grand Prix of the Automobile Club of France, more especially if, as is considered almost certain, the club decides to limit bore still further.

RESULT OF THE RACE FOR THE TARGA BOLOGNA—DISTANCE; 262.58 MILES.

CAR	*Driver*	*1st Lap*	*2d Lap*	*3d Lap*	*4th Lap*	*5th Lap*	*6th Lap*	*7th Lap*	*8th Lap*	*Miles per Hour*
BERLIET	Porporato	29:38	58:37	1:31:18	2:04:02	2:33:15	3:02:19	3:31:40	4:00:56	65.3
S. P. A.	Appendino	51:43	1:18:46	1:47:42	2:15:07	2:43:15	3:12:48	3:43:38	4:14:05	62.0
FRANCO	Buzio	29:05	59:27	1:33:56	2:06:28	3:06:15	3:38:32	4:11:04	4:40:57	56.0
JUNIOR	Tangazzi	39:06	1:19:36	1:55:16	2:27:57	2:58:53	3:31:43	4:09:38	4:43:49	55.5
ZUST	Maggioni	28:58	57:38	2:30:24	2:59:33	3:27:59	4:12:36	4:40:14	5:07:57	51.1
S. P. A.	Piccoli	29:09	1:02:18	1:31:28	2:53:23	3:34:00	4:09:44	4:42:59	5:15:41	47.7
JUNIOR	Manganotti	1:07:50	1:49:40	2:34:35	3:20:40	3:57:40	4:46:50			
BIANCHI	Brambilla	29:51	59:28	1:27:36	2:33:51					
FRANCO	Cariolato	37:33	1:10:56	1:48:47						
BIANCHI	Mayr-Franchini	27:05	54:40							
BIANCHI	Tommaselli	31:15								
DARRACQ	Ravetto	32:18								
DIETRICH	Parran	46:13								
DIATTO-CLEMENT	Primavesi	48:58								
FIAT	Vaccari	.....								
JUNIOR	Tamagni	.....								

USEFUL THINGS FOR THE AUTOIST TO KNOW

SECOND-HAND cars at a close figure are apt to have tires barely up to requirements of the tire manufacturers' guarantee. Such tires suffer from rim cuts and blow outs much more than tires a trifle larger, since the small tires have to be pumped quite hard, and even then flatten more under load than larger tires under like conditions. In purchasing a second-hand car it is well to consider the matter of tires somewhat carefully, and to figure on substituting larger tires if those used are under suspicion. A safe rule is to have the tires 1-2-inch in section for each 100 pounds of total load, including passengers and supplies. For example, a 3 1-2-inch tire should not carry over 700 pounds maximum. The tire makers have brought out two odd sizes of tires especially to take the place of smaller sizes without change of rim. These are the 31 by 4 and the 33 by 4-inch sizes. The 31 by 4 size will go on a 30 by 3 1-2-inch rim, and the 33 by 4 on a 32 by 3 1-2-inch rim, without changing the rim. Occasionally one finds a 34 by 3 1-2-inch tire which is too heavily loaded. Here one's best hope is that the felloe can be cut down for a 34 by 4-inch rim without seriously weakening it.

Looking Over the Lubrication Heads.

The oil and grease cups on joints of the steering gear, springs and other small bearings scattered about the car easily become clogged. It is not sufficient to see that the oil cup is filled with oil or that the grease cup is screwed down as far as it will go. Unless the oil actually runs in and the grease cup is observed to be slack after running, it is clear that the bearing is not receiving lubricant, and the best thing to do is either to force kerosene in, or, better, to take the bearings apart if possible, and clean out the solid particles with which the oil passages are probably clogged. Pour kerosene through the "breathers" in the crankcase up to the normal level of the oil. Start the engine and run it two or three minutes, thereby splashing the kerosene thoroughly about the crankcase and valve mechanism. Stop the engine and draw off the kerosene, which will carry with it a considerable accumulation of dirt and metal dust from the bearings. Refill the crankcase with clean oil and run the engine again—without load—for a few minutes to insure that the oil is splashed to all bearings needing it. It is now safe to run the engine under load.

Oils for Gearbox and Rear Axle.

If the gearbox and rear axle have plain bearings, the oil must be considerably thinner than if ball bearings are employed. The reason for this is two-fold. A fluid oil allows the grit from the gears a chance to settle, and it enters the bearings more freely than a semi-solid lubricant would. For plain bearings, regular gear case oil is about right in warm weather, especially as it is thinned somewhat by the warmth received from the engine and exhaust pipe. In cold weather it may be necessary to thin the oil with kerosene to induce it to flow at all. If, however, ball bearings are used, or if the bearings are plain but are separately lubricated, including the telescope bearing at the end of the sliding gearshaft, it will be safe to add a double handful or so of grease to the gearcase oil, leaving it just soft enough to flow slightly when warm.

Possible Carbureter Trouble.

In case the motor fails to start readily on priming the carbureter, and the mixture is found to be over rich, it may be that the drainage hole in the carbureter is clogged so that the overflowing gasoline accumulates and makes too rich a mixture. This, of course, does not apply to carbureters in which the overflow of gasoline dries out on the ground without depending on a drainage outlet.

Safe and Unsafe Dust Pans.

Drain outlets should always be provided at the lowest point of the dust pan and at the bottom of any "pockets" it may contain. If this is done, gasoline accidentally finding its way into a pocket will not remain, and there will be no danger of its catching fire, something that is always imminent with collected gasoline.

USE OF TIRE CHAINS IN PARKS DECLARED LEGAL

THE American Automobile Association and the National Association of Automobile Manufacturers have won out in their fight against the constitutionality of the notorious ordinance of the New York Park Board, prohibiting the use of tire chains on park roads. Justice Davis has decided the ordinance to be illegal, unconstitutional and void.

The test case was conducted for the two associations by Charles Thaddeus Terry, chairman of the legislative board of the A. A. A. and counsel to the N. A. A. M., through a writ of habeas corpus in the case of a taxicab driver.

The ordinance was declared invalid by Judge Davis upon the following grounds:

FIRST: That it was in direct violation of the motor vehicle law of the State of New York, known as Chapter 538 of the Laws of 1904. Upon this point the court said:

"This statute contains a uniform and comprehensive plan for the regulation of the use of highways by automobiles, except in respect to speed, and forbids the adoption by local authorities of ordinances regulating that subject.

"The ordinance in question contrary to this statute excludes from the free use of the park highways all automobiles having chains on their wheels, even though they have complied with all the provisions of the motor vehicle law, and admits them to such free use only upon getting permission from the commissioner. For this reason the ordinance cannot be upheld.

"We may assume that the purpose of the rule is to protect the roadbed, although that does not appear from the record, but whatever its purpose may be, the effect is to regulate the use of automobiles whose owners make use of chains to insure their practical and safe operation over the highways of the parks when they are muddy, slimy, or otherwise slippery. As stated above, such regulation by the local authorities is forbidden by the statute referred to."

The court distinctly lays down the rule in its opinion that the State motor vehicle law is absolutely comprehensive upon the questions of the regulation of motor vehicles, and that it forbids all regulation of such by local authorities with the one exception of speed, and this only when the conditions prescribed by statute are complied with.

SECOND: Upon the question of the unconstitutionality of the ordinance, Judge Davis held that in conferring an arbitrary power upon the commissioners to discriminate between those to whom they shall grant permits and to whom they shall be denied, the ordinance denies the equal protection of the laws and is in violation of the Constitution of the United States and of the State of New York. The court said:

"It is a vital defect in the ordinance that it contains no provision guaranteeing uniformity in its enforcement. No rule or principle is provided to secure its impartial execution. Inequality in its enforcement is thus not only possible, but probable, and so it fails to insure equal protection to all persons similarly situated and for this reason it is unconstitutional."

The court further held that the ordinance was in violation of the Constitution of the State of New York and of the 14th Amendment of the United States Constitution in that it arbitrarily discriminates between chains and other devices used to prevent skidding of automobiles. Upon this point the court said:

"Why the owners of the chain device should be put in one class and those using the other devices in another and exempt class, is not at all clear. . . . Indeed one fails to discover any reasonable basis or principle whatever, justifying the placing of the chain method in a prohibited class by itself. It follows, therefore, that the ordinances make an unlawful discrimination against those who use chains as a part of their vehicle equipment."

This decision of the Supreme Court effectually establishes what has always been the contention on the part of the automobilists of this State.

THE AUTOMOBILE

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THE STATUS IN AUTOMOBILE RACING.

Automobile racing, at least for the moment, is of some substantial worth to automobiling in general. Therefore, it will be a source of general satisfaction to those manufacturers and their agents, who bear the brunt of the heavy expense, that an agreement has been reached in the so-called racing war between the American Automobile Association and the Automobile Club of America. The exact interpretation of the agreement signed by the officers of the two organizations may safely be left to the lawyers who were involved in the final understanding. It would appear that whatever friction may be engendered for a time by those interested in preventing harmony, will soon give way to the insistence of the common-sense of the men really responsible for the recently reached understanding.

The need for an organization like the American Automobile Association is absolute and recognized, whether it be composed of clubs, or individuals, or both. The big club in New York City also has its sphere of usefulness, and being located in the metropolis of the country, it possesses certain advantages over the clubs of other cities. The constitution of the international organization provides for only one club from a country, and the A. C. A. unquestionably was in on the ground floor in the pioneer days of automobiling, and that was how it obtained its "foreign recognition," which it values highly and which it has fought to preserve, and has succeeded in preserving. But the A. C. A. was unsuccessful in inducing the clubs of this country to desert the A. A. A. and acknowledge the New York City organization as the fountain head of national power. Therein it encountered defeat, for the American spirit of the American clubs will not accept the foreign idea of the autocracy of a single club in a country.

The great thing, however, is that both the Vanderbilt and Savannah races will now be successes—one is needed in the metropolitan district, and the other will be of benefit to the sport and industry in the South. The mere fact that the Vanderbilt race is called "national," though its entry list will be "international" in character, doesn't retract one whit from its prestige, nor its value, to whatever maker may be lucky enough to be first across the line. A generous entry is promised in both events, though had the "war" continued it would have meant competition of slight worth to those participating.

Therefore, let us concern ourselves with the two big races scheduled, and let the future more or less work out its own problems, for ultimately it will resolve itself into a question of what the manufacturers of America shall decide to support and how they shall support it.

* * *

GROWTH AND INFLUENCE OF THE S. A. E.

The many and varied phases that engineering endeavor naturally assumes, and the fact that while the engineer keeps track, in a general way, of the inventions and progress of lines other than his own, he is only vitally interested in the particular branch in which he is occupied, makes necessary the devotion of a separate engineering organization to each field. In order to achieve that degree of cooperation in the study of a number of problems that is necessary to their most practical and enduring solution, it is evident that all must be working toward a common end, and it was on this account that membership in some of the older societies proved of little, or no help, to the automobile engineer in his early struggles. Hence, the conception of the Society of Automobile Engineers, which held its third quarterly meeting for the present year in Cleveland last week.

The S. A. E., as it has now come to be known familiarly, first came into existence in the Summer of 1905, and like other movements of a similar nature, it suffered in its early days from a lack of attention on the part of its promoters, who found themselves, in the main, far too busy building cars or manufacturing parts to find much opportunity to devote to a study of how those things could be done to better advantage outside of the walls of their own shops. But the demand for cooperation and investigation, which had already been recognized by the manufacturers' association, was felt more than ever by those outside the latter, and the Society of Automobile Engineers not only continued to exist, but to slowly gain recruits in spite of the fact that its light was hidden most of the time. Since 1905, when it was created with a charter membership of less than 50, it has steadily continued to expand, and its growth during the present year has been such that it now numbers more than 200 members, among whose ranks are to be found many prominent designers and accessory makers.

VANDERBILT AND GRAND PRIZE OPEN TO ALL

A STOP has been put by the parties themselves to the so-called "racing war" between the American Automobile Association and the Automobile Club of America. The conference committees, which were in executive session for a fortnight, with the chief idea of making an adjustment of differences between the two bodies over the running of the Vanderbilt Cup race on Long Island and the Grand Prize contest at Savannah, concluded their negotiations last week and received the approval of their respective principals to the compromise agreed upon.

Following the endorsement and signing of the document, the following official statement was issued simultaneously by both bodies on Thursday:

IT IS AGREED that the Automobile Club of America is the only American member of the International Association of Recognized Automobile Clubs, and that it is and shall be the only authority in America for the drafting of rulee affecting and for the granting of sanctione for international races, and for the regulation of such races in this country. On the other hand, the matter of the sanction of and the formulation of rules for local and national races is agreed to be, as heretofore, in the sole power and jurisdiction of the association. The two bodies agree to cooperate with each other in making the Vanderbilt Cup race and the Savannah Grand Prize race successes. After the races of this year the two cups are to be deeded to an independent racing association, and are to be contested for annually, the Grand Prize Cup as the International trophy and the Vanderbilt Cup as the National trophy. It is also agreed that the club shall not encourage other clubs to withdraw from the American Automobile Association.

The essential pointe at issue between the two organizatione have thus been settled, and their cooperation in the future in all matters relating to the sport of automobile racing is aesured.

The full text of the agreement was made public by the club on Tuesday. It disclosed other concessions and pledges not embraced in the official statement at first issued. They embrace:

A definition of "national" and "international" racing in this country.

An agreement on the part of both bodies to hand over next year the Vanderbilt Cup and the Grand Prize to a corporation controlled by the Long Island Motor Parkway, Inc., on condition that it promote "national" and "international" races respectively for the two trophies.

The appointment of the Automobile Club of America as the sole representative of the American Automobile Association in foreign racing.

An agreement on the part of the Automobile Club of America to retire from the promotion of automobile racing after the running of the Grand Prize at Savannah.

A provision that the present "peace agreement" may be terminated upon the first day of January in any year after January 1, 1910, upon twelve months' previous notice in writing.

Pending a thorough understanding regarding the various clauses of the agreement, a joint committee from the A. A. A. and the A. C. A. will pass upon any differences that may arise in the premises.

The text of the agreement as given out by the club follows:

This agreement made this 11th day of September, 1908, by and between the Automobile Club of America, a membership corporation, created under the laws of New York, and the American Automobile Aseociation, a corporation created under the laws of New Jersey, witnesseth:

I. That the American Automobile Association recognizee and acknowledges the Automobile Club of America to be the sole American representative and member of the International Association of Recognized Automobile Clubs, and that as such it is and shall be acknowledged and recognized as the sole and unqualified authority for all international automobile affairs, including races and contests, in the United States of America.

An international race or contest is one which is announced or advertised as "International," or one which is open to entrants of America and foreign countries. Cars of foreign manufacture may be entered in a race or contest without making the same as "International" race or contest, provided, however, that such cars be owned and ENTERED BY AMERICAN CITIZENS, FIRMS, OR CORPORATIONS.

II. The Automobile Club of America agrees that after it has conducted the Grand Prize Race at Savannah, in November, 1908, it will RETIRE from the promotion of races, so long as International racing shall be conducted in the United States of America under the SANCTION of said club and in accordance with the RULES of the International Association of Recognized Automobile Clube, in as far as such rules ehall apply to the race in question.

III. The American Automobile Association agrees to have changed the conditions of the VANDERBILT CUP race, proposed to be held on Long Island, in the Fall of 1908, so that the same shall be a purely NATIONAL race and not International in character, and in that event the Automobile Club of America agreee to REMOVE ALL EMBARGOES and disqualificatione on such Vanderbilt Cup race, and the same shall be raced under the rules and conditions as now announced, except such conditions as would make it an International race, and the Automobile Club of America agrees to do everything in its power under these conditions to make such race a success.

IV. The American Automobile Association agrees that it will do everything in its power to make the GRAND PRIZE race at Savannah, proposed to be held in November, 1908, a success and to REMOVE ALL EMBARGOES and disqualifications against said race and to use its influence in having as many American cars ae possible to enter this international race.

V. That after the year 1908 the Automobile Club of America agrees to TRANSFER, under a proper deed of gift, its gold GRAND PRIZE cup to a corporation controlled by the Long Island Motor Parkway, Incorporated, upon the condition that the said donee each year promote and conduct an international race for the same, under the sanction of the Automobile Club of America and under rules then existing of the International Association of Recognized Automobile Clube.

VI. The American Automobile Aesociation agreee that after the year 1908 it will have TRANSFERRED to a corporation controlled by the Long Island Motor Parkway, Incorporated, the VANDERBILT CUP, upon the condition that the said donee will promote each year a national race for the said cup, under the sanction and rules of the American Automobile Association for national races.

VII. The Automobile Club of America agreee to make no attempts to encourage other clubs to withdraw from the American Automobile Aesociation.

VIII. It is hereby mutually agreed that the Automobile Club of America shall be the sole representative for the American Automobile Association for all foreign countries.

IX. Thie agreement shall be binding on both parties hereto until terminated, as hereinafter provided. It may be terminated upon the first day of January in any year after January 1, 1910, upon twelve months' previous notice in writing.

In witness whereof the high contracting parties have caused these presents to be signed by their duly authorized officers, the date first above written.

FOR THE AUTOMOBILE CLUB OF AMERICA,
(Signed) HENRY SANDERSON,
First Vice-President.
S. M. BUTLER,
Secretary.

FOR THE AMERICAN AUTOMOBILE ASSOCIATION,
(Signed) ROBERT F. HOOPER,
FREDERICK H. ELLIOTT,
Secretary.

How Foreign Cars May Enter Vanderbilt.

The status of foreign-made cars in the Vanderbilt Cup race is explained by Jefferson de Mont Thompson, chairman of the Cup Commission, to be as follows:

In view of the fact that the race for the selection of the American team has been cancelled and under the deed of gift a team of ten cars could compete in this race, the commission deeires to call the attention of American citizens owning foreign-made care, and American agents, whether firms or corporations, representing foreign-made cars, to the fact that care of foreign makes, irrespective of selling price, cylinder capacity, or other restrictions, save for in weight, are now eligible for competition in the Vanderbilt Cup race.

Arrangemente providing for a change in the character of the competition for this cup contemplate a change in the deed of gift, and the deed of gift has been changed by the donor, Wm. K. Vanderbilt, Jr., at the request of the Association.

The conditions provide simply for a classification by weight with a maximum limit of 2,644.8 pounds. The commission has also extended the date of entry without penalization, to October 1, and the entry fee of $1,000 will entitle a manufacturer to enter one, two, or three cars.

VANDERBILT AND GRAND PRIZE ENTRIES.

Two more entries added to the list of Vanderbilt Cup candidates quickly followed the announcement of the end of the "racing war." Clifford V. Brokaw has furnished an Italian contender by nominating an Isotta. The American entrants have been increased by the naming of a Matheson by the Matheson Motor Car Company, of Wilkes-Barre, Pa. This new aspirant for cup honors is not the Matheson that competed in the last race on Long Island, but a new car entirely with 6.1-inch cylinders. With Robert Graves' Mercedes, and a Thomas, a Mora, an Acme, a Chadwick and the two Knoxes, the list of entries already made

now reaches nine. The two Locomobiles promised practically raise the list to eleven. Entries will close on October 1.

Since the entry blanks and formal announcements have been issued, the engineers of the Parkway have reported that the work of construction is practically completed. The largest bridge on the parkway, which is at Central Park, was turned over to the cement workers last week. This bridge connects two long sections of the cement highway between Central Park and Bethpage, the Central Park and the grandstand.

All of the grandstand stretch is completed and cars have been running over it for some days. There is a little more work to be done between the grandstand and the western end of the parkway, but the bridges over intersecting highways in this section are open and the finishing touches can be put on in two or three days. This practically completes the eleven miles of parkway which forms a southern boundary of the 1908 Vanderbilt Cup circuit. The grandstand is about half completed. The telephone service has been installed around the entire circuit, and racing drivers who have been selected by the various entrants are preparing to open their headquarters on the parkway about the first of the month.

Fred J. Wagner, who is looking after entries for the Parkway Inaugural Sweepstakes, reports unbounded interest and enthusiasm in the trade over the novel event and is confident that at least 20 starters will await the word "go" on October 10. The division of the entrants into "thousand dollar" selling classes, the scaling of the entrance fees on the basis of price, the different distances to be run by each price class, and the fact that the entire field will race on the course together are proving popular with the makers and dealers, while the magnitude of the contest is arousing general public interest.

Entries for the Grand Prix at Savannah are at present set to close on the same day with the Vanderbilt nominations. The A. C. A. has a noteworthy international nucleus in the entries already made of three Fiat and three Benz cars. The Vanderbilt Acme was nominated this week and the entry of the Vanderbilt Matheson and of Mr. Buckley's B. L. M. racer also reported. A considerable foreign entry is already practically assured and a generous American participation probable.

The club has chartered the *City of Savannah* for its members. It will sail the Saturday before and return the following Saturday. There will be room for thirty touring cars aboard. The club is also arranging for special Pullman trains to leave Monday and return on Friday. Passengers on the steamer and trains will sleep aboard during their stay in Savannah.

NAZZARO WILL RACE AND MARRY LATER.

BOLOGNA, ITALY, Sept. 15.—There is no truth whatever in the announcement made about a month ago that Nazzaro would retire from the racing game this season. The marriage of the clever but modest Italian driver is fixed for the beginning of next year, but this will not interfere with his racing contract with the Fiat firm. It is now certain that Nazzaro and Wagner will be sent over to handle the Fiats engaged in the Savannah race on Thanksgiving Day. Lancia declares that he will not be at the wheel of the third car, his own business engagements in connection with the Lancia car making it impossible for him to travel to America. Though no official decision has been arrived at yet, it is exceedingly probable that Duray will have the third car. The Belgian driver is still connected with the Dietrich firm, but as his contract expires very shortly it is believed that he will be able to handle Lancia's car.

French participation in the Savannah race is not likely to be great. Dietrich may send two cars, and Bayard-Clément may be represented by Gabriel and one other. As to the rest, it is practically certain that they will remain at home. Demogeot is looked upon as a likely driver of one of the Dietrichs.

Ironton, O.—An automobile line between this city and Proctorville is now practically assured. A 20-passenger car will be used and two round trips will be made daily.

QUAKERTOWN'S STOCK CHASSIS RACE.

PHILADELPHIA, Sept. 21.—Five bona fide entries have already been secured for the 200-mile Founder's Week stock chassis road race, with excellent prospects of the limit of 20 entries, set by the committee being reached before October 7, the date of closing. The quintet already entered are: Maxwell, entered by the Tarrytown factory; American Locomotive, entered by Louis J. Bergdoll (who will also drive the car); Stoddard-Dayton, entered by the Hamilton Auto Company, Philadelphia agents; Peerless, entered by P. F. du Pont, of Merion, Pa., and Studebaker, entered by the factory and to be driven by Frank Yerger. Two Loziers, two Locomobiles, a Pullman, another Studebaker, a Pennsylvania, a Stearns, a Matheson, and a Renault are almost sure to be among the starters.

Contracts for the building of the grandstands and official stands have already been entered into; they will be located on the South Concourse, almost opposite Memorial hall.

The committee has decided to make the race 195 miles—25 times around the 7.8 mile course—and the knowing ones say that barring an epidemic of tire troubles, more than one can and will approach the mile-a-minute average. The only bad points on the course are the Sweet Briar hill and the swing into the Neill Drive from the West River Drive under a rather narrow railroad bridge. All the other turns are wide and gradual.

No road race was ever run off in this country over a course within 20 minutes' street car ride of a million and a quarter people, and for this reason the committee has decided to rope and fence off the entire course on both sides, in addition to using the 1,500 or 2,000 guards to be supplied by the city.

ANOTHER 24-HOUR AT BRIGHTON BEACH.

As was anticipated would be done, the Motor Racing Association has decided to run another 24-hour race at Brighton Beach, N. Y. It has set the dates for Friday and Saturady, October 2 and 3. At the meeting at which the decision was reached, pledges of 10 entries were received from members for the big race. Harry Lozier agreed to nominate the four-cylinder Lozier, which finished second in the last race, and Harry S. Houpt announced that he would substitute a Thomas Flyer for the Thomas Forty that was given a demonstration run in the first race.

Negotiations are in progress to secure Oldfield and Christie for one of their match races. A four-cornered six-cylinder match race with a Lozier, a Stearns, a Thomas, and an Acme as contenders, and a special contest with Oldfield, Christie, the B. L. M., the Fiat Cyclone, and the Fiat Tornado as contestants, are in contemplation as special features for Friday afternoon.

Improved camp arrangements, restaurant service, and track lighting are promised. The association received a sanction from the Automobile Club of America for the meet as an "international event." The association has also approved the Motor Parkway sweepstakes.

STRANG ENGAGED TO DRIVE RENAULTS.

Announcement is made by Paul Lacroix, manager of the American branch of Renault Frères, that he has signed Lewis Strang to drive Renault cars in future speed events. Every opportunity will be given Strang to drive in all the races of any importance in this country, and besides the racing cars which this company now has in America the arrival of one of the Grand Prix racers is expected soon for entry in the races at Savannah on Thanksgiving Day. A Vanderbilt Renault is a probability.

RYUS IN WHITE WINS LOS ANGELES RACE.

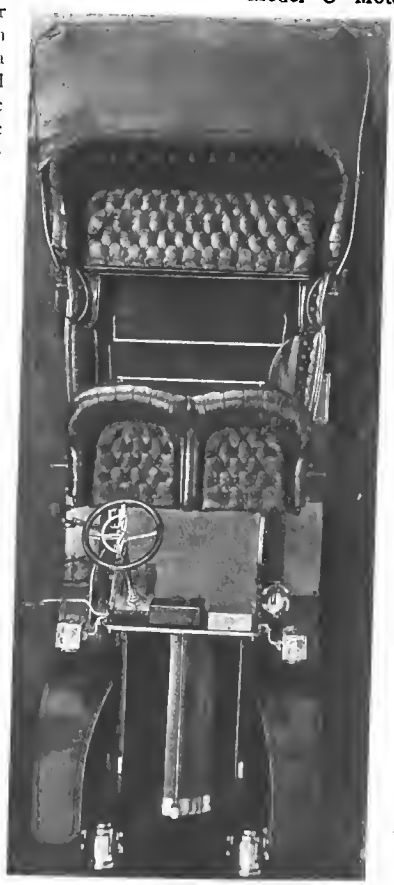
LOS ANGELES, CAL., Sept. 20.—The third annual 100-mile road race was run here to-day. A White steamer, piloted by H. D. Ryus, evolved as the winner. His time was 4 hours 34 minutes. Bert Latham, in a Kisselkar, was second in 4 hours 13 minutes. This is the third successive victory for Ryus and the White. Their time last year was 4 hours 30 minutes.

Knox 1909 Models

The 1909 Knox Model M from Springfield, Mass.—A Full-sized Touring Car of 50-horsepower Rating.

THERE will be three Knoxes for 1909, two water-cooled models and one air-cooled—the latter being for those preferring this type of motor construction. The following description applies to water-cooled types only, which are known respectively as models O and M. Model O is a 38-horsepower shaft-driven car, with motor, clutch and change-gear a unit construction, carried on a three-point support; whereas Model M, a 50-horsepower car, uses separate motor and transmission units, but carries each on a three-point suspension, it being also a chain-driven machine. Both models O and M will carry 1909 improvements in the matter of a three-disk clutch, replacing the cone type heretofore employed, and a modification of the intake and exhaust, as well as the intake and return water pipes of the motor. The changes in this piping greatly simplify the work of taking off the cylinder head, this being a separate part of the cylinder casting in Knox construction. Loosening the nuts retaining two yokes and taking off the nuts on the four studs holding the cylinder head in place, permits its removal for valve grinding or replacing.

Cylinder Construction.—The Knox cylinder design, having intake and exhaust valves in the cylinder heads and using a separate casting for the cylinder head, in order to waterjacket it more properly, results in a construction unique in American motor cars. The cylinder casting proper, with its integral waterjacket, has in its upper face a deep groove machined concentrically with the bore, into which fits a copper asbestos gasket; and in the cylinder head face is machined a circular tongue, which fits into the groove above the gasket. Four vertical bolts, which pass direct through the head, hold the two parts together. The water circulation, which enters the cylinder jacket at the bottom, is continued to the jacketing of the head through a short tubular connecting link in the form of a bridge casting, and the return flow is from the jacket part of the head to the radiator top. The inside of the cylinder head is also machined, so that the entire surface of the combustion chamber is smooth, and the capacity of the combustion chambers of the four cylinders as accurate as is obtainable. The maker claims that the smooth surface is less likely to retain deposits of carbon, and its freedom from short points or rough edges should eliminate preignition troubles from this cause also.



Knox Model O Seen from Above.

Model O Motor.—In this model the company continues the use of a unit power plant and three-point suspension, which is secured as follows. The upper half of the crankcase is formed with rearwardly extending arms, which encircle the flywheel and have their ends united by an integral transverse part, to which the front end of the transmission bolts, thereby uniting in one, for support purposes, the motor, clutch and gearset. This unit has its three-point support by a trunnion at the forward end, supported on a channel cross member, the ends of which rest on the frame pieces. The two rear supports are direct on brackets on the side members of the frame, lowered in order to secure a straight line drive from the crankshaft to the rear axle. According to A. L. A. M. rating, the model O motor is 38 horsepower, its cylinders having a bore of 4⅞ inches and 4¾-inch stroke. The intake and exhaust manifolds and the battery plugs are on the left, and the intake and return water piping, together with the short bridge pipes between the cylinders and the heads, on the right side. On this side also are located the high-tension magneto, toward the front, and the three-part group of oiler, timer and water pump at the rear. Intake and exhaust valves are made with integral head and stem and have the stems lubricated by carrying them through a gland. The usual rocker arm construction over the cylinder head is employed for opening the valves. Making the exhaust manifold in four parts allows for taking up of expansion through heating without transmitting any of this strain to the cylinders, and this manifold, as well as the intake, is securely anchored by four T-yokes.

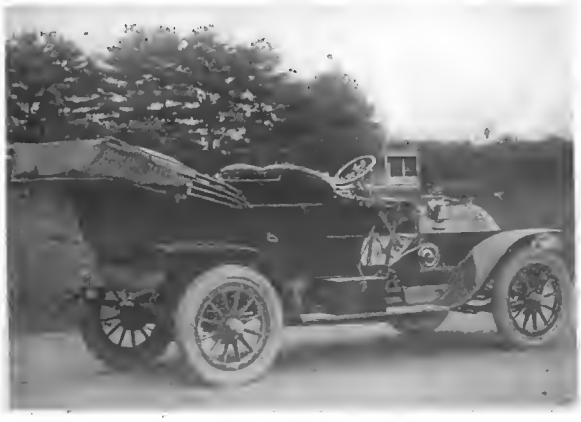
Gears and Gear-shafts of Model O, Dismounted.

Motor Accessories.—The oiling system is a positive feed, without the usual splash in the crankcase. At the right rear of the motor, and carried outside of the crankcase, is a gear oil pump driven by vertical shaft from the camshaft, which draws oil from the lower portion of the crankcase and forces it into a horizontal duct drilled in the upper half of the crankcase. From this are five branches to the five bearings of the crankshaft. Drilling the crankshaft in the usual manner conveys the oil to the lower bearings of the connecting rods, and drilling the connecting rods to the upper ends allows of forcing the oil to the wristpins, thus insuring a positive lubrication to the thirteen motor bearings.

The double ignition system consists of a gear-driven high-tension magneto, with wires direct to the plugs carried on that side of the motor, and a supplementary battery, Connecticut coil and timer, the latter on a short vertical shaft driven from the camshaft. The battery spark plugs are on the left side.

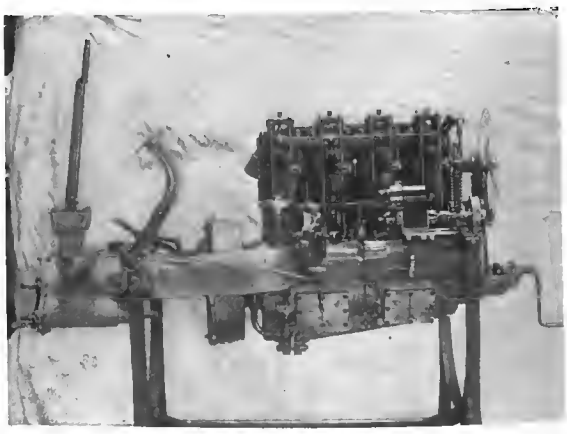
After considerable experimenting the company adopted the Stromberg carbureter, which is characterized by the transparent float chamber, spring controlled auxiliary air valve and water-jacketed mixing chamber. In the cooling system the pump maintains its unique position at the right rear, where it is driven by spiral gear from the timer shaft. It delivers the water through a tapered manifold to the base of the water jackets.

Transmission Improvement.—Carried within a recess in the flywheel is the new three-disc clutch, used for the first time, and which operates in oil. The middle disc contains cork inserts and connects with the transmission through its shaft; whereas the two outside discs attach to the flywheel. In the model O car the three-speed selective gearset is employed. Both shafts are carried on ball bearings, with a double ball race at the end of each shaft, one acting as a thrust bearing and one a radial bearing. In this model, as previously stated, the gearbox and cover are bolted to the rear end of the engine bed and are removable by withdrawing the connecting bolts; but, in addition to this, the gears and shafts may be removed without disturbing the gearbox or any other part of the power plant. The gearbox casting carries an extension enclosing the shifting rods for the speed changes.



The 38-Horsepower Knox Model O Touring Car.

Running Gear.—This model has a tubular front axle, with tierod located in rear of it; the steering knuckles are forgings, with heavy yokes. Hyatt roller bearings are employed in the rear axle, with ball races for taking the end thrust and two annular bearings for supporting the pinion shaft at the rear end of the propeller shaft. The steering gear is of the screw and nut type, the screw formed integral with the column and cut from a solid bar. Both sets of brakes are carried on the rear wheels, the emergencies expanding and the foot set contracting. Asbestos fibre is the friction material. Semi-elliptic springs are used throughout, the rear set being shackled at both ends. In connection with this double shackling is the employment of radius rods and the elimination of the torsion rod, the car being driven through the radius rods only. Thirty-four by 4-in. tires are used, the wheelbase measures 114 inches, and the weight approximates 2,850 pounds with equipment and five-passenger body. Model O is made in touring car, limousine, baby tonneau and sportabout.



Model O Power Plant, with Magneto, Pump and Timer.

The Model M Car.—The Model M car, with seven-passenger capacity, has a 50-horsepower motor, with 5¾-inch bore and 5½-inch stroke. Attention has already been invited to its one-piece crankcase. It employs the three-disk clutch, but uses a Mercedes type selective transmission, with four forward variations, and employs side chain drive. In other respects it is, except for size, a counterpart of the model O car. In touring car lines its wheelbase measures 127 inches, and the tires are 36 by 4½ and 5 inch. Like the model O car, it is manufactured in limousine and sportabout styles as well as touring car, and landaulette.

THIRD DIVIDEND IN POPE RECEIVERSHIP.

HARTFORD, CONN., Sept. 21.—Vice-Chancellor Howell, of Newark, to-day signed an order directing the receivers of the Pope Manufacturing Company to take such steps as may be necessary to secure the transfer of sufficient funds for the payment of a third dividend of 25 per cent. on the approved claims. There was pending an order obtained by Percy S. Bryant, of Hartford, as counsel for a creditor's committee representing claims originally in excess of one million dollars, directing the receivers to show cause to-day why they should not be compelled to pay a third dividend. Vice-Chancellor Howell also signed an order barring certain creditors from appealing from the decision disallowing their respective claims. The order was made pursuant to an order signed July 28, limiting the time of appeal.

LEGISLATION THE WAR CRY OF THE CLUBS

PENNSYLVANIA CLUBS CONSIDER NEW LAWS.

PHILADELPHIA, Sept. 21.—President Joseph H. Weeks, of the Automobile Association of Delaware County, Pa., has prepared three new laws which will be presented to the legislature when the next session convenes in January, 1909. The first provides for the appointment by the governor of a highway commission of three, who shall determine the location of the State's highways and pass upon all applications for State roads and in the building of roads. This measure also provides that where main highways of either telford or macadam are built by the State, a preservative binder shall be incorporated in the top layer of stone to prevent the blowing away of the roads in dust almost as soon as they are built.

Mr. Week's second bill proposes that the State shall build and maintain all main highways, and aid townships in constructing and caring for local roads; and his third measure provides that all money received by the State from automobile licenses shall be used for placing preservative substances on State-aid roads that are built entirely of stone, or shall be built hereafter.

S. Boyer Davis, of the legislative committee, of the Automobile Club of Philadelphia, will submit a measure providing for an increase in the automobile license fee. This measure, if it becomes a law, will, it is figured out, bring the State at least $150,000 from licenses.

To interest legislators in these various measures a committee will be appointed to circulate petitions throughout the State. These petitions will be addressed to the Senate and House of Representatives of Pennsylvania, and it is expected that upwards of 12,000 of them will be filed at the State capital.

WEST VIRGINIA MEET POSTPONED.

WHEELING, W. Va., Sept. 21.—The long-continued dry weather has made automobiling in this State such a hardship on account of the dust and general condition of the roads that the plans of many owners have been upset. In fact things have grown so bad that the annual State meet of the West Virginia Automobile Association, which was scheduled for this city during the past week, was called off. A club run to Columbus, Ohio, over the old National road had to be abandoned for the same reason, as the route selected was reported in very bad shape. There is possibility that the State meet may be held later in the fall when the roads will be in better shape, but it is probable that it will be postponed until spring.

OHIO CLUB WILL HAVE A DAY OF IT.

UHRICHSVILLE, Ohio, Sept. 19.—At a meeting of the Twin City Automobile Club, held last evening, it was decided to hold an "Automobile Day" on September 25. The forenoon has been set aside for the parade of decorated cars in which it is expected fully 100 machines will take part. In the afternoon a hill climb is scheduled, and from present enthusiasm nearly 40 cars will compete. As this is the first event of its kind in Tuscarawas county, all automobilists are planning for a gala day.

NASHVILLE AUTOISTS TO HELP CITY OFFICIALS.

NASHVILLE, TENN., Sept. 21.—Thirty of the most prominent business men in Nashville have decided that it is for their own, as well as the city's interests, that as automobile owners, they have an organiation which can work with the city officials. To this end a club was formed last week under the auspicies of the American Automobile Association, and its main object at present will be the restraint of all automobile owners in the city from violation of the State and city laws.

BALTIMOREANS WANT LAWS AND ROADS.

BALTIMORE, MD., Sept. 21.—A number of important matters were considered by the members of the Automobile Club of Maryland at the first weekly meeting the past week. First of all the dues of active members were raised from $10 to $20 annually. Associate members' rates will remain unchanged. By this means the club expects to increase its work in regard to pushing the good roads movement within the State, while it also desires to secure fair automobile laws and see to it that these are properly recognized by autoists throughout the city and State. Whether a custodian will be engaged to look after the club headquarters and the several bureaus proposed to be established under him will be decided at the next meeting.

A touring contest is looked forward to by the members, and Dr. H. M. Rowe was selected as chairman of a committee to make the necessary arrangements. President James S. Reese stated that the election of officers for the year will be held October 13, while the first meeting of the whist section of the club will take place the first Friday in October. At the conclusion of the meeting the president entertained the members at luncheon.

ROCHESTER CLUB IN NEW QUARTERS.

ROCHESTER, N. Y., Sept. 21.—The Rochester Automobile Club has just moved into its new quarters in the recently opened Hotel Seneca on Clinton Avenue Square. This new hotel, which is one of the finest in the State, will be an ideal location for the club, whose membership now numbers 525. The Board of Governors extends a most cordial invitation to members of other clubs, who may be passing through the city, to visit the new quarters, where they are not only welcome to the use of the club comforts, but they will probably find posted on the various bulletin boards useful information concerning late road conditions, police traps, etc. At present the club is warning all members of the following speed traps:

On the Summerville road near the toll house.
On the Buffalo road between Coldwater and the barge canal.
Between Cayuga and Auburn and near Camillus.

WHAT ONE PENNSYLVANIA CLUB IS DOING.

LANCASTER, Pa., Sept. 21.—In its efforts to secure good roads in Lancaster county, on the direct route from Philadelphia to Pittsburg, the Lancaster Automobile Club, at its September meeting, decided to allow its solicitor to select a man from the club for each township in the county whose duty it shall be to report to the solicitor all cases of violations of acts of assembly relating to the public highways. Particular attention will be devoted in October to the non-removal of loose stones from the roads and the neglect of road supervisors to erect at all intersections of public roads handboards legibly inscribed. The solicitor has sent to each constable and supervisor in the county a circular letter calling their attention to the law on these two subjects and advising them that these laws are in force and will hereafter be enforced. Constables are notified that if they fail to report any neglect of these prescribed duties their return will be challenged at the November term of court and objections filed against the allowance to him of any costs or mileage. In addition, measures will be taken against him for a false return and neglect of duty.

The members of the club are unanimously enthusiastic to give their solicitor their heartiest co-operation. This procedure of the club is being carried out to put the burden of responsibility for poor roads where it belongs—on the road supervisors and the constables.

In the interest of good roads the club also approved the proposition of Chairman Weeks, of the Pennsylvania Motor Federation,

for the appropriation by the State of $5,000,000 for the improvement of the highways.

The September meeting of the club was held at Lititz, and was preceded by a banquet. In connection with each monthly meeting of the club there is a banquet and the attendance always is large. The October meeting will be held at Ephrata.

For one of the younger clubs it is one of the most vigorous in the State. Through its efforts much has been accomplished to secure better roads in that section over which it has jurisdiction. The membership now is near the 200 mark.

HARTFORD MAY HAVE A 24-HOUR.

HARTFORD, Conn., Sept. 21.—There is a movement on foot to kill the forthcoming hill climb of the Automobile Club of Hartford over the Avon Mountain course and substitute therefor, a 24-hour race at Charter Oak Trotting Park. The contest committee of the local organization had practically decided to hold the hill climb on November 7th over the mountain course. The chief cause of the present agitation may be said to emanate in the success of the Brighton Beach 24-hour race. Charter Oak Park, where it is proposed to hold the local event, is at present in first-class condition and as the trotting season terminated in the recent grand circuit trotting meet, the speeding motor cars would work no material harm, as the track is soon to be fixed over. A. J. Welch, one of the owners of the park, is much in favor of the scheme, and has given assurances that the park could be secured. Such an event would be the initial attempt for the local club and it is proposed to have the meet for stock cars only. The dates proposed are Oct. 16 and 17, and it is the intention to start the cars at 4 o'clock in the afternoon, continuing until 2 o'clock the next day, leaving a lapse of two hours during which other motor car events would be run off, and then the final of the 24-hour grind would be resumed at 4 o'clock and would terminate at 6 o'clock.

SPEECHMAKING ON CLEVELAND RUN.

CLEVELAND, Sept. 21.—Interesting the farmers in a three day reliability contest, and convincing them that they should be more friendly toward the automobile, that is the task which the Cleveland Automobile Club has set itself, and during the coming reliability contect, October 14, 15, and 16, a most novel and unique plan will be pursued.

At every small town through which the cars are to pass a stop will be made of ten or fifteen minutes, and while the machines group together addresses will be made to the farmers by prominent Clevelanders who have already volunteered their services for this purpose. Some days before the contest the local club plans to advertise in the small country newspapers the fact that the contest is scheduled for their town and that a stop will be made of several minutes to allow inspection of the cars. This, it is thought, will attract a large part of the rural community, and short speeches will be made to the gathered crowd, after which "all will have an opportunity to inspect the dust covered machines which have traveled so many miles since daybreak—the chance of a lifetime to see real automobiles in a heart straining and nerve racking contest, my friends."

ASA GODDARD AGAIN AT HIS OLD JOB.

CLEVELAND, Sept. 23.—Once more the genial Asa Goddard is back in his old haunts again. When Goddard resigned from the secretaryship of the Cleveland Automobile Club some time ago, to accept the position of chief engineer of the Wadsworth Stone Co. of Pittsburg it was thought that he was done with this city for good and all.

But now he is back again, finishing the work of constructing the new Euclid road being built by the Automobile Club. He has charge of the laying of the final layers, and of smoothing up the rough portions of the work. Goddard is the man who suggested this road, and in a measure he is finishing the building of a monument to himself and the Cleveland Automobile Club.

INDIANA'S RUN UNDER GLIDDEN RULES.

INDIANAPOLIS, Ind., Sept. 21.—With a trip over the proposed route by Frank Staley, president of the Indianapolis Automobile Trade Association, and Geo. Weideley, chairman of the technical committee, last week, arrangements are practically completed for the two days' reliability run to be held in Indiana Oct. 1 and 2. The technical committee has decided to use the rules that governed the recent Glidden Tour and entries are now being received. At least 75 entries are expected.

The run will be to French Lick and return, the trip the first day being 131 1-5 miles through Edgewood, Greenwood, Whiteland, Franklin, Amity, Edinburg, Taylorville, Columbus, Azalia, Reddington, Seymour, Brownstown, Vallonia, Plattsburg, Salem, Livonia, Millersburg, Paoli, Braxton Station, West Baden and French Lick.

Returning the route is 122.2 miles long and will go through West Baden, Braxton Station, Paoli, Mitchell, Bedford, Oolitic, Needmore, Harrodsburg, Clear Creek, Bloomington, Ellettsville, Gosport, Whitaker, Paragon, Martinsville, Waverly and Glen Valley.

SOME POINTERS FOR LUBRICATION.

That proper lubrication is the life of the car has been pretty thoroughly drummed into the mind of even the tyro at automobiling. The following "Don'ts," by G. A. Haws, manufacturer of Panhard oil, give some practical pointers that are worth remembering:

1. Don't allow your motor to exhaust clouds of white smoke. Just enough oil is better than too much, and may keep you out of the police station besides.
2. Don't try to make a light oil by mixing a heavy oil with kerosene. Now that cold weather is about to set in, if the oil that you are using does not flow freely, use a lighter grade. Heavy oil thinned with kerosene is a common cause for cylinders carbonizing.
3. Don't assume that your motor is getting the proper amount of oil; make sure by examining the sight-feeds regularly. Starve a motor on oil and it may be seriously damaged even before it begins to show signs of distress by pounding or laboring.
4. Don't imagine that because you ask for a certain brand of oil you will always get it. There is so much substitution in the oil business nowadays that the wise automobilist makes sure that he gets what he asks for.

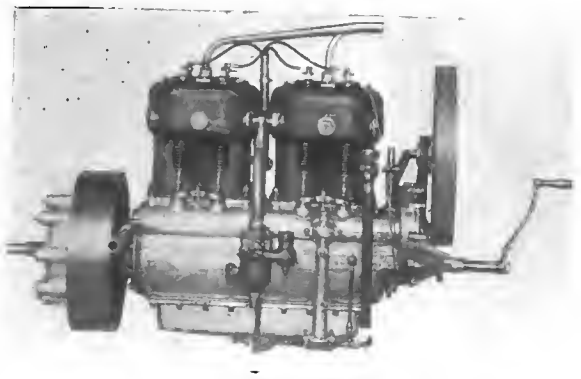
In addition, the steering knuckles and connecting rod, and the hundred and one other small moving parts should be thoroughly oiled. Ten minutes' judicious use of an oil-can every day will save an automobile owner a good many dollars in repairs and replacements at the end of the season.

MATHESON AUTOMOBILE COMPANY.

On September 12 the Matheson Automobile Company, of Wilkes-Barre, Pa., was formed with a cash capital of $150,000, to take over the entire selling end of the Matheson Motor Car Company. This company is an entirely independent organization from the manufacturing concern, which wished to be so situated that it might devote its entire time to the producing end.

At the time the selling company was organized, the manufacturing company simultaneously arranged for a bond issue of $200,000, which has already been disposed of. This means that the Matheson company will have $350,000 additional capital at its command for the manufacture of its 1909 product. To make this coming year even more marked than any before in the history of the company the services of L. C. Kenen as mechanical engineer have been engaged to design and bring out a new car, for besides the chain-driven $5,000 and $5,500 cars, which have heretofore been put on the market, it is proposed to have ready for sale at an early date a shaft-driven model selling for $3,000. The capacity of the plant will be doubled.

Arrangements have been made for desirable salesrooms on Broadway, from which point the selling company will market its cars in Greater New York and distribute throughout the country. G. W. Matheson, president of the manufacturing company, who is at present residing in Wilkes-Barre, Pa., will remove to New York and devote his entire time to the marketing.



Inlet Side of Motor of Marmon Light Touring Car.

WHAT THE MARMON COMPANY WILL FEATURE.

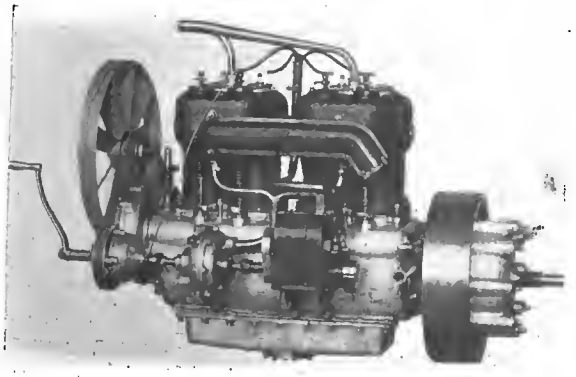
The Nordyke and Marmon Company, of Indianapolis, Ind., is preparing a light touring car of approximately 35 horsepower for the 1909 market. The photographs show the motor from either side.

That at the top of the column shows the carbureter side, and makes plain the method of supporting the motor by means of a cross tube just in front of the flywheel. The oiling connections can also be seen. The oil is forced by a pump driven from the camshaft to the main bearings of the crankshaft; it flows through ducts cut in the journals and crank cheeks to the crank pins, and finally through tubes carried by the connecting rods to the piston pins. This system enables the Marmon Company to set the motor in an inclined position and so secure a straight-line drive. The clearance may also be increased beyond the usual limit.

The lower photograph, showing the exhaust side, gives a good idea of the neatness of the design. The arrangement of the pump and the double-system Remy magneto seem particularly workmanlike.

Glens Falls, N. Y.—The Glens Falls Automobile Company has recently taken possession of the new garage which it erected on Glenn street. The building is three stories high with elevator facilities. A modern repair shop has been installed to handle local and transient trade. This company has for its officers E. F. Irish, president and secretary; W. I. Griffing, vice-president; W. L. R. Durkee, treasurer.

Harrisburg, Pa.—The Ideal Garage & Motor Car Company has opened an establishment at 906-8 Market street, with George F. Snyder as manager. The building has been remodeled and satisfies every condition of a first-class garage.



Exhaust Side of Marmon Motor, Showing Magneto.

PITTSBURG-PHILADELPHIA, 14 HOURS.

Not satisfied with having broken the automobile record between Pittsburg and Philadelphia twice this summer, S. D. Waldon, sales manager of the Packard Motor Car Company, last week went after this mountain road record again and succeeded in lowering it to the remarkable time of 14 hours 1 minute. Mr. Waldon drove the same 1909 Packard "Thirty" which he had used on his previous trips, and as usual was accompanied by four passengers, making a total load of five in the car. The passengers were W. W. Bennett and W. N. Murray of Pittsburg, and F. C. Graves and L. R. Mack of Boston. The schedule:

Miles	Place.	Clock Time.	Elapsed Time.
0.	Pittsburg	3:45	0:00—A
32.2	Greensburg	4:55	1:10
51.2	Ligonier	5:50	2:05
70.7	Stoyestown	7:05	3:20
76.8	Buckstown	7:28	3:43
90.2	Schellsburg	8:09	4:24
99.7	Bedford	8:25	4:50
107.7	Everett	8:57	5:12—B
134.2	McConnellsburg	10:23	6:38—C
142.4	Ft. Loudon	10:58	7:13
156.3	Chambersburg	11:32	7:47
180.7	**Gettysburg**	12:33	8:48
209.6	York	1:56	10:11
222.4	Columbia	2:30	10:45
233.9	Lancaster	2:57	11:12
260.6	Coatesville	4:08	12:23
266.9	Downington	4:20	12:35
294.3	City Line	5:26	13:41
302.4	Philadelphia	5:46	14:01

Only Stops.—(A) blocked railway crossing, 2 minutes; (B) for coffee, 3 minutes; (C) for gasoline, 7 minutes.

S. D. Waldon and Cross-Pennsylvania Party.

AN AMERICAN MANUFACTURER ABROAD.

Thomas B. Jeffery, whose long experience makes him a dean in the automobile industry of America, and whose name has been connected with the word Rambler for over twenty-eight years, has just returned from a three months' tour through Scotland, England and Germany, where he took the opportunity of investigating some of the manufacturing methods of foreign countries. The most striking feature to him was the fact that almost no attempt was made there to build a machine at what we consider a popular price. The machines are heavy and only those with a large income can afford to own one. He decided that the cost of production was high, largely because of the comparatively small number built, and the fact that the real manufacture of the car was distributed among a variety of concerns, the machine itself being little more than an assembled car.

An interesting thing happened during his tour of England which illustrates how useless a car from that country would be in America. The Rambler builder in making his little local trips hired various cars of various makes and while passing along the road one day while in England, he noticed a tin mine a short distance from the road, which could only be reached by going over a rather rough road. On his requesting the driver to turn in so that he might inspect the mine, he was informed that to go up that road would tear the under portion of the car to pieces, because the rocks in the road were too high.

Testing Out the Chalmers-Detroit on the Famous Grosse Pointe Track, Detroit.

Race Track as Testing Ground.—Since the Chalmers-Detroit Motor Company has begun to make deliveries of the new "30" model, they have had so many cars out for testing purposes that it became necessary to procure some place where a large number of machines could be tested out at high speed. After some negotiation with the track raeing committee of the famous Grosse Pointe traek, permission was obtained for the use of this mile circuit for testing out of ears. As it is only a short distance from the factory it is very convenient and every day fifteen to twenty machines are given a long track test in addition to the road test.

A Strenuous Pope-Hartford Trip.—Rather a strenuous flying test trip was recently completed by W. C. Walker, seeretary of the Pope Mfg. Co., Assistant Superintendent Seymour, James Grady, the well-known driver, and Mechanie Houston. They left the Hartford Club at 1 P.M., and passed through Providence and Boston to Newburyport, where they spent the night. Early the next morning they were on the road again and continued on to Portsmouth; then striking inland, they made a circuit round Lake Winnipesaukee and returned through Worcester and Springfield to Hartford. In all they covered 600 miles in a day and a half.

National Battery Co. Affairs.—Announcement is made by the National Battery Company, of Buffalo, that the receivership under which the company has been working for the past eight months was terminated August 19, and the entire property has been restored to the stockholders. Full control of the reorganized company has been secured by the Cutler-Hammer Manufacturing Company, of Milwaukee, well known as makers of battery charging rheostats and other electrical controlling devices. The plant of the company will remain at Buffalo, but the business will be conducted under new management.

Greatest Industry in Syraeuse.—The H. H. Franklin Manufacturing Company objected to the statement made in a Syracuse paper that the greatest single industry in Syracuse is the manufacture of clothing. The clothing concerns did a $3,000,000 business last year, but the Franklin company beat that figure by a million. This is for the year ending September 1. J. E. Walker, of the big automobile eoncern, says that in the last seven years over 6,000 machines have been built at the factory. In 1902, when the concern was organized, thirteen runabouts were built, the total value heing $15,600, and thirteen men were employed at the work. The payroll now contains the names of 1,500 men. Next year the concern expeets to add to its output a number of commercial vehicles and motor cabs.

A. L. A. M. and Standard Rims.—When seen regarding the report that the Licensed Association had decided upon the adoption of a certain form of quick detachable rim, Albert L. Pope, chairman of the tire committee of the association, said: "It is hardly to be expected that the Licensed Association as a body, with the far-reaching influence that its actions necessarily have, would take precipitate action. They have not as yet taken any action, specifically adopting any particular type of quick-detachable rim."

Another New Car Coming.—The announcement eomes from Muncie, Ind., that a new factory for the manufacture of automobiles will be started in this place as soon as the title to the site for the plant can be obtained. The project is being financed by Thomas F. Hart and Madison Maring, of this city, and outside interests. Although no definite details have been given out, it is understood that they have obtained the rights on a car which has been successfully marketed for a number of years.

Stoddard-Dayton Wins Three.—At San Francisco last Saturday, in the nresence of 20,000 people, a Model K Stoddard-Dayton, which sells for $2,500, won three events on the program, going out of its class in two of them. This machine won in the event open to ears costing $2 000 to $3,000 for 10 miles, also the race open to those costing $3,000 to $4,000 for the same distance, and the free-for-all against a field of six machines.

New Swinehart Buggy Tire.—To meet the demand for a special autobuggy tire the Swinehart Rubber Company has put on the market a tire of its regular clincher design in sizes adapted to these cars. It is made larger than the ordinary carriage tire, of specially compounded and cured rubber, which gives it greater resiliency, and the grooved side design permits a wider tread, affording better traction in mud and sand.

New Home of Invader Oil.—During Founders' Week at Philadelphia, Charles F. Kellom & Co., manufacturers of "Invader" oils, will be at home in their new location, 113 Arch street. The building has been entirely remodeled both inside and outside, and affords much better accommodation for the increasing needs of the business than the old quarters further up the street.

Visiting the Franklin Plant.—Henceforth the many visitors at the H. H. Franklin Manufacturing Company's factory in Syracuse, N. Y., will be given a personally conducted tour by experienced guides, who will explain in detail how the Franklin car is constructed. Many of the principal parts will be shown to illustrate how systematically the manufacture is carried on and how carefully every piece is inspected and tested.

The Other Side of the Story.—The Winton Motor Carriage Company has in press a booklet explaining their views on the light weight question. Although admitting every argument put forward in favor of light cars, they believe that the advantages of heavy weight cars are more important. The book is well illustrated and will be ready for distribution within a week.

Mora Company Election.—Last week, at the annual stoekholders' meeting of the Mora Motor Car Company in Newark, N. Y., the following officers were elected for the coming year: S. H. Mora, president; T. W. Martin, viee-president, and W. N. Freeman, secretary and treasurer. A resolution was passed reducing the number of directors from seven to five.

E. M. F. Cars in New York.—H. J. Koehler, the New York agent of the Everitt-Metzger-Flanders Company, has just returned from a trip to the factory in Detroit. He has contracted for 1,000 E. M. F. cars for distribution in his territory, which includes New York City with ten adjoining counties and the State of New Jersey.

Cleaning Up the Dietzmans.—The United States Circuit Court has notified Joseph Harris, as trustee for the bankrupt Dietzman Shock Ahsorher Company, to dispose of 150 sets of these absorbers as soon as possible. This constitutes the remainder of the stoek on hand in the possession of the trustee.

Densmore Company of Buffalo.—A new firm, to be known as the Densmore Company, has just heen incorporated in Buffalo with a capital stock of $15,000 and will deal in automobiles. The incorporators are W. R. Densmore, of Buffalo, and Fred Densmore and F. Sturtevant, of Erie, Pa.

Tires for the Roval Car.—The Continental Caoutchouc Company has been informed by their home office that His Majesty, the Emperor of Austria, will be presented with two automobiles, both equipped with Continental tires, to commemorate the sixtieth year of his reign.

Shock Absorbers at Brighton.—Cars equipped with Truffault-Hartford shock absorbers took first, second and third places in the 24-hour race on the Brighton Beach track last Saturday. The winning Lozier used them for the first time, although it has competed in many other contests.

Atlanta to Have Taxieabs.—Capitalists of Atlanta, Ga., exoect to shortly incorporate the Atlanta Taxicab Company, with a capital stock of $12.000, to operate cabs on the city streets. Ten machines will be purchased to begin with.

Grand Central Palace Show Poster.

One of the most artistic show posters ever brought out is the one-half sheet lithograph of the A. M. C. M. A., under whose management the Ninth International Automobile Show will open New Year's Eve in Grand Central Palace. Eight different colors have been embodied in the scheme. It is arranged so that no printing is placed on the pictorial part, which can be cut out and framed.

IN AND ABOUT THE AGENCIES.

Pennsylvania.—The Pennsylvania Auto Motor Company announces that it has just concluded arrangements with J. M. Quinby & Co., carriage builders, of Newark, N. J., to distribute Pennsylvania cars in northern New Jersey, New York City and vicinity. The Quinby company will open a large showroom in New York and will handle the Isotta also. A specialty will be made of furnishing Pennsylvania cars with special Quinby bodies.

Mitchell.—Having outgrown its present quarters at 236 North Broad street, Philadelphia, the Penn Motor Car Company has secured a lease on the three-story building at the northwest corner of Broad and Cherry streets, and after necessary alterations will move into its new quarters, possibly about October 1. Manager Walter Cram says his company has contracted to dispose of at least 300 Mitchells during the next twelve months.

Jackson.—The Jackson Motor Car Company of Philadelphia has been organized to look after the interests of the Jackson car in the Quaker City. Quarters have been secured with Prescott Adamson, at the northwest corner of Broad and Spring Garden streets, where the Columbia and Renault are also handled.

New Packard Quarters.—The Packard Motor Car Company of New York has leased the Osborne Realty Company's store at Brantford and Treat place, Newark, N. J., for their branch in that city.

New Tire Concern.—The W. D. Spring Cushion Tire Company of Philadelphia has filed articles of incorporation with a capital stock of $250,000 and will manufacture tires for all kinds of vehicles.

Studebaker.—John A. Bersenger, builder and dealer in carriages and owner of an automobile repair shop in Huntington, N. Y., has taken the agency of the Studebaker for 1909.

Pierce Arrow.—Henceforth the Ellis Motor Car Company, agents for the Pierce Arrow in New Jersey, will be located at 124-126 Washington street, Newark, N. J.

PERSONAL TRADE MENTION.

Wagner-Field Company.—Fred J. Wagner, until recently with *Motor Age*, and Russell A. Field, late auto editor of the Brooklyn *Daily Eagle*, have established an advertising service in the Thoroughfare Building, 1777 Broadway, New York City, under the name of the Wagner-Field Company. The motor car and interests allied with its sale and manufacture will be made a specialty.

George M. Davis has been placed in charge of the George N. Pierce Company's publicity department. Mr. Davis is generally recognized among the most efficient press agents connected with the automobile industry. He formerly occupied that position with the E. R. Thomas Motor Co.

J. E. Doane, for the past two years Syracuse representative of the H. H. Franklin Manufacturing Company has added to his field of activity that part of New York State east of Rochester to the Hudson River.

C. E. Apgar, formerly in the employ of the New York branch of the Franklin Automobile Company, has resigned from that concern, and joined the New York force of the Haynes Automobile Co.

G. A. Winslow, who has been for nine years past with the Boston Cycle & Sundry Company, Boston, Mass., has joined the forces of the Boston branch of the Pennsylvania Rubber Company.

F. F. Neaver, who for a number of years has been sales manager for the Studebaker Brothers Mfg. Co., is going to take charge of that company's branch at Portland, Ore.

Carl J. Simons has resigned as manager of the Palace Auto Company of Kansas City, Mo., and will become manager of the Maxwell-Briscoe branch October 1.

C. F. Stimson, formerly of Kansas City, Mo., is to be appointed manager of the new branch of the Maxwell-Briscoe Company in Minneapolis.

H. D. Benner, recently appointed Philadelphia agent for Michelin tires, will shortly open well-equipped quarters at 320 North Broad street.

DEATH OF VALENTINE B. LANG.

HARTFORD, CONN., Sept. 22.—Valentine B. Lang, vice-president of the Hartford Rubber Works Company, died suddenly at his home in this city this noon. He arrived home this morning from a trip to Columbus, O., but did not complain of feeling ill. After lunch he had an attack of heart trouble, which resulted in his death.

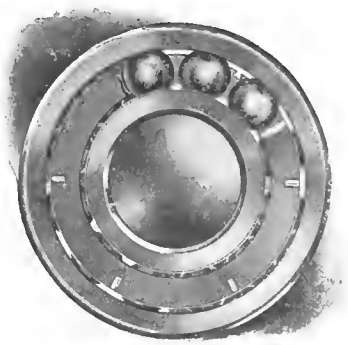
Mr. Lang was born in New York, July 18, 1858. Twenty-five years ago he entered the employ of the West Shore Railroad, as foreman of the machine shop, under the late Charles H. Dale. Mr. Lang next became assistant superintendent of the Chicago & Alton Railroad, and afterwards master mechanic of the C. N. O. & T. P. Railroad, at Chattanooga, Tenn. From there he went to Birmingham, Ala., where he was connected with the Great Southern Railway. From Birmingham he went with Morgan & Wright, and had charge of their new plant at Detroit. Two years ago he came to Hartford as factory manager of the Hartford Rubber Works Company, and in 1907 was promoted to be vice-president. He is survived by his wife. Mr. Lang was a thirty-second degree Mason, and belonged to the Knights Templar Commandery in Detroit.

Branch Managers and Field Representatives, Hartford Rubber Works Company.

Standing, left to right—D. W. Shattuck, G. D. Niles, G. R. Noble, F. J. Kerner, H. E. Field, vice-president; Charles Kenyon, A. D. Cruden, J. J. Tompkins, Charles Clark, D. W. Pinney, E. H. Fahy, F. B. McClunie. Top row, sitting, left to right—Charles Langmaid, George Orr, W. T. Powell, W. H. Reed, W. R. Barnes, H. C. Severance, H. F. Snyder, E. S. Roe, Second row, sitting left to right—H. Barth, Jr., E. W. Culver, E. H. Johansen, J. P. Krogh, A. L. Lowe, W. H. Bell, P. H. Goodall. Lower row, sitting, left to right—H. B. McIntosh, W. Brown, M. C. Stokes, H. E. Smith, R. H. Gillies, J. D. Anderson, president; H. Plow, treasurer; F. Kesser, A. W. Kirk.

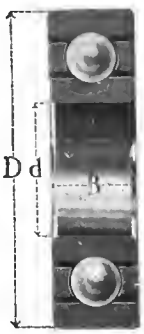
INFORMATION FOR AUTO USERS

New Annular Ball Bearing.—A new type of "silent" annular ball bearing which possesses some special advantage over preceding types is shown in the accompanying illustration. This new bearing is made by Fichtel & Sachs, of Schweinfurt, Germany,

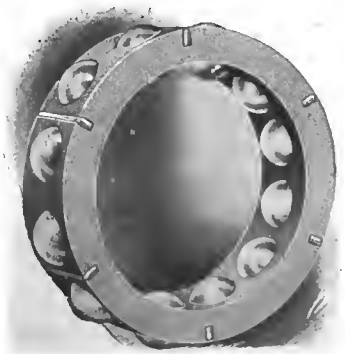


VIEW SHOWING BALLS EXPOSED.

and it resembles former ball bearings made by that well-known firm in respect to the method of introducing the balls. This method, as users of these bearings know, is to form angular entering grooves in the sides of the inner and outer races, and after the bearing is half filled to introduce the remaining balls by way of these grooves. Contrary to a possibly common impression, these side grooves are not quite as deep as the races themselves and therefore the balls are sprung in under some pressure. Once in they do not touch the side grooves, and even if they did the fact that the grooves are angular would prevent them from tending to escape. So far as the ball "knows" the side grooves are no longer there. This construction presents obvious advantages over that in which the races are so shallow that the balls may be sprung in from any point, since such races are usually too springy to endure material



CROSS SECTION VIEW.



F. & S. BALL-CARRYING CAGE.

end loads, whereas bearings constructed in the manner above described will carry end loads from 1-10 to 1-4 of their radial load capacity. It also permits a larger number of balls to be used than when, as a bearing, without side grooves, only half the races are filled with balls. In the new type of bearing the distinctive feature is the separator, which is so formed as to permit almost the entire space to be filled with balls. The separator is die-cast of a special alloy and requires almost no machining. It is split in the central plane of the balls, and the two halves are united by brass wires or dovetail section, which are inserted in dovetail-shaped grooves and have their ends clinched over into notches in the sides of the separator. From the illustration it is seen that the loss as compared with the "full" type is only one ball. The makers of this bearing lay special stress on the high quality of the materials used and on the extreme accuracy of workmanship and sizing. It is obvious that a bearing such as the one described, having more than the usual number of balls, should distribute its load among several balls instead of concentrating it on three or two, or even on a single ball. To realize this, extreme accuracy in both balls and races as well as perfect uniformity in size of balls is necessary. Fichtel & Sachs claim to have made this degree of accuracy a matter of commercial practice. These bearings are imported by J. S. Bretz Company, Times Building, New York City.

Motorlube Oils.—"Perfect automobile lubrication means the reduction of carbon without materially reducing the lubricating qualities of a pure Pennsylvania petroleum. A few years ago it was thought a heavy viscous oil would give better lubrication than the so-called light oil, which is not true," says B. S. Mellor, manager of the E. A. Tygert Company, makers of motorlube oil, 614 Chestnut street, Philadelphia, Pa. "The viscosity of a very heavy oil is very great at low temperature, but the very high temperature of the cylinders must be considered. Below are some relative viscosity tests of heavy and light oil:

	70 F.	140 F.	200 F.	300 F.	400 F.
Heavy	3100 sec.	253 sec.	75 sec.	40 sec.	21 sec.
Light	1270 sec.	135 sec.	52 sec.	35 sec.	20½ sec.

The above tests go to show that at 400 degrees F. the light oil has practically the same viscosity as the heavy. It is well known that a light colored highly filtered oil has less carbon than the heavy loaded dark colored oils, and it is my opinion that a light oil of sufficient viscosity is better in all respects for automobile lubrication than a heavy oil."

New Feature on Speedometer.—One of the features of the new Peerless Speedometer, which has just been placed on the market by the Peerless Specialty Company, 1876 Broadway, New York City, is that the season's mileage cannot be altered except by sending the instrument back to the factory, thus making it impossible for any one to run a machine with one of these instruments attached without the owner's knowledge.

The Utility of "Permanit."—In the issue of THE AUTOMOBILE for September the statement was made that "Permanit," manufactured by Adolph Karl & Company, of Newark, N. J., would prevent blowouts. From the nature of the substance this is manifestly impossible, but the manufacturers do assert that it will neutralize the effects of punctures by immediately healing them through chemical action.

"Oilzum."—The White & Bagley Company, Worcester, Mass., has recently put out a little device which will undoubtedly prove very convenient to a great many auto users. This appurtenance consists of a bracket, as shown in the illustration, for holding a can of oil on the running board. The lower end of the bracket projects under the running board and is fastened by two brass screws, so that the top of the board is not marred, and the bracket may be put in place or removed on a moment's

WHITE & BAGLEY DEVICE FOR CARRYING CAN OF OIL.

notice. By attaching another bracket to the back of the running board, two cans may be carried, the strap being brought clear over the two cans. Many tourists have found that at times it is convenient to have a good supply of oil on hand, but have sometimes found difficulty in carrying it handily. This arrangement should help them out, and the manufacturers will furnish these brackets free of charge to all users of their carbonless cylinder oil.

Improved Methods in Lens Mirror Manufacture.—The problem of manufacturing a permanent silvered surface for the reflectors of the acetylene lamp has baffled the producers from the first. The common opinion has been that the difficulty was in the proper silvering of the mirror, but Stevens & Co., Providence, R. I., manufacturers of the thermo mirror reflectors, claim to have discovered that the trouble comes, not from poor silvering, but from the fact that because of the difference in material of the backing unequal expansion took place between the glass and these materials. When this took place the perfect contact between the glass and the silver was disturbed, allowing moisture to creep in, which caused oxidization and the consequent loss of the reflecting power. To remedy this Stevens & Co. have produced a combination of backing materials which, when applied upon the surface of a lens mirror, they maintain will expand and contract in unison, insuring perfect contact under all conditions between silver and glass.

Nine Lives.—The Empire Automobile Tire Company, of Trenton, N. J., is sending to its friends in the trade a poster in colors showing a pussy cat with a blue bow on its neck sitting in the middle of a 36x4 Empire clincher tire. The implication is, of course, that the tire, like the pussy, has nine lives.

Vol. XIX New York—Thursday, October 1, 1908—Chicago No. 14

THE AUTOMOBILE

NEW ENGLANDERS HAVE REAL 24-HOUR STRUGGLE

Franklin Which Carried No. 13.

BOSTON, Sept. 30.—There have been Glidden tours that needed several days and many miles of added driving to eliminate the winners from big fields of starters, but no endurance run of the one-day type has ever required so gruelling a postscript of road plugging to evolve a winner as has that of the Bay State Automobile Association, which started last week Wednesday night, September 23.

Nine of the 21 cars evolved with perfect scores in the original run from Boston to Bretton Woods and return, which started Wednesday night at 10 o'clock and concluded the following evening with the contestants having been on the road 22 hours and 15 minutes for the 386-mile journey, though some of the cars covered more than 400 miles by going astray.

These were the perfect score cars: Franklin, Studebaker, Marmon, Oldsmobile, two Shawmuts, Reo, Buick, and Lancia. The clean-score cars were immediately locked up in the White Garage and the drivers and entrants notified to meet Friday at 2 P.M. at the Bay State clubhouse. It was then decided that the battle would be continued to a finish. Two contenders then withdrew.

Shawmut Runabout, Church Driving.

Tied Cars Reduced to Four in Number.—Boston, Sept. 26.—While the winner was decided in the first day's run-off, which was accomplished partially in a fog, only four finished the day without a mark, these being the Franklin, Studebaker, Marmon, and the Shawmut runabout. The unfortunates were Lancia, Oldsmobile, and Shawmut tourer, all of them meeting with mishaps.

One Out on the Second Run-off.—Boston, Sept. 28.—In the second run-off from Boston to Portland and return, 240 miles, F. E. Wing's Marmon lost a wheel in a ditch near Wells. The Studebaker, Franklin, and Shawmut have covered 958 miles.

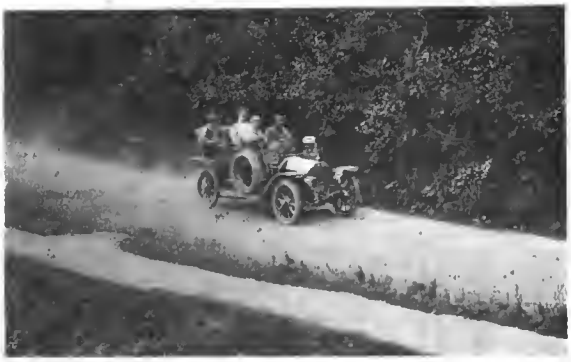
Studebaker, W. G. Jones Driving.

None Out on Third Day Continuation.—Intervale, N. H., Sept. 29.—Without mishap of any kind, the Franklin, Studebaker, and Shawmut tied trio arrived here to-night via Portland, Poland Springs and Fryburg. According to the drivers, the day's run was the hardest thus far.

The cars are scheduled to leave here at 6 o'clock Wednesday morning for Boston via Crawford Notch, Bretton Woods, Bethlehem, Franconia Notch and Concord. They should finish about 7 p. m.

The original plan was to hold a twenty-four-hour test over the roads from Boston to Bretton Woods, in the White Mountains, and return, and to give the clean score cars certificates of merit. Then a member of the association offered a $200 cup to be awarded to the winning car, and this made it necessary that a winner be determined. To this end it required that the test be definitely

Marmon, with Wing at the Wheel.



Oldsmobile Touring Car, Driven by Hobson and Schneider.

continued until but one clean score car should survive. The run started at 10 o'clock Wednesday evening from the Bay State Automobile Association. Of the twenty-two cars that had been entered, twenty-one showed up for the send-off. They were:

Touring Cars.

No.	Car.	Entered By.	Drivers.
1.	Pierce	Harry Knights	Harry Knights.
2.	Marmon	F. E. Wing	F. E. Wing.
4.	Lancia	Hol-Tan Co.	W. M. Hilliard.
6.	Buick	Buick Motor Co.	W. L. McCain.
7.	Shawmut	Shawmut Motor Co.	Arthur Ayres.
13.	Franklin	Franklin Auto Co.	Carris and Burns.
14.	Studebaker	Studebaker Auto Co.	W. G. Jones.
15.	Cadillac	A. T. Fuller.	H. L. Smith.
16.	Oldsmobile	Algonquin Motor Car Co.	Hobson and Schneider
19.	Stevens-Duryea	J. W. Bowman Co.	G. Canterbury.

Runabouts.

No.	Car.	Entered By.	Drivers.
3.	Buick	A. H. Waitt.	A. H. Waitt.
5.	Lancia	Hol-Tan Co.	Harry Fosdick.
8.	Shawmut	Shawmut Motor Co.	Harold Church.
9.	Overland	Frank Wentworth	Frank Wentworth
10.	Overland	Frank Wentworth	H. Dorr.
11.	Chalmers-Detroit.	Whitten-Gilmore Co.	Oliver Light.
12.	Rambler	T. F. Jeffery & Co.	E. W. Williams.
17.	Corbin	Corbin Motor Co.	S. T. Goss.
18.	Overland	Mrs. Mabel Stearns.	Mrs. Mabel Stearns.
22.	Buick	Buick Motor Co.	C. H. Coakley.
23.	Reo	J. M. Linscott Co.	Fred Pratt.

The confetti car was a Knox, and the official cars were a Stevens-Duryea and a Royal Tourist. Each competing car carried an observer, and there were checking stations at Rochester, 90 miles from Boston; Bretton Woods, 182 miles; Concord, 283 miles, and Boston, 359 miles. At Bretton Woods an hour and a half stop for luncheon was made, and it was permitted that the motors be stopped. The time of arrival of the first car in Boston was 8:45 P. M.

Of the 21 starters, 15 finished, and 9 of these had perfect scores. The successful cars were the Marmon, Shawmut, Franklin, Studebaker, and Oldsmobile, in the touring class, and the Lancia, Shawmut, Reo, and Buick in the runabout division. The Franklin was the only air-cooled car in the test and it went through with flying colors. The Lancia engine was sealed, and was not stopped during the entire run. After reaching Boston, Harry Fosdick continued to keep the engine running until it had been in operation for a complete 24 hours.

Lancia Runabout, with Harry Fosdick at the Wheel.

The Pierce car, driven by Harry Knights, was a 1906 type that he had driven previously over 30,000 miles, and it suffered only a two-point penalization. Going up a long hill near the Profile in the White Mountains, the gas tank failed to feed the carbureter because of low pressure, and the engine was stalled for two minutes. The No. 3 Buick lost five points for stalling the engine before the first control was reached, and another point for similar trouble before the second control. It was not reported beyond Bretton Woods. The Lancia, driven by W. M. Hilliard, was tied up nearly an hour on the outward leg by reason of the carbureter becoming clogged with dust. After locating and remedying the trouble, Hilliard struck a cup race gait and landed in Bretton Woods ahead of everybody else. On the way back the engine stalled, costing the car a slight penalty. The No. 6 Buick had a clean score at Bretton Woods, but after passing Plymouth it had the misfortune to get into a mix-up with a skittish horse, and both automobile and horse were put *hors de combat*, the car being unable to finish.

The No. 9 Overland reached Cambridge with a clean score. Then, when only two or three miles from the finish, in turning out of a car track the car skidded and a wheel collapsed. The No. 10 Overland had varied troubles, and finally quit at Bretton Woods, with 31 points against it. The Chalmers-Detroit also was unfortunate. Carbureter trouble cost it 7 points, stalling the engine 7 points, and transmission troubles 82 minutes.

The Rambler had only one point scored against it, the motor being stopped for 25 seconds by dust that clogged the intake valve near Bristol on the return journey. The Cadillac lost 1 point for stalling of the engine, and 21 for being late in Boston. On the way to Boston the driver twice lost the road. While consulting a signboard, the driver of the Corbin accidentally stalled the motor, which cost his car two points. It was stuck in the sand above Concord, and was 17 minutes late at the control. It was also late at Boston. The driver also lost his way.

The only woman in the tour was Mrs. Mabel Stearns, of York Harbor, Me., at the wheel of an Overland. She lost 27 points to Bretton Woods, and was not reported thereafter. The carbureter, a stalled motor, and gas pipe troubles accounted for her bad score. The Stevens-Duryea, after passing the Rochester control, sprung a leak in the gasoline tank, and the gas all disappeared, leaving the car stranded in the woods. After much delay the hole was plugged, and sufficient gasoline was obtained to bring the car back to Boston by the route it had followed on the outward trip.

The official cars had their share of trouble also. The confetti car had magneto trouble near Rochester, and the confetti was taken up by the Stevens-Duryea, which carried it the rest of the way, making all controls on time and having no trouble. The Royal Tourist was often delayed by tire trouble. The roads were very dusty, which interfered with the engines and stung the eyes and faces of the drivers and passengers. Owing to the protracted drought also, the roads were very rough, and the passengers and observers in the rear seats had a hard trip.

The official result of the first day's run was as follows:

No.	Car.	Entered By.	Penalization.
2.	MARMON	F. E. Wing	Perfect.
5.	LANCIA	Hol-Tan Co.	Perfect.
7.	SHAWMUT	Shawmut Motor Co.	Perfect.
8.	SHAWMUT	Shawmut Motor Co.	Perfect.
13.	FRANKLIN	Franklin Auto Co.	Perfect.
14.	STUDEBAKER	Studebaker Auto Co.	Perfect.
16.	OLDSMOBILE	Algonquin Motor Co.	Perfect.
22.	BUICK	Buick Motor Co.	Perfect.
23.	REO	J. M. Linscott Co.	Perfect.
12.	RAMBLER	T. J. Jeffery & Co.	1 point.
1.	PIERCE	Harry Knights	2 points.
15.	CADILLAC	A. T. Fuller.	21 points.
17.	CORBIN	Corbin Motor Co.	25 points.
4.	LANCIA	Hol-Tan Co.	74 points.
11.	CHALMERS-DETROIT	Whitten-Gilmore Co.	96 points.
3.	BUICK	A. H. Waitt.	Did not finish.
6.	BUICK	Buick Motor Co.	Did not finish.
9.	OVERLAND	Frank Wentworth	Did not finish.
10.	OVERLAND	Frank Wentworth	Did not finish.
18.	OVERLAND	Mrs. Mabel Stearns.	Did not finish.
19.	STEVENS-DURYEA	J. W. Bowman Co.	Did not finish.

MILWAUKEE'S "24" WON AGAIN BY LOCOMOBILE

MILWAUKEE, Wis., Sept. 27.—For the second time the Locomobile has won the annual 24-hour Milwaukee track race, a 40-60-horsepower roadster, driven by Bob Drach and Fred Leiser, finishing first in the long grind which was contested Friday and Saturday on the State Fair Grounds track. The Locomobile ran up a total of 992 3-4 miles and led a 20-horsepower Mitchell by a big margin, the Racine machine recording 808 3-4 miles. Third was the White Steamer, with 712, while the Midland was fourth with 693 1-2. The Buick runabout had 519 3-4 miles. Three other cars started—a two-cylinder Jackson, a four-cylinder Maxwell, and a Petrel, the last a new friction-drive production.

Conditions were different from those of last year, for the two-car team proposition was abandoned and instead it was a one-car race. It was a continuous performance, too, there being no intermission for short distance races as was the case at Brighton Beach. Interest in the affair at the start was centered in the Locomobile and the White, this being the first appearance of the later in a 24-hour race.

The Maxwell was an important factor at the start. It jumped into a duel with the big Locomobile and fought every inch of the way for the first 45 minutes. Then it ran into the fence in the backstretch and was down and out with a punctured radiator and a broken flywheel. Then the Mitchell became aggressive, and at the end of the first hour it had the honor of leading the field. The Locomobile then warmed to its work, and at the end of the second hour was on even terms with the Mitchell, finally pulling away, and was never headed thereafter.

Only two accidents marred the race, the Maxwell and the Jackson being the sufferers. The latter went out at 8 o'clock Saturday morning, when it crashed into the fence on the first turn. No one was injured in either accident.

Compliments of all sorts were handed out to the hard-working officials of the Milwaukee Automobile Club for the manner in which they handled the big race. Apparently nothing had been overlooked and there wasn't a hitch from start to finish. Forty-four officials, counting the reliefs, were on duty, with Chairman Dearholt, of the racing board, and Secretary Drought "on the job" from start to finish. The club scored an innovation by securing twenty members of the state militia for guards and well did they do their work, no one but officials or contestants being allowed on the track, while at the paddock passes were necessary in order to get past the dead line.

The arrangements for checking the progress of the race worked perfectly, the milage being recorded by means of street car registers, the same as was done last year. Each car had a register and as it finished a lap an attendant pulled a string, which rang a bell and recorded the mile.

The track and grounds were lighted by Avery gas tanks, there being 150 of them in service. On the track these were placed at about 35-foot intervals, with a common wash basin acting as a reflector. They were so turned that they flashed the light ahead, so that the drivers were not blinded by the light.

Every car in the race was allowed to put on extra gasoline and oil tanks, which technically violated the racing rules as regards stock cars. The Locomobile had its extra tanks on the rear, all of them big brass affairs which made the car resemble a chemical fire engine. The gasoline tank held 22 gallons, and there was a 6-gallon oil tank and two acetylene gas tanks, making a formidable battery. Like all the others two tail lights, fed by acetylene gas, were used. The White steamer just doubled its water and fuel capacity, the first by means of a 6-foot affair which was placed on the running board and looked like an extra-long tool box. In addition there was a gasoline tank on the rear of the chassis, which gave the White a capacity of 40 gallons of water and the same in gasoline. It was this extra equipment that proved the undoing of the steamer. This was the first 24-hour race in which it ever had taken part and its

Fuel Tank Arrangement on the Winning Locomobile.

entrants were not prepared for it. F. W. Gregory of San Francisco entered the car and it was shipped here from Denver, where it had been a contestant in the Labor Day road race. It only got here the day before the race, and there was no chance to try it out. When it did get into the actual race it was discovered that the two extra tanks seriously interfered with the draught system, necessitating frequent stops because of overheating of the burners.

The Mitchell carried a 35-gallon gasoline tank, while the Buick had an extra 5-gallon tank. The Maxwell had 15 gallons "up its sleeve." The Midland carried an extra 10 gallons as well as 5 gallons of oil. The Jackson packed 8 extra gallons of gasoline and 3 gallons of oil.

Fisk demountables were fitted to the Locomobile, Mitchell and White, while the Midland and Buick had Firestones. Goodyears were on the Jackson and Ajax on the Maxwell. The demountables proved great timesavers, fast work being done in changing. As an instance of the speed possible a right front on the Loco was changed in 1 minute 20 seconds.

HOW THE CONTESTANTS PROGRESSED AND FINISHED IN THE MILWAUKEE 24-HOUR RACE.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
LOCOMOBILE	41	87	129	167	212	253	291	333	371	408	458	503	542	571	613	658	700	748	783	826	867	911	952	992¾
		46	42	38	45	41	38	42	38	37	50	45	39	29	42	45	42	48	35	43	41	44	41	40¾
MITCHELL	44	87	117	160	200	200	234	272	308	343	364	405	436	472	501	535	569	604	638	671	708	739	774	808¾
		43	30	43	40	...	34	38	36	35	21	41	31	36	29	34	34	35	34	33	37	31	35	34¾
WHITE STEAMER	35	78	114	139	178	219	255	296	330	367	406	426	449	477	504	515	538	558	577	615	646	652	680	712
		43	36	25	39	41	36	41	34	37	39	20	23	28	27	11	23	20	19	38	31	6	28	32
MIDLAND	30	57	91	117	127	163	197	229	264	295	330	350	381	411	443	469	491	517	543	570	604	631	662	693¾
		27	34	26	10	36	34	32	35	31	35	20	31	30	32	26	22	26	26	27	34	27	31	31¼
BUICK	29	50	70	94	111	129	161	194	226	257	288	315	355	389	438	440	440	440	444	446	446	446	478	519¾
		21	20	24	17	18	32	33	32	31	31	27	40	34	49	2	...	...	4	2	...		32	41¼
JACKSON	26	48	76	112	147	168	185	208	208	214	229	253	262	296	318	350	Out							
		22	28	36	35	21	17	23	...	6	15	24	9	34	22	32								
PETREL	24	59	65	65	85	96	Out																	
		35	6	...	20	11																		
MAXWELL	38	Out																						

CALIFORNIANS HAVE A TRACK MEET.

San Francisco, Sept. 21.—The holding of the second annual track meet of the Olympic Club proved even a greater success, as far as records and enthusisam is concerned, than was the initial event of last year. The races were held on the Tanforan race track Sunday, September 20, and passed off without an accident to mar the sport. Over three thousand persons motored to the track, which is located in San Mateo County, a few miles from this city, and extra trolley cars and a special train conveyed large crowds, until fully 10,000 were on hand.

The best time of the day was made by the White steamer, when it encircled the mile track in 1:02. The fastest five miles made by any of the cars was scored by the Stoddard-Dayton, when it covered the second five miles in the third race in 5:31, and the fastest ten miles was made by the same car in the same event, making the entire distance in 11 min. 11 2-5 sec.

In the five-mile handicap race for members of the Olympic Club, three cars faced the starter. M. L. Rosenfeld, driving a Peerless, won in 6:07 1-5, with M. Boas, in a Thomas, second. The third race for stock cars listed at the factory for $2,750 and under, was participated in by four starters—a Stoddard-Dayton, driven by Wiseman; a Chalmers-Detroit, with Bert Dingley at the wheel; a Buick, and a White steamer. The Stoddard-Dayton took the lead, and for a little while was worried greatly by the Chalmers-Detroit, but the Stoddard-Dayton gradually drew ahead until it had a safe margin, which it kept, the Buick coming in third and the White fourth. The time of the winning car was 11:11 2-5.

In the 10-mile race for stock cars listed at $1,500 and under, Howard, in a Buick, was the winner. Time, 12:10 2-5.

The sixth race was the most exciting event of the day. Bert Dingley sent the Chalmers-Detroit ahead at the drop of the flag, followed by the Stoddard-Dayton. For over two miles it was a close struggle, but the Stoddard-Dayton in the third mile passed the Chalmers-Detroit, and held the lead to the end. Time, 11:25.

In the race for stock cars listed at $3,500 and over, there were three starters—a Thomas, Peerless and a White steamer. The White took the lead and held it to the end. A 60-horsepower Thomas touring car held second place until the fourth mile, when the Peerless got by it. Time, 12:16.

In the ten-mile free-for-all, a White, two Comets and a Stoddard-Dayton faced the starter. The latter took the lead at the start, with the Comet close up. The White looked like a winner, when suddenly something went wrong with the generator, necessitating its withdrawal from the race. The Stoddard-Dayton finished first, with Cooper's Comet second. Time, 11:23.

ANOTHER CUBAN ROAD RACE IN FEBRUARY.

Havana, Cuba, Sept. 22.—Another great automobile road race is on the eve of promotion by Havana enthusiasts. The date at present tentatively chosen is the early part of February. This will not only follow the close of the running races, but will be near to the height of the West Indian and Floridian resort seasons. The Cuban Automobile Association, which is behind the project, has secured the promised co-operation of Governor Magoon and the local authorities. The agitation for another international race is somewhat due to letters from Thomas Francis Moore, of New York, identified in the promotion of the Briarcliff race, and W. J. Morgan, who was instrumental in getting up the two former Cuban contests, urging a renewal of the international contests of 1906 and 1907. These gentlemen promise to give the race wide publicity and to bring over from the United States crack cars and drivers. E. W. Dennison, secretary of the Publicity League of Cuba, is interesting himself in the project.

Arrangements are being made to raise a prize guarantee fund. This time it is proposed to run the race on a 28-mile circuit instead of a straightaway stretch, as was done in the former contests. This is made possible by the extension of the good roads system in this province.

STEARNS WINS A BERKSHIRE CLIMB.

Pittsfield, Mass., Sept. 26.—The hill climbing contest held under the auspices of the Berkshire Automobile Club this afternoon over the State Road Boulevard, up Snake Hill and South Mountain, was brought to a close without a serious accident. For three hours the road was closed to the public and over two thousand people assembled to watch the many cars and motor cycles negotiate the difficult turns. The feature event, the free-for-all, open to cars costing from $2,000 to $3,500, was won by a Stearns, with Phillip Rosenbaum, of Florida, at the wheel, in one minute and 47 seconds. Crotty and Holbrook of Great Barrington, in a Jackson, came second, in two minutes.

In the race for touring cars, costing $4,000 or under, a Pierce Arrow, driven by J. M. Carey, was first in two minutes and seven seconds. The Stanleys had it their own way in the steam car event, G. P. Hunt, of Pittsfield, winning in 2:54.

SIXTEEN ENTRIES FOR FAIRMOUNT PARK RACE.

Philadelphia, Sept. 30.—Sixteen cars, which was the maximum number decided upon by the Quaker City Motor Club, have been entered for the 200-mile Founders' Week road race in Fairmount Park, Saturday, October 10. Several late comers had to be told that their entries could not be made. Here is the list:

Car.	Cylin-ders.	H.P.	Bore.	Stroke.	Entrant.	Driver.
Am. Locomotive	6	60	4 3-4	5 1-2	L. J. Bergdoll	Bergdoll
Maxwell	4	28	4 1-4	4 1-4	Maxwell-Briscoe Co.	Kelsey
Stoddard-Dayton	4	34.5	4 3-4	5	Hamilton Auto. Co.	Miller
Peerless	4	38	4 7-8	5 1-2	P. F. Du Pont.	Maucher
Palmer & Singer	6	60	4 3-4	5 1-2	C. A. Schroeder.	Wallace
Apperson	4	48.4	5 1-2	5	Phila. Auto. Co.	Davis
Welch	6	51	4 5-8	5	E. R. Bergdoll	Bergdoll
Studebaker	4	38.5	4 3-4	5 1-4	Studebaker Co.	Yerger
Locomobile	4	40	5	6	I. J. Morse	Tracy
Locomobile	4	40	5	6	I. J. Morse	Florida
Acme	6	45-50	4 5-8	5	Acme Motor Car Co.	Patchle
Chadwick	6	50	5	6	J. M. Munyon, Jr.	Harkins
Pennsylvania	4	38	4 3-4	5 1-4	Penna. Co.	Zengle
Lozier	4	45	5 1-4	5 1-4	Herm'n Brill	
Lozier	6	50	4 5-8	5 1-2	W. B. Herbert	
Pullman	4	40	4 15-16	5 1-4	York Motor Co.	La Roche

When the subject was first discussed among the members of the Quaker City Motor Club very little encouragement was given the leading spirits, as it was supposed that it would be impossible to secure permission from the municipal government and the Fairmount Park commissioners to conduct an automobile race over a course which included not only the driveways of the park, but also two blocks of city streets.

From the first Mayor Reyburn gave the project his hearty support, and the park commissioners were no less enthusiastic after being convinced that the race could be run safely.

WAVERLEY PLANT HAS NEW OWNERS.

Indianapolis, Ind., Sept. 28.—An important change in the automobile world took place when the Waverley department of the Pope Motor Car Company was sold to H. H. Rice, manager, and W. C. Johnson, assistant manager, of the Waverley department, representing a syndicate of Indianapolis capitalists, who purchased the property, merchandise, patents, good will, and business of the plant. The new concern will be known as the Waverly Company, and will devote its entire time to the manufacture of the Waverley electric carriages and trucks. These officers have been elected: President, W. B. Cooley; vice-president, H. H. Rice; treasurer, Carl von Hake; secretary, W. C. Johnson.

Herbert H. Rice entered the employ of the Pope Manufacturing Company in Boston in 1892, taking charge of the advertising department, where he wrote the first advertisement ever published for Colonel Pope's automobile factory. In 1895 he moved to Hartford with the sales department, and three years later took charge of the Providence branch. Since 1904 he has been at the head of the Waverley branch.

CORBIN WINNER OF SOUTHWEST RELIABILITY

KANSAS CITY, Mo., Sept. 26.—Victory in the Southwest reliability tour for the *Star* trophy perches on the banner of the Corbin, which made the entire eight-day tour of the Automobile Club of Kansas City with a perfect score. After two critical inspections at the finish, following a protest that the rear axle was sprung, the technical committee overruled all objections and awarded to Fletcher Cowherd, Jr., the entrant, the massive silver cup which is the trophy for which thirty-one cars contested.

A close second was a Rambler roadster, which finished with a score of 994. Eight other cars topped the 900-mark, and a few points against Corbin could have deprived it of the cup.

In the absence of observers there is a well-grounded suspicion against some of the high scores. It may be truthfully said, however, that the Corbin is open to no such criticism. For the first four days this car was almost constantly under the eye of THE AUTOMOBILE man, and for the other half of the tour, when perfect scores were few, the car was too closely watched by the other contestants to be able to break any rule without being detected. The refreshing fact stands out that not a voice has been lifted in depreciation of the Corbin. It made a clean fight, and finished under the rules with the best score. At the finish of the tour to-night the score stood:

No.		Miles.
13	CORBIN	1,000
31	RAMBLER	994
39	KNOX	989
16	CADILLAC	980
37	FRANKLIN	975
2	STEVENS-DURYEA	960
10	OVERLAND	952
3	PEERLESS	935
27	MAXWELL	932
21	CHALMERS-DETROIT	921
35	FORD	898
20	CHALMERS-DETROIT	896
15	PACKARD	886
9	STUDEBAKER	868
17	MAXWELL	723
7	POPE-HARTFORD	667
14	MAXWELL	479

The run really was a series of eight-day-tests, instead of an eight-day contest, as scheduled. At night the cars after checking passed into the hands of their drivers, and the garages can tell the tales of repairs, replacements, and rebuilding that went on sometimes until within an hour of the time to check out in the morning. This, however, did not count against the car, provided it could pass the night inspection at the time of checking in. As this inspection was not very rigid and did not go under the bonnets or past the grossly noticeable defects of a car, the penalties imposed under it were not very severe. The distance was almost 1,000 miles.

A Claim from the Brush Regarding Its Score.

DETROIT, MICH., Sept. 30.—Driver Huss, who drove the Brush runabout in the Kansas City endurance run, claims his score should be 777. After completing the run and being officially checked out, he states that he was informed that he had been disqualified because of his arrival at the Eureka control, Friday, three hours late. Huss could not find any checkers, and so informed the committee, which told him to continue according to schedule the following day, but later pronounced him disqualified through failure to check in. His lateness at Eureka was caused by losing his way, after going for help to assist a disabled car containing a woman and child. Including his Eureka penalties, his total loss of points aggregated only 223.

CAN RUN ENGINES IN COMMERCIAL SALON.

PARIS, Sept. 24.—Permission has been obtained from the Prefect of Police of the Paris district to allow gas engines to be run in the Grand Palais during the second Salon, to be held next December, for commercial automobiles only. In past years the commercial vehicle and machine tool section of the Paris salon has always been held in a temporary building in which it was possible to run the largest gas engines and have most of the machinery in motion without risk of fire. It was feared that permission would not be granted for this in the Grand Palais, an elegant structure dedicated to fine arts, and one of the most valuable buildings in the city. Special precautions will be taken, however, against the outbreak of fire.

The total number of exhibitors at the Paris Salon is 606, and the maximum space allowed each firm is fifty-three square feet. In the industrial section Americans will be represented by all the leading machine-tool makers; in the pleasure car show the firms having secured space are Ford, Buick, Rushmore, B. F. Goodrich Company, and Vacuum Oil Company.

MAY BE POSTPONED BECAUSE OF DUST.

INDIANAPOLIS, IND., Sept. 28.—Unless there is rain within the next forty-eight hours it is probable that the two days' reliability run scheduled for October 1-2 will be postponed until there is rain. The run, which is to be under the auspices of the Indianapolis Automobile Trade Association, is to be to French Lick and return.

HARTFORD CLUB LOSES AN ABLE WORKER.

HARTFORD, CONN., Sept. 28.—G. K. Dustin, secretary of the Automobile Club of Hartford and the Connecticut Automobile Association, has tendered his resignation to President Fuller, as he is leaving the State to take up his new duties in the position of chief engineer of the Susquehanna Railway, Light and Power Company. Mr. Dustin while in Hartford was superintendent of the Hartford Gas Works and also an enthusiastic worker in automobile circles, as the present condition of the local organization testifies. The new secretary has not yet been chosen, though several names have been suggested.

SAN FRANCISCO AGED GIVEN AN OUTING.

SAN FRANCISCO, Sept. 17.—Through courtesy of the California Women's Automobile Club, 150 aged inmates of San Francisco's public institutions were taken for an outing to-day in thirty-four donated automobiles. This is the second event of this kind that has taken place in San Francisco. Many of the occupants of the cars were helpless paralytics, or very frail. Dr. A. J. Minaker gave his careful attention to the scores of invalids. The cars assembled at the Ocean Beach, and proceeded along the boulevard to the residence of Mrs. Fremont, who had offered to Mrs. Frederick J. Linz, president of the club, refreshments for her guests.

ATTACK UPON INDIANA ROADS LAW.

INDIANAPOLIS, IND., Sept. 28.—An attack on the three-mile road law, enacted two years ago, is being made in the Indiana Legislature, which is now in special session in this city.

The law provides that upon the petition of fifty property owners in a county, a road not exceeding three miles in length shall be built, providing it connects two other improved roads. It is further provided that the expense shall be equally divided among all of the property owners in the county.

Recently a number of towns and small cities have taken action under the law to improve streets by paving them with brick and other materials. While the residents of these cities and towns have had to pay for country roads, the farmers are objecting toward sharing in the expense of improving city streets.

Mont Ventoux's New Record

By W. F. Bradley

Contestant Cutting a Corner a Bit Too Close on the Mont Ventoux Course.

AVIGNON, FRANCE, Sept. 22.—After standing for three years, the record for the Mont Ventoux has been broken. In September, 1905, Cagno covered the 13 miles on a Fiat in 19 minutes 13 seconds. This year Bablot started from the valley on a Grand Prix Brasier and climbed to the observatory, more than 6,000 feet above the sea level, in the record time of 19 minutes 8 4-5 seconds. Conditions were far from being at their best. On starting out the roads were so dry and hard that non-skids were not required; half way up there was a complete change, the mountain road being covered with a thin layer of melted snow that gave little hold for smooth tires. At this point Bablot had a lead of two minutes on the Fiat record, and would doubtless have maintained it had he been equipped with steel-studded tires. Under the unfavorable conditions, a little time was lost, but this did not prevent the Brasier clipping 4 1-5 seconds off the record.

Mont Ventoux is more than an ordinary hill climb, its length alone putting it in a class by itself. From the starting point to the observatory the distance is exactly 13.04 miles, with a gradient reaching as high as 20 per cent., certified by the government surveyors. Added to the difficulties of the grades are right angle and hairpin turns with rough surfaces overhanging precipices that are unprotected by either wall or hedge. There are difficulties of carburetion, too, the start being in the warm air of the southern valley, the finish around a snow-capped peak. Nevertheless, the 155-millimeter racer realized an average of close on 50 miles an hour.

In the stripped touring car class two minutes were clipped off the record by Deydier on a Cottin-Desgouttes, which roared up the mountain side in 22.2 3-5, the motor being a 140 millimeter four-cylinder.

Conditions were so unfavorable that several of the competitors requested that the climb should be postponed, and on the organizers refusing to accede, declined to start. No accident happened, however, the only scare being provided by Mottard on a La Buire, who swung round on himself at the St. Esteve bend and appeared for a second in danger of diving over the precipice.

Salons Straightaway Tests.

Most of those taking part in the Ventoux climb also figured in the straightaway tests at Salons two days previous. Here Bablot and his Brasier shared the honors with Alezy mounted on a 1906 Bayard-Clement six-cylinder racer. The Grand Prix Brasier covered the flying kilometer in 21 2-5 and in 21 4-5, giving an average of 21 3-5, equal to 103 1-2 miles an hour. The car was the one which the same driver handled at Dieppe, the additions for the occasion being larger sprockets, a V-shaped wind shield in front of the radiator, and a sheet metal covering for the space between the dashboard and the steering wheel.

Bayard-Clement Captured Most of the Honors.

The best time made by the six-cylinder Bayard-Clement on the flying kilometer was 22 1-5 seconds. Though both performances are good, they do not come near the record of Hemery on the eight-cylinder Darracq of Florida fame. In the touring car classes entries were plentiful, but categories were poorly filled, with the result that competition was not of the keenest, though it can be said the events were fairly interesting.

Alezy and his long, bonnetless six-cylinder Bayard-Clement, which first roared in 1906, made the fastest time on the five kilometers, standing start, his official time being 1 minute 52 seconds, equal to an average of 97 miles an hour. Bablot's Brasier occupied 1 minute 54 seconds to roar down the same poplar-lined band of perfect macadam, which was used as the course.

Alezy in Bayard-Clement Finishing 5-Kilometer Run at Salons.

Here Is Where the Storm Centre of the Great Vanderbilt Cup Race Will Be Located, and Speed in Plenty Will Be Seen.

VANDERBILT CUP CERTAIN TO RESULT IN NEW SPEED RECORDS

WHEN the list finally closes for the 1908 Vanderbilt Cup race, scheduled for October 24, it is a certainty that the entries will exceed the total in any previous event for this famous trophy. One thing is a certainty, and that is, that those that see this year's race are going to witness probably the limit obtainable in automobile speed, for the unlimited bore cars will extend themselves faster than ever before over the perfect surface of the Motor Parkway, which has been supplemented by adjoining roads placed in as good condition as is possible to make a State highway.

While the entries at first fees close in the mail of to-morrow morning, there will still be opportunity for the late comers to enter at double prices, though not more than twenty-five are likely to be permitted to start.

For the opening of the Motor Parkway itself, Saturday, October 10, a most generous entry has been made for the several sweepstakes, rolled into one as far as the onlookers are concerned, insuring the most pronounced kind of a success for the introduction of the first automobile speedway constructed.

On Tuesday Paul LaCroix nominated a Renault for the Vanderbilt Cup race, and the Matheson Motor Company named a Matheson. The day before had come a trio of entries of imported cars. W. K. Vanderbilt, Jr., designated a Mercedes; Foxhall P. Keene, another Mercedes, and Harry Payne Whitney, a Brasier. This, with the Graves' Mercedes and the Brokaw Isotta, raised the foreign division to six, and placed it only one behind in number with the American contingent, which on Tuesday was made up of two Knoxes, a Chadwick, an Acme, a Thomas, a Matheson and a Mora.

Wednesday's entries included a second Matheson and word from Bridgeport that the blanks for the two Locomobile racers had been placed in the mail. This gave a total of ten American and six foreign cars.

It now looks as though the struggle among the high-speed machines of the millionaire automobile racing contingent would be far from the least interesting feature of the great struggle.

Up to Saturday night a week before the date set for the closing of the entries for the Motor Parkway Sweepstakes, twenty-four paid nominations had been made in the five classes, into which the race is divided. The representation was as follows: Mitchell, four; Stoddard-Dayton, three; Knox, two; Chalmers-Detroit, two; Isotta-Fraschini, two; Pennsylvania, two; Palmer & Singer two; Garford, one; Allen-Kingston, one; Moon, one; Maxwell, one; Lancia, one; Hotchkiss, one; Gyroscope, one. The entrants, who manufacture or handle makes of several prices, had not given, as a rule, notice of their segregation of cars in the various price classes.

The sweepstakes promise to be by far the most novel and at the same time most exciting struggle yet conceived for automobiles. The idea practically combining five races in one, by starting the five fields at once, is a radical innovation that will probably become a feature of future stock car racing in this country. The large number of contestants will insure cars constantly racing and passing one another all along the course. The distances for the various classes differing, there will be added after the first three hours the excitement of successive finishes for the $1,000 prizes offered each prize division. The subdivisions of the sweepstakes are:

Motor Parkway sweepstakes, for cars selling above $4,000; distance 10 laps, or 250 miles.
Meadowbrook sweepstakes, for cars selling from $3,001 to $4,000; distance 10 laps, or 250 miles.
Garden City sweepstakes, for cars selling from $2,001 to $3,000; distance 8 laps, or 200 miles.
Jericho sweepstakes, for cars selling from $1,001 to $2,000; distance 6 laps, or 150 miles.
Nassau sweepstakes, for cars selling for $1,000 or under; distance 4 laps, or 100 miles.

Spectators on the homestretch will be treated to a noteworthy innovation in the establishment of a depressed official supply station stretching for 300 feet in front of the grandstand. It will take the form of a pit 10 feet wide and 5 feet deep, and will

Where the Long Island Motor Parkway Passes Under the Main Highway Near Central Park.

be reached by a switch from the main course. Here will be kept tires, oil, water, and gasoline. The heads of the mechanics will be visible above the edges of the pit. Not only will the passing of supplies and filling of tanks be seen, but the interesting operation of the quick-changing of tires also. Working space in this pit will be sold to entrants at $10 each. They will be compelled to keep their gasoline in sealed five-gallon cans and hand them to the drivers in that shape. No gasoline will be permitted to be fed under pressure, and no smoking allowed.

There will be another official supply station established on the backstretch somewhere along the old Jericho turnpike. It will not, however, be depressed. The supply men will be separated, though, from the course by a railing. In neither of the races can supplies be taken on elsewhere than at these official stations. No tires can be replaced except at these stations, except those whose tires have been thrown between stations and an extra tire has been carried on the car.

A novelty is to be tried in connection with the Motor Parkway Sweepstakes in the admission of touring cars to the cement stretch with the privilege of parking along the course. They will only be barred from the outside of curves and bridge crossings where there is danger of racing cars plunging into the crowd. Touring cars seeking these parking advantages will be admitted to the cement stretch between daylight and 8:30 A. M. They can enter by the toll lodge at Meadowbrook, or by either of the toll lodges at Bethpage and Massapequa. An admission fee of $10 will be charged. Tickets may be obtained from the uniformed toll-keepers, or in advance at the offices of the Vanderbilt Cup Commission, No. 437 Fifth avenue, New York City.

The grandstand, which is being built on one of the main stretches of the cement parkway, is nearly completed. It will seat 5,000 spectators. It is divided into nine sections, each section containing 34 boxes, or 306 in all. These boxes are along the edge of the course. Behind them rise tiers of seats to the roof. The latter will afford protection against the sun or rain. Should there be rain, by the way, there will be no necessity for a let-up of speed along the homestretch, as the cement is broomed to make skidding impossible.

Three-quarters of a mile on the old Jericho turnpike is being resurfaced. The dangerous "Flatiron turn" at the Jericho turnpike and the Woodbury road is being rounded for safety. A new road is also being built across Hempstead Plains to the beginning of the parkway. It is three-quarters of a mile in length and eighteen feet in width. Twenty-two thousand gallons of oil are to be spread on the fourteen miles of county and State roads included in the Vanderbilt circuit.

Equipment houses are beginning to offer big money to drivers. The Michelin Tire Company, for instance, will give $1,000 to first, $750 to second, and $500 to third in the Vanderbilt, providing the cars winning those places are shod with Michelins.

Lautenschlager Victim of Accident.

STUTTGART, Sept. 25.—Lautenschlager, the winner of the Grand Prix of the Automobile Club of France, has met with an accident which may prevent him racing again this season. While testing the 155-millimeter racer which he was to have driven in the Vanderbilt Cup race, the Mercedes driver burst a tire on one of the turns of the factory track and came into violent collision with a wall. Under the blow Lautenschlager had his wrist broken and most of the bones of his hand laid bare. A complete rest of one month has been ordered by the doctors, but it is doubtful if the Mercedes tester will be able to take the wheel of a racing car at the end of that time.

Emil Stricker, Mercedes Pilot, En Route.

PARIS, Sept. 24.—Emile Stricker, who has been engaged by Robert Graves to drive the Jenatzy Mercedes in the Vanderbilt Cup race, has sailed for New York. Stricker, who was born in Germany thirty-one years ago, went to the United States at the age of fifteen, and later became a naturalized American, has figured in the last two French Grand Prix races. In the race at Dieppe last July, where he piloted a six-cylinder Porthos car, he was put out of the running on the last round, while in a fairly good position, through the collapse of his road wheels on a straightaway. Stricker is well known in New York City, having been with the Mercedes company when they first imported cars in 1898, and later with the New York house of the Rochet-Schneider Company.

ENTRIES FOR SAVANNAH'S GRAND PRIZE.

The American end of the Grand Prize race was given a boost on Tuesday by the announcement that Harry A. Lozier had entered a Lozier. The noteworthy feature of the nomination was the fact that the machine in question is not a stock car, but a racing machine out and out, which was begun at the factory in June, and is said to have been so far completed as to have for some time been subjected to tuning up on the road. This raised the American contingent of candidates to four, a Locomotive, an Acme, and a B. L. M. having previously been formally entered.

The foreign contingent had a day or two earlier been strengthened by the entry by the Kaiserlicher Club of Germany of two Mercedes, one to be driven by Salzer and the other by Poegge. Previous foreign entries were three Fiats and two Benz.

The same day the announcement was made of the entry of another Buick for the light car race at Savannah, raising the number of candidates to ten, the other nominations being three Maxwells, three De Dions, and two Gyroscopes.

FOURTEEN CARS IN BRIGHTON 24-HOUR.

For its second 24-hour race at Brighton Beach, which takes place on Friday and Saturday of this week, the Motor Racing Association has secured 14 entries, with a possibility of the number being increased by two more when the starter gives his getaway signal at 8 o'clock on Friday night. Of the contenders in the last race, the Lozier "six" and "four," the Stearns, the Fiat, the Allen-Kingston, the Simplex, the Acme, and the Garford have been again entered. Harry C. Houpt has nominated a six-cylinder and a four-cylinder Thomas. Paul LaCroix, whose Renault was wrecked by an accident in the last race, has nominated two Renaults. Walter C. Allen has announced that the drivers of the Allen-Kingston will be Crane, Rippigill, and Tod Sloan, the ex-jockey. Patschke will take Strang's seat on the Acme. An entirely new entry is the Cleveland. Louis Chevrolet, who was a star track driver in the days of Morris Park and Yonkers, is named as its chief driver, with Miller and McCann as alternates. A Zust has been entered.

Short races are scheduled to be run to-morrow afternoon.

ITALY TO GIVE BIG CASH PRIZES IN 1909.

BOLOGNA, ITALY, Sept. 25.—Satisfied with the excellent results of the races just held, the Automobile Club of Bologna will next year hold a race under the prevailing Grand Prix regulations—whatever they may be—and will offer special attractions in the form of $40,000 cash prizes. The decision was arrived at at the closing banquet of the recent meet, when a subscription list was opened for next year's event. First prize will be $10,000, second, third and fourth arrivals being awarded smaller amounts. The amount promised already reaches $6,000. It had been understood that no race should be held in Italy next year, the second edition of the Grand Prix being run on the Belgian Ardennes course. Evidently this agreement will not be adhered to.

MANN LEAVES HOTCHKISS FOR DELAUNAY.

PARIS, Sept. 25.—J. J. Mann, European consulting engineer of the American Automobile Association racing board, who has been prominently connected with the Hotchkiss Company since 1902, left that firm a few months ago, and since then has been taking a rest, demanded by the state of his health. Mr. Mann has just taken up an engagement with the automobile department of the Delaunay-Belleville Company, at St. Denis, near Paris, and will have full charge of the foreign selling branches. Mr. Mann will shortly visit America.

HORSE-POWER RATINGS OF AUTOMOBILE MOTORS*

By THOS. J. FAY, President Society of Automobile Engineers.

INDIRECTLY, a torque curve is the equivalent of an indicator card. However, if the card is available, it becomes possible to note why a motor fails to perform up to the normal. If the card can be had, the formula will read as follows:

$$H.P. = \frac{PLAN}{33{,}000}$$

in which

$H.P.$ = the indicated horse-power;
P = the mean effective pressure;
L = the length of the power stroke in feet;
A = the area of the piston in square inches;
N = the number of the power strokes per minute;

In a single-cylinder motor, of the four-cycle type, there will be one power stroke for every two revolutions, hence, if the motor is of the four-cylinder type, there will be one power stroke for every revolution. The number of the power strokes then may be found as follows, for any number of cylinders in a four-cycle motor:

$$N = \frac{C}{4} \times S \text{ in which}$$

C = the number of cylinders;
S = angular velocity of the crankshaft in r.p.m.

In this formula the compression is taken into account, in that the mean effective pressure P, involves the same element. It will be observed, however, that the result is in indicated horse power, instead of actual horse power. The losses in the motor are not taken into account in this case and since they are of considerable moment, besides being difficult to ascertain in the absence of the brake test the method does not spell finality. Up to the present, in this discussion, the idea of predicting what the rating of a gasoline motor should be in horse power, assuming a four-cycle motor, was uppermost, but it cannot be claimed that the methods disclosed availed much by way of accuracy.

If the four-cycle motor will not lend itself to the problem, it is not believed the two-cycle motor will stand for any prognostication at all, as the variables in the latter are much more difficult to arrange. In the two-cycle motor, the compression (cold) means very little, because it is impossible to say to what extent the mixture is contaminated as a result of the speed.

Even in the four-cycle motor, the mixture is far from free of burnt residue, though the conditions are extremely good as compared with the two-cycle motor. If a formula cannot be devised that will serve for the four-cycle motor, it will be a waste of time to try to devise one for the two-cycle type. In the main, it is not essential to success to predetermine the exact power, because, if experience dictates that a certain size of motor will serve a certain purpose, it becomes a matter of the construction of the motor to meet the conditions to be satisfied.

If the ability of a motor cannot be predetermined with satisfying certainty, the natural question is: How can this ability be established in actual practice? In fixing upon this, the question will also arise as to wbether it is to be the highest instantaneous value, or the average valve, involving enough time to fix upon the latter with certainty. The Prony brake affords a means of determining the instantaneous value of the power, but it is not believed this method serves if a considerable time factor intervenes, due to the difficulty involved in disposing of the heat into which the energy is converted. A superior means, affording a long time run, involves a dynamo and the requisite instruments. Certainly there is a material difference as between the power of a motor as it is observed by means of a Prony brake, and the power average of fixed time readings for a long interval of time.

The instantaneous brake readings are likely to be influenced by the flywheel effect, and it is possible to so adjust the carbureter as to produce results that cannot be maintained for a long time. It is also possible to so time the spark as to influence the readings in favor of a high rating, if it is not necessary to maintain that adjustment for a long time. The cooling question is also one that has a bearing upon the matter, the power of a motor being affected by the temperature of the motor. If a motor is quite small, and the Prony brake is very well designed, it may be that a considerable degrees of success can be realized, but the best that the Prony brake affords is not nearly so good as the results following the use of the electrical system of testing.

While the various instruments of precision, and the general equipment used in testing, will be treated in detail in a special chapter, it may be well here to note that the Prony brake is of the absorption dynamometer genera, and depends for its success upon its ability to absorb and dissipate the heat equivalent of the mechanical effort of the motor. This heat absorption, and especially the after dissipation, is generally attended with considerable difficulty, since if the temperature increases over much, the brake shoes do not behave in a manner to admit of steady readings.

Some Prony Brake Data.

The Prony brake consists essentially of a set of brake shoes, of any suitable design, attached to a lever arm (usually counter balanced), with a means of adjusting the tension of the brake shoes and a suitable scale for weighing in pounds the force exerted at the end of the lever arm.

The customary length of the lever arm is 5 feet 3 inches for the following reason:

$$\text{H. P.} = \frac{SP}{1{,}000}$$, in which S = angular velocity of the crankshaft, if the brake shoes are attached to a drum that rotates at the same speed as the crankshaft, usually the case; P = the pull in pounds at the radius of the lever arm, usually 5 feet 3 inches, as before stated. If the length of the lever arm differs from that given, the formula must be altered to suit. For any other length, the formula becomes:

$$\text{H. P.} = \frac{2RSP}{33{,}000}$$, in which the symbols are of the same values as before given.

The brake drum should preferably be of the same diameter as the flywheel, on the ground that cast iron (the usual material) will not be safe to use of a greater diameter, provided the flywheel is of the maximum allowable for cast iron. At all events, it will not be desirable to use a cast-iron brake drum of a diameter so great as to fix the peripheral velocity in excess of about one mile per minute, at the normal speed of the motor. Even this would be a high value in some cases, involving motors with relatively large valves. The drum must be water-cooled, and for good results it is desirable to maintain the water at a constant temperature, which can only be accomplished by running water through the jacket of the drum. It might also be well worth while to have the brake shoes water-jacketed.

The brake shoes to serve the purpose have to be faced with some material that will have a nearly constant coefficient of friction, notwithstanding the severe changes in temperature, which is a matter of some concern, since but few materials seem to serve with any degree of satisfaction. Cast-iron brake shoes with cork inserts would probably come nearer doing the work than any other means. Certainly leather, or any other material that carbonizes, would not serve at all. With the cork inserts in the shoes, the question of cast iron to the same would not come up, and for a given diameter (fixed by considerations of safety) of the brake drum, the face of the shoes (slightly less than the face of the drum) would be as follows:

*Continued from page 430 of "The Automobile," September 24.

$W = \frac{350 \text{ by } H.P.}{V}$, in which W = the width of the shoes in inches; $H.P.$ = the probable maximum horsepower of the motor; V = the peripheral velocity of the brake drum in feet per minute, which for convenience might be fixed at 5,000 feet.

For a 50-horsepower motor with a 22-inch brake drum, the face would be as follows: $W = \frac{350 \text{ by } 50}{5{,}000} = 3.54$ inches; the drum might well be four inches, thus affording a little margin.

The above will only hold true if cork inserts are provided in the brake shoes and with the water maintained at a fairly constant temperature. The scales might all be of the beam type, of the better grade, with the arm graduated to quarter pounds, or finer. The means for putting tension on the brake shoes should be quick-acting and operate by minute increments. Indeed, it is in connection with this detail of the design that most Prony brakes become so very troublesome as to debar their use, unless for the most crude and unreliable tests. With a crude method of altering the pressure, the shoes chatter and the scale readings become a mere guess.

The speed in r.p.m. cannot be taken by means of an ordinary speed counter, a calibrated tachometer being absolutely necessary, the finer (dead beat) types giving instantaneous values.

Safety is a matter so much to be kept in the mind's eye that it will not be out of place to call attention to the dangers to be encountered in the use of the Prony brake. In a cast iron wheel, no matter what the area of the section of the rim, the centrifugal force, resulting from the speed, will set up a tension in the rim independent of the area of the section.

Speed Should Be Kept Within Bounds.

In testing a motor, while the normal speed may be quite low, the chances of the "free" speed being very much higher are very great. The normal speed of a motor might be, say, 1,000 r.p.m., while its "free" speed might be 3,000 r.p.m. This would be a little unusual, since it seems to be the case, in general, that the best power of a motor lies somewhere near two-thirds of its free speed. At all events, if cast iron is the material of the brake drum, and it is designed for 5,000 feet per minute at the normal speed of the motor, it becomes necessary to consider what would be the result of three times that peripheral velocity.

For cast iron the tension in the rim section would be: $T = \frac{V^2}{10}$, in which V^2 = the square of the peripheral velocity in feet per second; T = the tension in pounds per square inch.

For the case in point: $T = \frac{250^2}{10} = \frac{62{,}500}{10} = 6.250$ pounds per square in. $V = \frac{15{,}000}{60} = 250$ feet per second from 15,000 feet per minute.

Cast iron is a product upon which no reliance can be put beyond a certain point. It matters little that tests showing as high as 35,000 pounds per square inch (tensile strength) can be cited; it is not safe to accept over 18,000 pounds per square inch, nor even this figure in a case of this sort, unless the castings are very good indeed from well-executed designs and in accord with the characteristics of cast iron. Even so, the factor of safety is not quite what it ought to be, while on the other hand, it is not well to reduce the diameter of the brake drum below the possible maximum, considering cast iron. If steel castings are adopted instead, then the diameter might well be at least 24 inches, on the ground of a better performance of the brake.

As it is, the factor of safety is barely three to one, and it is true also that no account has been taken of the fact that the brake drum must survive under severe conditions of service, due to variable pressures and sudden changes in temperature, for, even if the water-jacket is well devised and the attendants look well to the details of the task, the time will come when the drum will be allowed to heat up to the maximum for the work. Perfectly uniform walls of no great thickness will best serve the purpose, in the case of the brake drum, for then the metal will be of the greatest unit strength, defects will not be so difficult to discover, and the heat will be the more readily disposed of. In designs of this sort, perfect symmetry is of the greatest importance, and at such high speeds the drums must be statically and kinetically balanced, the radii must be liberal, and thick sections of metal should not be directly attached to thin sections.

Some Primary Considerations.

Before motors can be tested, they must be designed and constructed, while the test equipment must also be devised on a basis of the probable requirements. Leaving entirely aside the question of the extent to which precedent may be followed, principles must be uppermost, unless a "Chinese copy" of some motor already built and of known characteristics is the sole product. The motor must be designed specifically for the car it is to actuate. If it is heavy, the car will be heavy in two ways; that is, for two reasons, which may be set down as follows:

(a) The heavy motor will add weight to the car.

(b) The chassis framing must be made rigid and strong in proportion to counteract the ills of the extra weight in the motor.

The power of the motor will be in proportion to the square of the diameter of the piston (bore of the cylinders), will bear some relation to the number of the cylinders, and will, furthermore, be influenced by the stroke. The power requirement is dependent upon the weight of the car, the attainable speed and the wind resistance, which becomes a factor, if the speed is above 20 miles per hour. There are numerous other influences besides, as the road, tires, and the details of design of the car as a whole. The right motor for the purpose then will be the one as follows:

(I) Adequate in point of power for the intended service.

(II) Of the maximum "weight efficiency," without sacrificing stability.

(III) Of the utmost thermal efficiency, consistent with the above considerations.

To have the motor as light as possible, without considering the cost of maintenance, would be as much of an error as to design for the highest possible thermal efficiency without respect for the weight efficiency. It is unfortunate that the thermal and the weight efficiencies are not coincident.

The stroke has an important influence on the two efficiencies, barring the question of compression, and is the topmost factor of control. The short stroke motor is the lightest in weight, while the long stroke motor will show better in point of thermal efficiency. Where to draw the line is a matter that practice has never settled, because in practice the stroke has receded from 12 to 4 inches, and now that it is very short, the tendency is again to increase it. The cost of fuel renders it desirable either to bring about a reduction in its price or to strive for a higher thermal efficiency.

For some years the stroke has held between 7 and 4 inches with but very few over 6 inches. The 1909 cars will be largely of the very short stroke type, mostly with four cylinders and rather high speed, with quite large valves in proportion and a fairly high compression, as automobile motors go. Motors so designed will be light, and the power will be that for a high weight efficiency rather than for a high thermal efficiency. Abroad there is a recession to the lengthened stroke, in view of the hankering for a higher thermal efficiency, since it is in France, Germany and the other Continental countries that fuel is more expensive.

Stroke Length as Influenced by Fuel Cost.

To what extent it is desirable to lengthen the stroke to placate the buyer of the fuel is a matter not so acute in America, because in this country fuel is not so expensive, while on the other hand the roads are not so good. This latter consideration is one of some import, for with inferior roads high weight efficiency becomes the matter of moment. High thermal efficiency, at the expense of weight, is something to consider, if the roads are good. In other words, the amount of fuel used, if the roads are not so good, will be least in the case of the lighter automobile of lower thermal efficiency.

To what extent the stroke is responsible for increased weight,

on the one hand, and increased thermal efficiency on the other hand, is a matter not so easy to dispose of. That the weight will be materially less if the stroke is short goes without saying. The extent to which the short stroke decreases the thermal efficiency, however, is not a matter to be disposed of offhand. Not considering the carbureter, it will be possible to indicate the lay of the land, as the stroke *per se* tends to influence the situation. The curve, Fig. 1, shows the increase in horsepower attending an increase in stroke, with a fixed bore and all other conditions as nearly constant as possible. This curve cannot possibly be regarded as representing an abstract situation, apropos of all motors and of the widest range of cylinder dimensions. It is strictly limited to motors of bores less than 8 inches and over 4 inches. These limits must be applied, because numerous conditions will render themselves manifest if the bore is increased very much, while very small motors are a law unto themselves.

From the curve it would appear as if the very short stroke motors would scarcely afford the ability necessary to render their construction desirable, or may we say profitable. Short stroke motors deliver power on a high plane from the weight efficiency point of view, and it is only relatively that they look so discouraging. To illustrate this situation, it will be necessary to give evidence by way of a weight efficiency curve under as nearly the same general conditions as the author can, in view of the difficulty involved, due to the lack of uniformity of the data extant on this rather important matter.

Results Shown by Power-Weight Curves.

Fig. 2 shows the decrease of weight efficiency, as the stroke is increased, considering a constant bore and a constant piston speed. This is given merely to show the trend, and is quite as accurate as it can be under the conditions governing the comparison of these two factors.

The conclusion to be reached is that the power will be doubled if the stroke is doubled (starting with the shortest stroke in vogue), while the weight efficiency will change to 120 points for the long stroke as compared with 100 points for the short stroke. Thus it would seem to be a good thing to increase the stroke, especially if we look no further. But the increase in points on the weight efficiency scale means an increase in the actual weight of the motor of 100 per cent. This is vastly more than would obtain for double the power, if that increase were to be effected by means of an increase in bore, rather than by doubling the stroke. Indeed, double the power might result with an increase of 50 per cent in weight by changing the bore and sticking to the short stroke. Obviously, the long stroke is not so valuable, if the car is to be light, nor will the increased thermal efficiency be of such value as to make up for the fuel cost of "toting" the increased weight over the average American roadway.

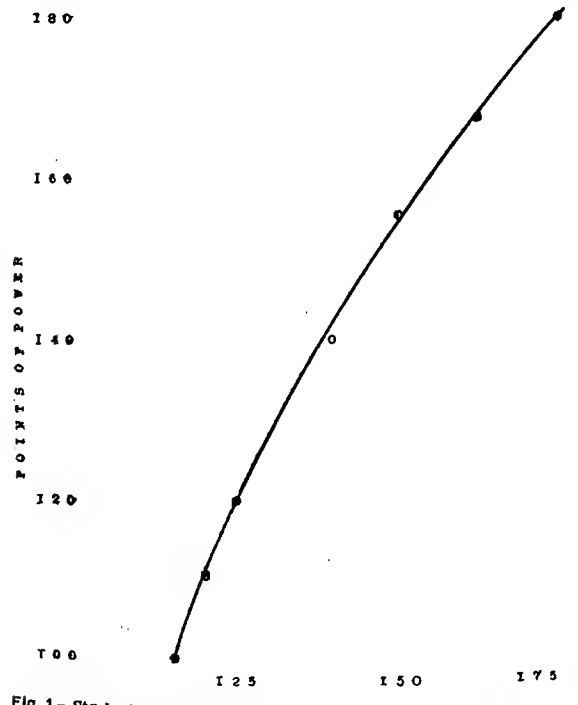


Fig. 1.—Stroke in millimeters for a four-cylinder four-cycle motor bore equals shortest stroke.

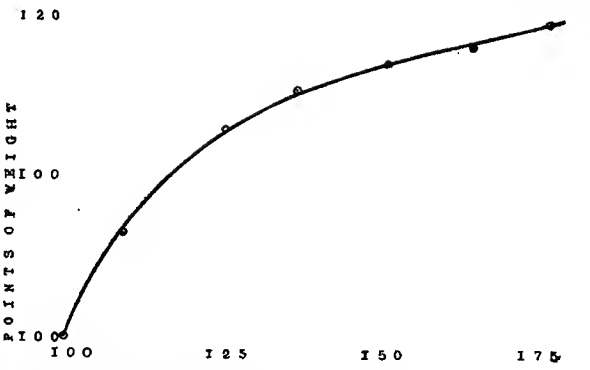


Fig. 2.—Stroke in millimeters for a four-cylinder four-cycle motor bore equals shortest stroke.

It is true that the thermal efficiency will be higher in the case of the longer stroke motor, because the scavenging is more complete, and the time per phase of each cycle is greater, the number of oscillations of the mixture in the intake is less, since for a given piston speed the number of changes in direction are reduced. But there are other conditions besides, as for illustration, the timing is more exact, the lag of the spark being considerably reduced, if the stroke is considerably longer. The valve action is sharper, more pronounced, and losses in the passageways are less noticeable. No mention has been made of the differences in mechanical losses, the inertia component of the reciprocating mass being more pronounced, if the stroke is short, the piston speed being the same for both. This latter consideration will be subject to a correction, if the long stroke motor is designed in such a way as to have massive reciprocating members; very often the case.

It cannot be claimed that the long stroke motor has an advantage on any count involving the initial compression, because it is possible to show that the short stroke motor is amenable to whatever treatment will afford benefits by way of adjusting the compression. It will avail nothing to discuss the question of increasing the piston travel in the long stroke motor, because it is the short stroke motor that best withstands such treatment. Nor is it due to the more complete expansion in the long stroke motor that the increase in power is to be expected. The increase in power is largely due to the more nearly constant compression and the more nearly "flat top" curve of torque. In the short stroke motor the "cold compression" is quite as high as in the motor of the longer stroke, and there is no reason why the initial compression should be less in one than it is in the other.

At the higher speed of the short stroke motor the torque falls off, and it is not so to the same extent in the long stroke motor. It is principally in this regard that the short stroke motor offends, and on this account more than for any other reason, increasing the stroke increases the power.

In spite of all these more or less obvious defects of the short stroke motor, it is very satisfactory in operation, and in more ways than one it has the advantage of a longer stroke. It is something to keep the weight down and more to establish a low center of gravity; it is also desirable to be able to cast the cylinders with the least number of "wasters."

(To be Continued.)

USEFUL THINGS FOR THE AUTOIST TO KNOW

OVER-HEATING of the engine, when not traced to poor circulation, is almost always caused by too much gasoline. There are, however, many possible causes of over rich mixture, some of which on the face of them might seen rather to be causes of lean mixture rather than rich. Prominent among these latter is too low a gasoline level in the float chamber due to the float valve closing too soon. The immediate effect of this is to make the mixture too lean at starting and at low speeds. Starting is therefore difficult, and if the auxiliary air valve begins to open at the usual motor speed the mixture will again be much too lean. These symptoms, however, unless properly interpreted will probably lead the owner to increase the gasoline supply, or to adjust the spring tension of the auxiliary valve so that the latter will not open until quite high speed is attained. In other words, he adjusts to give a suitable mixture at one speed and at other speeds the mixture is extravagantly over rich. It is well not to be too easily satisfied with the carbureter's performance, as it may be found that one fault such as the above has been imperfectly offset by another fault in the other direction instead of the correct adjustment being made wbere the fault really lies. A good carbureter will give a sensibly correct mixture at all speeds within the ordinary range of tbe engine. If is fails to do this the thing to do is to investigate until the trouble is found.

Keeping the Lens Mirrors Clean.

Few owners of cars, even those who drive frequently at night, appreciate the importance of keeping the lens mirrors and front glasses clean. A greasy or dingy surface such as follows one or two evenings' driving absorbs a considerable percentage of the light from tbe flame. By far the best and handiest thing to clean the lens mirrors is a mixture of equal parts alcohol and water. Denatured alcohol answers the purpose perfectly well. Pure alcohol evaporates so quickly that it leaves the greasy film pretty much as it was, whereas a 50 per cent solution evaporates more slowly and gives time to wipe the glass clean. It would be an excellent idea for every garage to keep a bottle of this solution and some clean rags always on hand. While on the subject of lamps it is worth mentioning that all gas tubing from a generator should slope either downward or away from the generator, and there should be provision for draining it at its lowest point, since there is a gradual condensation of water in the piping which, if it collects in pockets, results in objectionable flickering.

Changing Carbureter Spray Jet Size.

Occasionally a carbureter is found to be too large for the engine or to have too large a spray orifice. The advice has been given in such a case to reduce the size of the spray orifice by lightly pening the top of it with a hammer. This is counsel of doubtful value, even if the hole be afterward reamed true, since it is manifest that the burr formed in the top of the orifice cannot possibly be deep enough to be at all regular in its form. It will almost inevitably throw a jet slantwise instead of straight, and this jet failing to strike the main part of the air stream will be only partly atomized, with resulting misfiring and general bad behavior, especially at low speeds. If a new nozzle of smaller size cannot be substituted, the best thing to do in case there is no needle valve to adjust the flow of gasoline to the jet is probably to warm the ingoing air as much as possible, in order to make evaporation by temperature take the place of atomizing due to the air's velocity.

Large Oil Gun a Valuable Adjunct.

A handy appliance for the garage and even for the private owner is a large quick action oil gun, which is easily made from an old bicycle pump by plugging up the outlet and drilling and tapping the bottom plate for a nozzle. The bottom plate can be cut down to the diameter of the pump barrel in case it has an extension to be held by the foot when pumping. Autoists will find such an oil gun as the above handy in many ways, as for quick filling of lubricators and scattered oil cups. It is very convenient also for sucking out the oil from the gearcase when a fresh supply is to be put in. This oil is usually too stiff to drain out, and as it is too full of steel chips to be allowed to stay in the gearcase, it must be removed in some manner. Obviously for such use the nozzle of the oil gun should be short and fairly large to permit the thick oil to enter.

Quickly Locates a Knock.

Tracing a knock is sometimes a puzzling job. It may be in one of tbe main bearings of the engine, in the camshaft bearings, in a loose valve lifter, in a loose camshaft gear key, in a loose pump or magneto drive coupling, an unsuspected loose bolt between two parts supposed to be fast, or in any of a dozen or score of other unsuspected places. A valuable aid in locating a mysterious knock is a flexible speaking tube such as is used with phonographs. One end of such a tube can be held to the ear and the other moved about from point to point until the exact spot is found where the noise is loudest. Another aid is a light bar of iron, one end of which is pressed against the part where the knock is suspected and the other touched to the forehead or the teeth, when the sound is clearly transmitted.

Handy Piston Head Scrapers.

In most engines the piston heads can be scraped clean of carbon without removing the pistons from the cylinders by means of specially formed scrapers introduced through the opening over the valves, or through the spark plug holes when the latter are horizontal. The form and size of scraper will depend on the particular engine, but almost any suitable form may be made from 5-16-inch steel tubing about 12 inches long having the ends hammered flat and turned over at right angles in a vise. The ends are then filed straight and sharp, and the shank of the scraper may be bent to right or left, if necessary, or left straight. Frequently two scrapers will be needed in order to use both right and left hand bends. The advantage of tubing for this purpose is that no blacksmith work is necessary.

Draining Gear Box and Rear Axle.

It is a familiar fact that the gearbox requires to be periodically emptied of oil and the accumulated metal grit washed out before fresh oil is supplied. The same is true of the rear live axle casing, except that the gears in the axle do not clash and therefore do not wear out as fast as the change speed gears. At least once in a season the oil in the rear axle should be drained out, a liberal supply of kerosene introduced, and the axle jacked up while the engine is run to agitate the oil and wash out the differential, etc.

Care of the Tire Pump Leather.

The proper unguent for the cupped leather washer of the tire pump piston is vaseline. Oil is too thin and it tends to work into the rubber hose, and even into the tire itself if too much is used. Vaseline, on the other hand, clings to the leather and lasts a considerable time. If the leather becomes dry it does not hold air well and pumping to high pressures becomes impossible, while the labor of pumping even to low pressure is greatly increased.

How to Get Rid of the Squeaks.

It is very annoying to have the car rattle and squeak whenever it goes over a little irregularity in the road, and it is also bad for the car. Each squeak means friction in the spring hangers, radius rods, or brake connections, or between the spring leaves, which, if not corrected, will soon cause a permanent looseness. Liberal use of the oil can is the obvious remedy. A light-running and noiseless car is always the sign of a good driver who takes pride in his work.

MIXED FUELS FOR AUTOMOBILE ENGINES

By THOMAS L. WHITE.

IN considering the question of mixed fuels, it is well to bear in mind that there is no such thing as an ideal fuel to serve the purpose of a standard. Nor, for the matter of tbat is it altogether correct to say that any one fuel is intrinsically superior to any other. What is really implied in such a statement is that for use in the standard motor, which is an instrument designed to burn gasoline, fuels naturally grade themselves in a descending scale. On such a list crude oil would hardly find a place at all, yet given a motor designed for burning it, this fuel can hardly be surpassed. To quote from an address on "Fuels for Automobiles," recently presented by Dr. Fritz Warschauer to the Association of German Chemists at Berlin: "As the burner of a kerosene lamp is formed differently from the burner of an alcohol lamp; as the construction of a gas burner is radically different from that of an acetylene burner; so also the combustion motor must be especially adapted to the peculiar properties of the fuel used." This necessary adaptation may range all the way from the total reconstruction of the motor in its more basic features to a few easily made adjustments in the carbureter, and it may be taken that the tendency of "the attempts which are being made everywhere to produce a suitable automobile fuel" is to conserve by suitable blending the structural integrity of the automobile motor as we have it to-day.

Apart from the possibility of an increase in the fuel resources of the world due to some revolutionary discovery, the ingredients in any mixed fuel for automobile use must be confined to the following list, in which, for completeness, gasoline is included:

GASOLINE.
Averags composition, C=84, H=16.
Source, petroleum.
Boiling point, 50° to 150° Cent.
Specific gravity, .680 to .720.
Calorific value, 19,000 B. T. U.
Latent heat, small.

BENZINE.
Average composition, C=92, H=8.
Source, coal tar.
Boiling point, 80° Cent.
Freezing point, 5° Cent.
Specific gravity, .899.
Calorific value, 19,000 B. T. U.
Latent heat, small.

ALCOHOL.
Averags composition, C=32, H=8, O=35.
Source, vegetable matter, principally corn, beets, potatoes, sugar cane.
Boiling point, 70° Cent.
Specific gravity, .806.
Calorific value, 12,600 B. T. U.
Latent heat, considerable.

TAR BENZOL.
Averags composition, C=92, H=8.
Source a by-product in the manufacture of coke.
Boiling point, 80° to 120° Cent.
Specific gravity, .895.
Calorific value, 19,000 B. T. U.
Latent heat, small.

KEROSENE.
Average composition, C=85, H=15.
Source, petroleum.
Boiling point, 150° to 300° Cent.
Specific gravity, .800 to .825.
Calorific value, 19,000 B. T. U.
Latent heat, considerable.

MOTOR SPIRIT, NAPHTHA, BENZOLINE, BENZINE.
Average composition, C=85, H=15.
Source, petroleum and shale.
Boiling point, 60° to 160° Cent.
Specific gravity, .750.
Calorific value, 19,000 B. T. U.
Latent heat, appreciable.

METHYL ALCOHOL, WOOD SPIRIT, NAPHTHA.
Averags composition, C=38, H=12, O=50.
Source, the distillation of wood.
Boiling point, 66° Cent.
Specific gravity, .812.
Calorific value, 9,600 B. T. U.
Latent heat, appreciable.

ACETYLENE ETHENE.
Averags composition, C=92, H=8.
Calorific value, 25,000 B. T. U.

This last named gas is an endothermic compound, which means that, independently of its energy as a fuel, it is capable of decomposing with the evolution of heat when submitted to the action of great pressure or heat or both.

Such being the chief materials at the service of the blender, what are the principles which determine the nature of the results which we can hope to attain? The broad guide to work by is, of course, that of averages. By it the calorific value of a pound of mixed fuel can be calculated once the calorific values of its constituents and the proportions in which they are present are known. The latent heat of a blend can be figured in the same way, and within limits its behavior in passing under the action of heat from the liquid to the gaseous state. It is when we come to the actual phenomenon of combustion in the motor that the relation of what should happen to what does happen ceases to be entirely a matter of averages.

The useful work which can be extracted from a given fuel by a heat engine does not merely depend on the calorific energy of that fuel, that is, on the gross number of heat units which are liberated by the combustion of a pound of it, but also on the manner of their liberation. Thus, to take one point of importance which enters into the question of the efficiency of a motor, it makes a great deal of difference whether combustion is complete during the early part of the power stroke or is continuous during the whole expansion. Consequently, when we are considering the combustion of a given fuel in a given motor, the consumption per horsepower hour depends on two factors, one of which may be described as quantitative, and the other as functional. When two fuels are blended to make a third it is the functional quality of the mixture which evades the rules of averages. To cite an extreme illustration, although water would generally be regarded as the antithesis of a fuel, having no calorific value whatever, the addition of a small percentage to pure alcohol actually increases its thermal efficiency in the motor. And generally, when a blend is made of two fuels the effect of each on the manner in which the other liberates its energy is a factor in the thermal efficiency which cannot be calculated and which must therefore be determined empirically. This does not pretend to say that there is no room for intelligent anticipation, but simply that exact deduction is not possible.

Confusion Regarding Addition of Various Fuels.

It is a common idea that the maximum power of a motor can be increased by the addition to the fuel used of another of a higher calorific value. This belief is not borne out by facts. It is a matter of calculation, which can easily be verified, that the percentage increase in the calorific value of the blend due to the added ingredient is almost exactly in the inverse proportion of the percentage decrease of the weight of the blend which can be consumed in one stroke of the motor. Or, to put the matter another way, it appears to be a fact for all known fuels, and therefore for mixtures as well, that the calorific value of a given fuel and the amount of air necessary to burn one pound of it have a ratio which for practical purposes may be regarded as constant. There is no allowance made in this statement for variation in thermal efficiency nor for any endothermic energy which may be liberated in the motor. In the light of the fact that the specific power of a motor is thus virtually constant, it is curious to find Dr. Warschauer stating, "The addition of benzol materially increases both the inflammability and the calorific value of alcohol. The motor output, therefore, increases while the fuel consumption is reduced." If the output is larger, as stated, the increase is solely due to the functional effect of the admixture, and certainly not to the increase in calorific value.

There seems to be a general consensus that the coming fuel for the motor car will be a blend with an alcoholic base. Straight alcohol, which, owing to the unlimited quantities in which it can be produced and the tendency of the price to become lower and lower as the demand for it increases, would be the ideal substitute for gasoline were it not for the fact that for a number

of reasons it is unsuited for use in the bigh speed low compression motor. There is no necessity bere to enumerate these reasons. It is sufficient to say tbat in France and in Germany, wbere the alcobol situation is much further developed than with us, tbe problem of using alcobol in the gasoline motor has reduced itself to the problem of finding a fuel with wbich it can be satisfactorily blended.

Tbe principal shortcomings of alcobol wbich it is sougbt to remedy by blending are its comparatively low calorific value and the tardiness with wbich a mixture of alcohol vapor and air takes fire. A more vigorous ignition and a speedier inflammation are essential if the basic principle of automobile practice of seeking power in the direction of a high revolution per minute rate is to be conserved. The heavy, slow-running motor with a high compression and a large cylinder volume is tbe only alternative, and while possibly admissible for certain forms of commercial vehicle, it is otherwise too heavy and too bulky.

Seeking a Substance to Mix with Alcohol.

While it may be said tbat the admixture of any volatile bydrocarbon of tbe olefiand or aramatic series with alcohol distinctly improves its quality as a fuel, the ingredient which bas found most favor up to the present is benzol. Under tbe name of Motorine, over 2,000,000 gallons of a mixture consisting of equal parts of benzol and alcobol have been used to date by the Paris motor 'buses. It is, however, important to point out that the motors of these vehicles are specially designed to burn this blend, and their satisfactory operation cannot be taken as a proof that an alcobol-benzol mixture is a true gasoline substitute in tbe ordinary motor. As Dr. Ferhmann, the expert of the German government, puts it, "It has been proposed to mix alcohol with other fuels of high calorific value, as, for instance, benzol or ergin, and thus to increase its heating value and above all its inflammability. Witb slow motors good results have been obtained in this manner, but with high speed motors new difficulties arose as a result of the impossibility of completely burning these mixtures, so that there was a great deposit of soot in consequence of the admixture." Alcohol benzol blends bave tbe further disadvantages that the cleanly character of the natural alcohol is entirely lost, and that the exhaust from their combustion is the reverse of odorless. Also from an economic point of view, the sources from which benzol can be procured are not sufficiently extensive or elastic to allow of production on a scale which would be called for to meet a demand for alcohol-benzol mixtures.

In the address by Dr. Warschauer, from which quotation has already been made, the conclusion is arrived at that the best admixture to make alcohol more inflammable is acetylene. He says: "Probably tbe only admixture which is free from these disadvantages is gaseous acetylene. The admixture of alcohol with acetylene has been proposed by several others besides Dr. Roth. Thus, the Americans, White and Barker, bring a spray of diluted alcohol in contact with calcium carbide, thus forming an explosive vapor known as alkoethene. This fuel is therefore a mixture of alcohol vapor, air and acetylene gas. This process, which, besides in America, caused considerable discussion in France, is, however, probably not very practical, for the reason that the acetylene is generated from the carbide directly on the vehicle. Aside from the great weight from carrying along the carbide, this process involves the further objection that the acetylene is generated irregularly, especially on account of the vibration on the road." As one of the inventors responsible for this process, it will not perhaps be considered out of place for the writer to takc the opportunity here of making a brief rejoinder to Dr. Warschauer's objections.

It may be mentioned that in dealing witb the various ingredients which may be added to alcohol, Dr. Warschauer classes acetylene with picric acid, and in the opinion of the writer this association is a very happy one, inasmuch as it touches the real root of the usefulness of acetylene as a corrective for alcohol. Acetylene is not only a fuel in the accepted sense of the term. It is also an explosive. It follows that what we have called the functional action is in the case of its admixture very marked. The trouble with alcobol is its all-around slowness. In a fast-running motor it continues to burn during the entire expansion stroke, and some of it leaves the motor without being burned at all. Now, when a mixture of air, alcobol vapor, and a sufficient proportion of acetylene, wbich need not be considerable, is compressed and a spark passed, the instantaneous rise of pressure in the vicinity of the spark plug compresses the adjacent layers of gas beyond the ignition pressure of the acetylene molecules and spontaneous ignition results. Tbere is thus passed throughout the mixture an energetic explosion wave wbich travels from the spark outwards, the acetylene being progressively detonated owing to its unstable character, the alcobol in wbich it is suspended being ignited at the same time. Under such circumstances the progress of the flame cap is not by direct inflammation from molecule to molecule of the mixture, but by the adiabatic compression of successive zones of the mixture to the preignition point. Now, even on the supposition, which is of course purely imaginary, that tbe acetylene bas no fuel value, its constituent atoms remaining unburned after the liberation of its endothermic energy, the benefit to the combustion of the alcohol would still remain, for the two desiderata of a vigorous ignition and a speedy inflammation would still be realized. If it be further borne in mind that the efficiency with which a fuel can be burned in a given motor is, to take Dugald Clerk's figure, cut in two if it is burned throughout tbe stroke instead of at the beginning of the stroke, it will readily be seen that the gain due to the presence of acetylene in an alcobol-air mixture is largely independent of quantitative consideration. The answer, therefore, to tbe first objection of Dr. Warschauer is that since it is the functional action of the acetylene which is of most consequence, no very great quantity of it is required to accelerate the alcohol sufficiently, and that consequently the weigbt of carbide whicb must be carried along to generate the necessary acetylene is by no means the heavy burden which he supposes, being on the most generous estimate well under 20 per cent. of the weight of tbe alcohol in the fuel tank.

As to the second criticism, it sbould be mentioned that in making alkoethene, the air in the charge is preheated by the exhaust before passing througb tbe carbureter and the carbide chamber. The surfaces of the carbide are therefore always dry and tbe net effect of the shaking is to preserve a clean carbide surface. There results not a variable but a uniform generation of acetylene. If there were no agitation and consequently no accumulation of ash preventing the access of the vaporized dilute alcohol to the carbide with which it reacts, then an unequal flow of gas could reasonably be expected. The practice in acetylene generators of the type where the water is dropped on the carbide, of mechanically shaking the grate on which the carbide rests, may also be mentioned.

Acetylene Appears to Fill All Conditions.

Putting aside now all matters of controversional detail, it is difficult to see how the claim of acetylene as the natural corrective of the faults of alcohol can be put aside. Acetylene has the same percentage composition as benzol, and, like that compound, exerts a reducing action on any acetic acid which may be formed by the combustion of the alcohol. It has the advantage over benzol that it is cleanly; that it can be completely burned in the motor, and that it produces an odorless exhaust.

Lastly, as a commercial proposition, acetylene means carbide, and since limestone and coke, the raw materials from which carbide is manufactured, can be procured in unlimited quantities, the tendency with acetylene, as with alcohol, will be to become cheaper and cheaper as the demand for it increases. Of no other ingredient with which it has been proposed to mix alcohol can the same be said. Even if their tcchnical merits were greater, they would prove but a stopgap, and by their use the problem of finding a gasoline substitute would not be solved but merely shelved for a while. That this problem is a pressing one may be surmised from the fact that there is a standing offer by the French government of $10,000 to the discoverer of a suitable and satisfactory fuel for use in the existing motor.

LETTERS INTERESTING AND INSTRUCTIVE

HOW, WHEN AND WHY TO USE KEROSENE.

Editor THE AUTOMOBILE:

[1,559.]—Will you kindly oblige a subscriber by answering through your columns the following queries:

1. What is the consensus of opinion regarding the practice of periodically treating the cylindere with kerosene? When I first bought a car I was told to cleanee the cylinders with kerosene once a week. Now I hear it aeserted that this does more harm than good. What is one to believe?

2. If kerosene is to be used, how much and how often? Also what is the best method of procedure?

3. Will this treatment avoid the necessity of taking the cylinders down for scraping, provided of course gasoline and lubricating oil have not been used in excess?

4. How often is it well to have the engine taken down? Can the cylinders be properly scraped while in place?

5. How long does lubricating oil retain ite lubricating properties? In other worde, how often ehould the crankcase be drained?

6. "Hold-ups" by highwaymen seem to be increasing at a disagreeable rate. Doee the ordinance, in New York City, for example, against carrying concealed weapons forbid the carrying of firearms in one's automobile? A. G. D.

New York City.

1. We have never heard any objections to this practice and do not see any cause for them except laziness.

2. Many foreign chauffeurs use it after each day's run, pouring a couple of spoonfuls into each compression cock and letting it stand over night. In the morning drain off the dirty oil from the crank case and put in a fresh supply. Most owners find this too troublesome, however, and do so only once a week, or after every five hundred miles. The manufacturer of your car can give you the best advice on this subject.

3. "Provided gasoline and lubricating oil have not been used in excess," it should rarely if ever he necessary to scrape the cylinders. Otherwise, the kerosene treatment will have a very good effect.

4. Have it taken down whenever necessary; this depends on the care it has been given, as above. Whether the cylinders can be scraped while in place or not depends on the design of the motor.

5. This, too, depends on the motor. The crankcase should he drained whenever the kerosene treatment is used, and oftener, if necessary. The manufacturer can advise you best.

6. The law only applies to weapons "concealed," whether in an automohile or not; there can he no objection to carrying them openly. It would not be illegal, for example, to carry your revolver in a holster attached to the seat or the steering column.

AN OLD FRIEND IN A NEW GUISE.

Editor THE AUTOMOBILE:

[1,560.]—I have worked out a method of using up old casings which has been of considerable value to me and, I believe, would be to others. It ie to remove the clincher bead and then put the casing on another as a tread, riveting through both about every six inches on each side. I use ordinary copper rivets about 1-2 inch, with heads shaped as follows: make a mold of a piece of round iron, with the end rounded and a hole drilled for the etem of the rivet, and then putting the rivets in the mold hammer down the heads over the rounded end so as to make them slightly cup-shaped. In this shape they will not injure the tube and are not so likely to pull through. A set of old tires fixed thie way lasted me all last Winter, and a number of my friends use the same method. One might think that a casing would not go over another of the same eize, but with a little care it is easily done.

Chinook, Montana. C. F. H.

We recently printed a letter from a correspondent who had a method similar to this, hut instead of riveting merely punched holes in the old tread and laced it on with a strip of rawhide. Your method is much more workmanlike, of course, hut it is a question whether the old casings are worth so much extra trouble.

CARBONIZING AND EXCESSIVE CONSUMPTION.

Editor THE AUTOMOBILE:

[1,561.]—Will you kindly let me know in the next issue what is the cause of carbon? Have been troubled a great deal in my 1908 car. I use the best oil and do not believe there is anything wrong with the carbureter. I notice in thie particular car the people are all having a great deal of trouble, and I cannot see any cause for it outside of carbureter and oil. Would like to know if there ie any possible way of changing consumption of gasoline by changing the carbureter in any way, such as raising the float, or lowering it, or changing size of hole in jet. I am only getting six miles on a gallon and you can realize this makes expensive running. W. W.

Brooklyn, N. Y.

Carbon deposits in the cylinders are usually caused by an excess of lubricating oil, but may also come from an over-rich mixture. The best way to find out which is responsible is to examine the exhaust gases. Thick bluish-gray smoke indicates too much oil; thin black smoke, together with a very strong smell of gasoline, means that the mixture is too rich. In either case the remedy is obvious. Provision is always made for changing the consumption of gasoline. You had better not tamper with the jet, but the level of gasoline can be easily lowered by adjusting the float. On the car you mention there is also an adjustable shutter over the main air inlet; enlarging the air opening might have the desired effect. The gasoline consumption at present is certainly too large.

TROUBLES AFTER LENGTHENING WHEELBASE.

Editor THE AUTOMOBILE:

[1,562.]—Will you kindly give me your opinion on thie question in "Letters Interesting and Inetructive?" Does lengthening the wheelbase of a small runabout, by placing the rear axle about a foot further back, take off any power in the engine? Or should the loss of power be looked for in the engine? In this particular case my car, a single-cylinder Cadillac, which was a good hill-climber before the change, eeems to have hardly any power at all on a very slight grade, although it rune fine on the level. G. J.

San Francisco, Cal.

There is no reason why lengthening the wheelhase, in itself, should decrease the power in any way. The trouble is that work of this kind usually introduces complications not at first apparent. Placing the rear axle further hack makes the chain run at a considerably different angle, and this, with the added inclination when the car is on a hill, may cause it to drag on one of the axle tie-holts or a cross member of the frame. Any unusual noise would prohably be an indication of this. Again, the hrake connections may have been made to interfere somewhere in the lengthening process, causing the brakes to drag. Finally, remember that you have added at least a hundred pounds to the weight of the car, and on the hills that you are accustomed to climb this may he just the difference between high gear and low.

PROJECT FOR A TABLE OF EFFICIENCIES.

Editor THE AUTOMOBILE:

[1,563.]—As a prospective purchaser of an automobile, without more than the average knowledge posseesed by the public in general upon the subject, and believing that there is a "best" among all products, would it be poesible and agreeable for you to give the public and me through your paper a record of all gasoline makes, based upon the performance of each in competition, where regular stock cars were used. Taking every event in which each make has competed, where there were as many as, say, four cars in the event (except gymkhana contests). For hill-climbing contests figure the best time in any class as par, and the lowest as zero, and the same in races.

Reliability, economy, etc., conteste are usually figured so many pointe off from 1000. For example: "The X car" of all styles and sizes during the year September 1, 1907, to September 1, 1908, had ten cars in competition in this country, and its average for the

ten conteste was 999 pointe out of a poseible 1000. Aleo could not a table be computed on the eame baeie for five years? Price, eize and etyle are not difficult to determine, being largely a matter of individual taete and ability, but reliability, efficiency and durability seem to be the thinge impoesible to get at. M. C. CUMMINGS.

Chicago, Ill.

Such a table would be valuable indeed were it possible to make one, but consideration will show you several difficulties. In all contests the success of a car depends largely on the driver; a second-rate machine driven by an expert can often defeat a really good car with inefficient handling. There are entirely too many disturbing elements for such a table ever to be practicable. To help you out of your difficulty we can only repeat that we believe there are several hundred cars on the market which, with reasonable care, will give perfect satisfaction. If you buy a standard and well-known car from a reputable dealer you cannot go far wrong.

INFORMATION ON SEVERAL SUBJECTS.

Editor THE AUTOMOBILE:

[1,564.]—Please answer these questione through your paper:

1. What le the difference between a live type and a floating type rear axle?

2. Would it be possible, on a belt-driven motorcycle, to loosen the belt and let the motor run independent of the rear wheel?

3. Would you think a V-shaped belt, such ae used on eome of the motorcycles, would be serviceable in mountain dietricts?

4. Could you please give me the addrese of the companiee that publieh the "Motorcycle" in Chicago and "Pacific Motoring" in Loe Angeles? A SUBSCRIBER.

Newman, Cal.

1. The former includes the latter. A live axle is any axle containing parts which turn the wheels, in addition to carrying the weight of the vehicle; as distinguished from a dead axle, which only carries weight. A floating axle is a particular type of a live axle, in which the shaft which turns the wheels is independent of the axle proper, and can be removed without affecting the axle's weight-carrying capacity.

2. It would be possible to do so, by means of an idler pulley, for example, but there would be no particular advantage in such a construction for ordinary use.

3. There is no reason to the contrary, provided the belt and pulleys are of suitable proportions.

4. Motorcycle Publishing Company, 299 Broadway, New York; Pacific Motoring, 1012 South Main street, Los Angeles, Cal.

MORE ABOUT THAT 40 PER CENT. DIFFERENCE.

Editor THE AUTOMOBILE:

[1,565.]—Really you must be joking. But you have made the statement with such earneetness that I will reply. One-ninth of anything is 11 1-9 per cent. of it. One-sixteenth of the same thing is 6 1-4 per cent. of it. Subtract one of these from the other and the difference is slightly under 5 per cent. Can I say any more? Forty per cent. is a lot of difference. No, I neither smoke nor drink. An ice cream will do.

As for the public opinion, I muet stick to my statement that it provee nothing until it has been educated and agitated up to the highest point. I assume that my lawyer, my doctor, my grocer, and my tailor are epecialiets and know their business. When I wish to buy their speciality I aim to take their advice and get the benefit of their experience. If they are wise surely they will do likewise when they come to me for my epecialty.

There could be no progress if there were no leadere. Somebody muet be ahead of the masses. And since there are always leaders, the up-to-date man will keep pretty well up to them. You are not publishing a carriage journal, although carriagee are twenty times ae numerous as autoe. You devote epace to the navigation of the air although public opinion has been almost overwhelmingly against it. And if public opinion le right, I would like to know why it is that motors weighing ten to twenty pounde per horeepower are ueed on autoe in two, four and six-cylinder forms when there are five-cylinder ones to be had which weigh but three pounds to the horeepower. What ban le there on three and five-cylinder forme which the even number escapes?

And why doee the public flop eo often? Right, like truth, le immortal. If the rear-entrance tonneau met the needs of the public, as public approval indicated, why did it die out so suddenly? Simply becauee eomebody learned that eide entrances were better. And eo it goes. Public opinion is simply massed imitation. Jonee wante an auto, knowe nothing about them, so buye what he eees Smith using. Beet and only thing to do—since he will not stop to think about the subject and consider whst he wante to use it for and what it ought to be to meet his needs. And particularly since he will not take the advice of experts. But he does even worse. He eees that Smith's rig is big, so he asks for a bigger one. And many Joneeee make that eenseless thing wbich we call public opinion. The only consolation is thet Jones learne after he has owned a few autoe. CHAS. E. DURYEA.

Reading, Pa.

You have side-stepped the question entirely. The difference between one-ninth of 100 per cent. and one-sixteenth of 100 per cent. is five, or, to be exact, 4.86 per cent., as you say. But the original question was the "percentage" difference between one-ninth and one-sixteenth—something quite different.

In the last part of your letter it looks as if you were arguing against yourself. Motors weighing 10 pounds to the horsepower are used because the three-pound ones are impractical for automobile use. There is no ban on three and five-cylinder forms except their own inherent difficulties. And the public certainly showed its good sense when it adopted the side-entrance tonneau; it "flopped" only because the rear entrance had never met its requirements, and it immediately took up the first thing that did. We think the ice-creams are on you.

MORE ABOUT PERCENTAGE OF DIFFERENCE.

Editor THE AUTOMOBILE:

[1,566.]—In your lseue of September 17 I noticed Mr. Duryea's diecuseion with you ae to the difference between one-ninth and one-sixteenth. If I understand the question correctly tbe difference is only a fraction under 5 per cent. the way I figure it. I aeked another party what he figured the difference to be, and his reeult tallied with mine, although we ueed different methods. Of course figures talk, and if your figuree can talk louder tben mine. I'll take water. CINCINNATI.

Cincinnati, O.

We have answered Mr. Duryea's second letter elsewhere in this issue. You have made the same mistake of confusing the difference between two per cent.'s and the percentage difference. If you want the figures, $0.111 - 0.0625 = 0.0486$; $0.0486 \div 0.111 = 0.437$, or 43.7 per cent. You assume that by one-ninth and one-eleventh is meant one-ninth and one-eleventh of one hundred per cent., for which there is no justification whatever. The one-ninth must itself be taken as equal to one hundred per cent. This is straight arithmetic.

PROPORTIONS OF A GRINDING COMPOUND.

Editor THE AUTOMOBILE:

[1,567.]—I would be pleased to know the exact proportions to make a good valve-grinding compound. I have tried emery, but find it is apt to cut the valve. My idea is to make it up with grease eo that it will stay suspended and be ready at all times. If you could help me in this matter I will certainly appreciate it.

Syracuse, N. Y. A READER.

There are a number of ready-mixed grinding compounds on the market which give good results. If you desire to mix it yourself, the best thing to add to the emery is ordinary cylinder oil, enough to form a paste convenient to work with. The emery you have been using is probably too coarse; try a finer grade.

ARE CHAUFFEURS A DRUG ON THE MARKET?

Editor THE AUTOMOBILE:

[1,568.]—Are chauffeurs a drug on the market in New York? The Motor League of Toronto claims that it has hundreds of applicatione for jobs ae chauffeurs in that city, but no positions open. I am a carpenter by trade and get good wagee in the Summer, but am idle all Winter. I am thinking of going to New York this Fall when the works begin to be tied up to see if I could get in s first-class repair shop and learn how to handle and repair machines. Do you think this would be feasible? I have taken down en Olds 1903 runabout eeveral timee and have handled it on the road, but have no experience with other makes. PERCY N. ROWE.

Prescott, Ont.

The best answer to your question appears to be the old

saying: "There is plenty of room at the top." Chauffeurs of the engine-racing, clutch-banging, gear-smashing type are only too plentiful here, and no more are desired; but we do not think that a really good man would be long without a job. Your experience with the Olds should have taught you the principles of automobile construction, and with this you ought to be able to get a position in a repair shop. We believe that there is a better opening for the average man in the repair shop, however, than as a chauffeur.

FOR THE ATTENTION OF TAXICAB MAKERS.

Editor THE AUTOMOBILE:

[1,569.]—Will you kindly give me through your "Letters Interesting and Instructive" the following:

What are the taxicab rates for fares, etc., in New York, Philadelphia, Boston?

What is the cheapeet taxicab that can be bought and at what price; aleo what would you call the average price for American-made cabs.

Lebanon, Pa. CLARENCE S. WEIMER.

The taxicab rates in New York City are 50 cents for the first mile and 40 cents for each additional mile. For all waits the charge is 10 cents for each six minutes. We cannot give you the rates for other cities, but think that you will find the New York rates about the average. For trips outside of the city there is an additional fare, but this is dependent on the road conditions as well as the distance.

As regards the price of taxicabs, your letter will probably attract the attention of the manufacturers, who will answer this better than we could.

THE SIX-CYLINDER VERSUS FOUR AGAIN.

Editor THE AUTOMOBILE:

[1,570.]—I am undecided in my purchase of an automobile for 1909 between a six-cylinder and a four-cylinder car. Will you kindly tell me in your "Letters" the advantages or disadvantagee a six-cylinder car has over a four?

Corning, N. Y. C. W. M.

You will find material for several large volumes on this subject in the issues of this magazine during the past year, where the question has been threshed out by supporters of both types. To tell the truth, however, we believe that if you buy a car of reputable make you will never have cause to worry about the number of its cylinders.

CONCERNING THE USE OF DECARBONIZER.

Editor THE AUTOMOBILE:

[1,571.]—If my experience with the solution lately put on the market for ridding cylinders of a gas engine of carbon will assiet any of your readere, shall gladly give same. When put on the market last Spring, I secured a half-gallon and from ite continuous use, even during the hot montha, am convinced it ie a most ueeful adjunct to the proper running of an automobile. The directions given with the article call only for use as a cleanser at times, but it has been ueed right along in the cylinder oils in my car, and after any long trip would give the engine an extra cleaning with it, so that my car has not had the least engine trouble as regards over-heating, missing, eooted plugs, etc., since using the decarbonizing solution.

This method was followed: When firet applied one to two ounces were injected into each cylinder after heating up the engine and removing the spark pluge; then the plugs were put back and the engine etarted, letting it run, eay ten minutea or more, until the heavy black smoke iseuing from the exhauet would leesen up, ehowing that the solution had been used up. Then would remove the plugs again and put in each cylinder one-half gun or so of kerosene, attach plugs again, start the engine, and run as before until all the dirt and carbon were entirely blown out.

I then etopped the engine, opened the pet cocks attached to pipes, one under each cylinder, driven into the engine case, therby draining the caee of few quarte of black, sandy-like, sooty oil, which one readily could see would do no engine any special good. When all of it was removed, then I put back the normal amount neceesary for my case, two to three quarts, with eix drams, or three-quarters of an ounce of the decarbonizer eolution mixed thoroughly into a gallon of the oil. Through the oiler (tank) to the different parts of the engine fed by thie oiler, goee the eame mixture of oil and decarbonizer—3-4 ounce to the gallon—so that the engine is constantly using the decarbonizer, and the pluge from this car wnen removed are as white and clean as porcelain can be made.

I first made comparative teets from 10 ounce to the gallon down to 1-2 ounce to the gallon, and found at 3-4 ounce to the gallon the solution which kept my pluge clean. When 10 ounce to the gallon solution was used, engine heated greatly; cut thie to 5 ounce, still it heated, but not so much—plugs still white, but leae heat; then cut it to 2 1-2 ounce to the gallon, still plugs white, but lees heat; then 1 ounce to the gallon, plugs still juet as white, but no extra heating noticed at all, even on hot days; then thought I would do better by cutting to 1-2 ounce to the gallon, when I noticed plugs, when removed, were eilghtly brownish, so tried 3-4 ounce to the gallon solution, which I found the solution necessary for my particular engine. I might add that each time I changed these eolutione, the oil case was emptied with the oil gun and case filled with the mixture to he tried next; aiso the engine case drained and same strength mixture of oil and decarbonizer put back as wae being ueed in the oil case. While wasting some oil from the engine case, the experiments have well repaid me, ae I have the first trouble to occur yet from a choking engine.

In mixing the decarbonizer with the oil, better take a gallon at a time to shake it thoroughly and more easily. I have never used it in the gasoline, as I have heard reports of this manner of ueing, but should think it more economically used in the oil; aleo get to the place quickest where it is needed—in the combustion chamber. If there would he no splashing in the cylinders from the caee, then plain oil would be necessary only in the case.

To satisfy myself that the cylinders were in no way being affected, I had them off two months after ite use, and the walle of the cylindere, pietons, piston rings, etc., were juet as clean as if scraped and polished; the only place where there was carbon was on each baffle plate between base of cylinder and engine case, and thie was held there, as it could not properly get out to be blown through. The exhaust valvee had very little carbon attached, and the engine power is to-day juet as good aa after thorough overhauling.

Allentown, Pa. PALMER J. KRESS, M.D.

THE LOZIER'S MISHAP IN THE LONG ISLAND RUN.

[1,572.]—In your iseue of September 24, deecribing the incidents of the Long Ieland Mechanical Efficiency run, the etatement was made that H. M. Cashrunt'e Lozier motor broke ite differential and etripped its geare when attempting to get out of the deep sand between Amaganaett and Montauk Point. We know that thie was the common report, and you were, therefore, in a measure juetified in accepting the report ae true, but ae thie car did not break its differential and did not etrip ite geare, we believe that you will promptly make thie correction and give publicity to the following fact:

Mr. Caebrunt was an amateur driver and owner of his car, entering on his own initiative. On the first day's run, after luncheon he left the control without the authority of the committee and raced to Amagansett at a epeed of 50 to 55 milee per hour, in violation of the epeed lawe and the rules of the run. Unfamiliar with the road, he continued through the eand strip toward Montauk at racing epeed, with wheels at times up to the hubs in sand. In the eevere etrain of these conditione, the epider holding the differential geare was broken—an accident, by the way, which has never occurred before. Not a differential gear or a gear of any kind was damaged, stripped, or hroken, and when the spider was replaced, Mr. Casbrunt returned under his own power.

We have stated upon honor publicly, and repeat the statement, that there has never been a case of a broken or replaced differential or transmission gear or a broken or worn gear tooth, or one showing eufficient wear to require replacing, and we repeat this statement, and aiso the statement which we have publicly made that we do not believe that there will ever be a case of a broken gear or gear tooth in a Lozier shaft-drive car.

In view of the above facts, you can understand our wish to have thie erroneous statement corrected.

LOZIER MOTOR COMPANY,
C. A. EMISE.

MORE ABOUT MINIMUM SPEED ON HIGH GEAR.

Editor THE AUTOMOBILE:

[1,573.]—Concerning the controverey in your columne over the minimum speed of a car on high gear, probably the average driver finds that a great deal depends on the condition of the road eurface. On a perfectly smooth and level pavement I find it difficult to keep my speed down as low ae 8 or 10 miles an hour on high gear, hut where the surface is very lumpy, for example, on a bad cobble pavement, I experience no trouble in running at 3 miles an hour as shown by the speedometer. A maker's statement as to "4 to 40 miles on the high," or words to that effect, is therefore generally true enough if you put a grain of ealt in the right place.

New York City. R. M. PIERSON.

ANOTHER EXPONENT OF THE TWO-CYCLE MOTOR

ANOTHER addition to the growing ranks of the two-cycle exponents is the Bailey, manufactured by the Bailey Automobile Company, of Springfield, Mass. It is only after five years' experience with two-cycle engines that the Bailey Company has finally placed a car upon the market. It claims to have made radical improvements on all other two-cycle engines in use in automobiles, and also to have the most powerful two-cycle, four-cylinder car in the field. The Bailey is built in two models, one a three-seated speedster and the other a touring car; both are listed at $2,500.

Cylinder Casting, Showing Intake Valve.

Simplicity and sturdiness are the features of the power plant. The cylinders are cast separately, each with the upper part of its respective division of the crankcase integral. The lower half of the case forms the support of the whole motor, and has arms extending to the frame. Five long bearings of high-pressure metal carry the crankshaft and retain the pressure in the crankcases. One of the objections urged against the two-cycle engine is that wear on the crankshaft bearings will permit leakage of compression from one crankcase compartment to another, thereby reducing the power of the engine. However, as the present production of the Bailey Company shows no sign of leakage through the bearings after a very hard punishment over 6,000 miles of rough roads, this contention may be questioned. The shaft itself is made of vanadium steel with hardened and ground journals.

After a careful study of the problems involved, the Bailey Company adopted the automatic valve inlet, which is considered both simple and reliable. It admits a fresh charge to the crankcase during the entire aspiration stroke, thus causing no jerky suction on the carbureter as does the three-port system, while it has not the objectionable feature of friction in the crankcase, as in the type with rotating disc valves. The automatic valve may be seen on the base of the cylinder in the illustration; the intake manifold is clamped down over the valve. The cylinders are copper-jacketed, making a uniform jacket which can be replaced in case of accident at a very low cost.

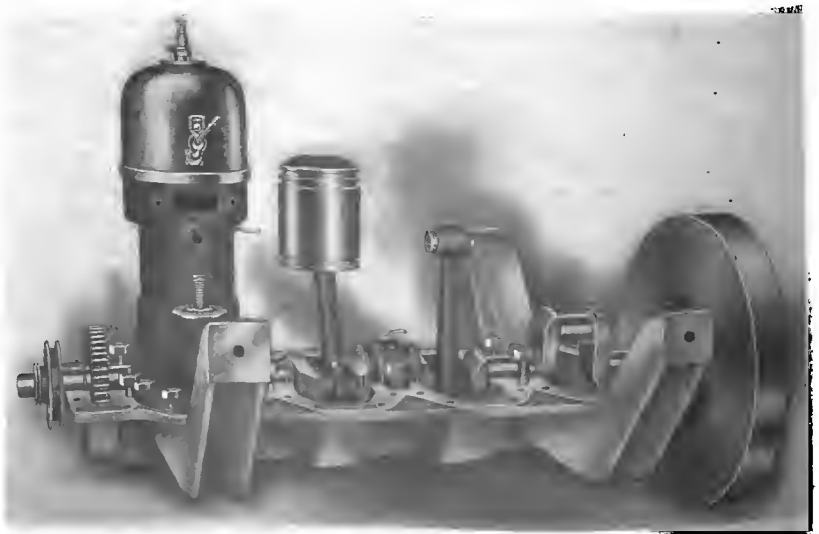
The change-gear used is the three-speed selective sliding gear type with Timken roller bearings, connected to the engine by a multiple disc clutch of the most approved type. Timken roller bearing axles are also used; the front axle is a very strong I-beam, the rear of the floating type, with bevel drive. The springs are long and easy riding. The frame is a four-inch pressed steel channel, hung very low; the wheelbase is 112 inches.

The speedster recently made a trip from New York to Springfield in four and three-quarters hours and returned in five hours, a total of 325 miles. The company is housed in a new reinforced concrete building located on Birnie avenue, and is equipped with modern machinery throughout. With these increased facilities, the output for the coming season will be considerably increased, and the Bailey will be put on the market outside of Springfield.

It is still regarded as a rather venturesome experiment for a new company to undertake to build two-cycle cars, and no doubt with reason. The automobile-buying public has only just begun to learn the advantages of this type. It has its disadvantages as well, of course, and especially for the manufacturer. The designing of a two-cycle motor is a thing not to be undertaken lightly; a few thousandths of an inch change in the placing of a baffle plate, for instance, may make all the difference between success and failure. Then, there are as yet few standards for the beginner to follow; each must depend on his own knowledge and ingenuity, and work out every new problem for himself. Considering these difficulties, it is not to be wondered at that most designers, in spite of its many alluring possibilities, have preferred to give the two-cycle a wide berth. No one can predict the outcome of the struggle between the two types; hut, in any case, the Bailey Company has the credit of being one of the pioneers who obtained for the two-cycle a fair trial.

NEW ELECTRIC WILL BE BUILT AT TOLEDO.

TOLEDO, O., Sept. 28.—The Toledo Electric Vehicle Company, which has recently been organized with $50,000 capital, will manufacture electric runabouts. An old riding academy building on Collingwood avenue has already been leased, and machinery will shortly be installed. The company is an outgrowth of the Allen & Clark Company, which operated several months at 2014 Adams street. This concern being of the nature of an experimental firm, was organized with a limited capitalization, and formed for the purpose of improving an invention of A. F. Clark whereby, it is claimed, he is able to build a battery which will, at low current, carry an electric car further than any other battery known and at a rate of about 30 miles an hour.



Bailey Motor Partly Dismounted, Illustrating Method of Mounting Cylinde

COLUMBIA MODELS ARE AGAIN TO THE FORE

By CHARLES B. HAYWARD

HARTFORD, CONN., Sept. 28.—Activity is obtrusively in evidence at the great plant of the Electric Vehicle Company these days. A day spent at the monster works of this pioneer in the country opens a visitor's eyes to the creditable accomplishments of the hustling administration of H. W. Nuckols, the receiver, and Fred Law, the chief engineer. To see between 500 and 600 men at work is to convince one of the vitality of the famous plant and its progress toward a resumption of its former position in the automobile industry. The number of men employed has reached more than 50 per cent. of normal and is being gradually increased. The decks have been cleared through the working up of the material on hand into finished cars, the last of which were sold early in August.

Lines of Columbia Mark XLVIII 29-Horsepower Car for 1909.

For the coming season, a series of 100 of the new Mark XLVIII-4 30-horsepower gasoline cars is already on its way to the assembling department and deliveries will begin by October 10. At the same time a series of 50 of the Mark LXX electric victorias is also going through. A number of the best agents has been retained, and with Receiver Nuckols acting as sales manager, in addition to his multitude of other duties, there has been no difficulty in disposing of the cars as fast as they can be turned out. A second series of 100 of the gasoline cars will be started about the end of November in order to make a stock available for show selling.

New Models Have Their Distinctive Features.

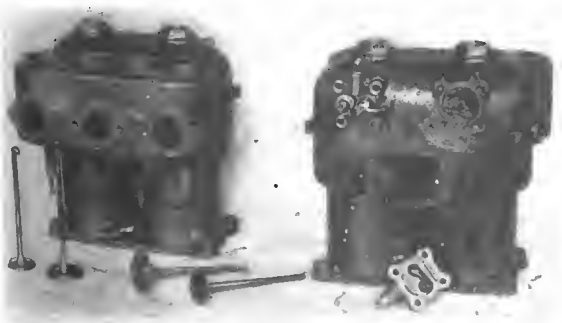
In the case of both the gasoline and the electric car, they are new models in the full sense that the word is currently employed. In other words, they are not merely replicas of the former output of the Electric Vehicle Company, but, building on these as a foundation, they have been refined and improved in not a few particulars. Where the electric car is concerned, there is naturally not a great deal of change to be noted, though both the running of the car and its mileage, as well as its service generally, have been greatly improved by the adoption of the Hess-Bright ball bearings in the running gear. Two cells have been added to the battery, bringing its voltage at the terminal up to 72, and a few other minor changes have been made, though so far as its external appearance goes, the car is the same as the many thousands of others of its kind that the company has turned out in the past, and which are now in use all over the country.

A review of the specifications of the Columbia gasoline car shows that its design has been the subject of a great deal of study on the part of Mr. Law since his return to the factory, two years ago. The price has been cut $250, now being $2,750 instead of $3,000, as formerly, but, gauging it from the standpoint of service and worth, the value of the car has been increased by more than double that amount by the improvements that have been effected concurrently with the cut of the list figures.

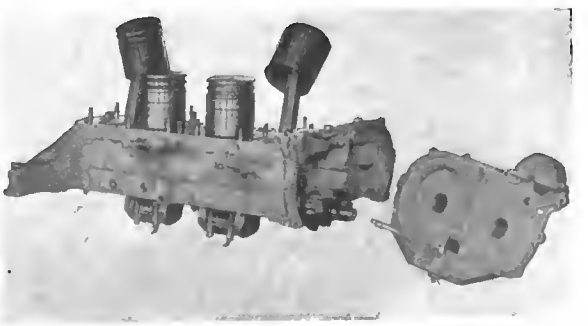
Principal Details of the Power Plant.

The motor is of the four-cylinder vertical type, with the valves on one side, but, contrary to the usual practice, the valves themselves differ in size. The inlet measures 2 1-4 inches, giving an opening 2 inches in the clear, while the exhaust is 1 13-16 inches in diameter, giving a 1 5-8-inch opening, the lift being 3-8 inch. The cylinder dimensions are 4 1-4-inch bore by 4-inch stroke, the output being 28.9 horsepower, according to the A. L. A. M. formula. The car will nominally be known as 29-horsepower, which rating is developed at a moderate normal speed, though even at the latter it shows a great deal higher figure on the brake, and, owing to its excellent valve and port design, it is capable of being speeded up to a very high r. p. m. rate at full load. One of the most noticeable features of the motor design is the H-B annular bearings on the timing shafts, so that the gears are practically supported between bearings. Bronze and nickel steel pinions are used and are protected by an oil-tight aluminum housing. Ball bearings are also employed on the forward ends of both the pump and magneto shafts.

The Electric Vehicle Company was one of the first concerns in the industry to put in a complete drop forging plant, and can probably boast as extensive a collection of dies, designed especially for automobile work, as is to be found anywhere in the



Twin Cylinders from Valve and Ignition Side.



Crankcase with Crankshaft and Piston Assembly.

Columbia Rear Axle Driving Unit Complete.

country. Drop-forgings are accordingly utilized to a liberal extent, a special grade of nickel steel being used and every part being subjected to heat treatment. Such parts as the one-piece camshaft, connecting rods, differential housing cover, and radius rod frame attachment—the last two calling for particularly intricate dies—the one-piece I-beam front axle, besides a large number of smaller parts, are all made by drop-forging. As a matter of fact, the plant is so completely equipped that everything but the wheels, tires, radiators, and side-frame members is turned out.

The chrome nickel steel crankshaft is another drop-forging of E. V. make which receives particular care. It is of the three-bearing type with an unusually liberal factor of safety in its bearing dimensions, the flywheel end bearing measuring 4-7-8 inches, while the center and front are 3 1-2 inches, the journal being 1 1-2 inches in diameter, which, together with the special grade of babbit employed, doubtless accounts for the manner in which this very essential part of the Columbia has alays stood up. The flywheel fastening is unique in design; it consists of the usual flange, but the latter carries two dowels and six studs. All are of chrome nickel steel, and the studs are provided with thimble ends which are screwed into the flange and riveted into countersunk recesses, then being finished flush. They correspond with holes in the flywheel casting which is held snug against the flange by six castellated nuts. The one-piece camshaft operates the valves by the direct thrust method, while the timing gears are of the spiral type with a 1-inch face cut at a 10 degree angle.

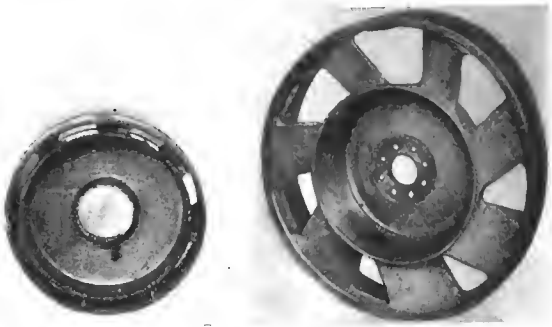
About the Motor's Accessories.

Painstaking care has been devoted to the design of the motor's accessories, the handling of the fuel and oil not alone being made as simple and efficient as possible, but likewise economical. The carbureter, which is one of Mr. Law's special designs, has a double jet, the smaller opening of which is controlled by the governor and affords speeds up to 25 miles an hour with excellent fuel efficiency. This spray jet is also controlled by the hand throttle, and is suitable for all ordinary running, giving 15 to 16 miles to the gallon of fuel. The large jet is entirely independent, and is controlled by an accelerator pedal; it is intended only for speeding. A constant circulating type of lubrication is provided, a gallon or more of oil being carried in a small cylindrical tank hung from the frame. From this it is pumped through a stand-pipe, the height of the motor, from which it is discharged to all the bearings and is then returned to the tank. A bleeder consisting of a 2-inch glass cup is located on the dash and connects with a short shunt tapped into the stand-pipe two or three inches from its return bend, so that the presence of oil in the glass is a certain indication of its circulation. The connecting rod big ends are provided with adjustable scoops to facilitate the splash, the crankcase being cast to form baffle plates to prevent excess oil finding its way into the cylinders. Ignition is by low-tension Bosch magneto, the design of the lens-bar having been considerably improved over previous models.

Some of the Drop-forgings Made in the Home Plant.

The Transmission and Running Gear.

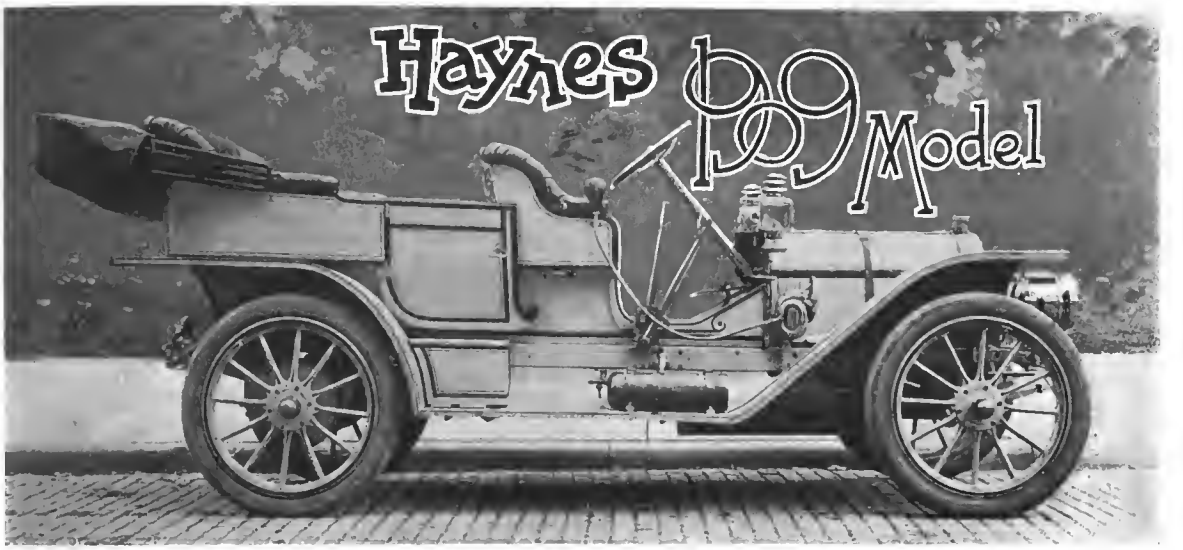
The clutch is of the plain conical leather-faced type, while between it and the propeller shaft is a three-speed selectively operated gear-set running on Hess-Bright bearings. In its control this gear-set is unique in that the hand lever, instead of picking up supplementary levers in the housing, engages with small rocking levers placed in the sector itself. Shifting laterally engages these by means of a square jaw formed on their upper ends, when the different speeds may be obtained by moving backward or forward an arrangement that works very easily and is proof against sticking. The universals used between the clutch and gear box and on the propeller shaft are of the yoke type and are turned out in the home factory, as are also both the steering gear and the entire rear axle driving unit, with the exception of its Timken bearings, which are also used in the wheels.



Fan Spoke Cooling as Applied to Flywheel and Brake Drum.

In order to make an absolutely rigid member of the rear axle, the tubes are brazed into the housing in the rough. The axle is then placed in a hydraulic press and the center pressed downward slightly. This lack of alignment is then corrected by the press rod, the turn buckles of which are permanently pinned in place, once the axle is straightened. By this means opposing stresses are set up which tend to keep the axle rigid. The entire axle is then placed in a lathe and the wheel ends turned, following which it is clamped in a jig and bored both ways, thus insuring absolute accuracy of alignment. In the case of the motor, this is accomplished by clamping the support in a jig and running long reamers through the openings for the bearings, while similar accuracy of alignment of the motor and gear-set supports on the frame is obtained by placing the latter complete in a jig with the brackets and cross braces assembled in the rough. The supports are then milled to a level face.

Another excellent feature is the assembly of the brake drums and rear wheels before boring. They are thus turned directly on the cups for the Timken bearings, which makes for absolutely true running. These drums are not only of unusually liberal dimensions, but also have an air space between the internal and external bands, with fan-shaped spokes or braces, similar to a flywheel. The front axle is a one-piece die-forging of nickel steel, specially heat-treated; suspension is by means of semi-elliptics front and rear, the dimensions not having been altered since last year, although the wheelbase has been increased to 115 inches and 34-inch wheels adopted. The Hartford rim and Hartford tires are fitted, 3 1-2-inch front and 4-inch rear, though the make is optional. A five-passenger touring body or a limousine fits this chassis interchangeably. The company is also building a car with a 5 1-2-inch "square" motor with an A. L. A. M. rating of 48-horsepower and four-speed selective gear with shaft drive, but will only turn them out as ordered.



THE Haynes Automobile Company, of Kokomo, Ind., will build only one model for 1909—a four-cylinder 40-horsepower car to be known as Model X. This is the successor of the 1908 Model W. The Haynes Company found that this model, medium in both power, size and price, appealed to by far the greatest number of purchasers, and decided that better results could be obtained by concentrating the entire factory organization on this one type. Models S and U were therefore discontinued. It has now been found possible to make many improvements on the original design without raising the price from the 1908 figure, $3,000.

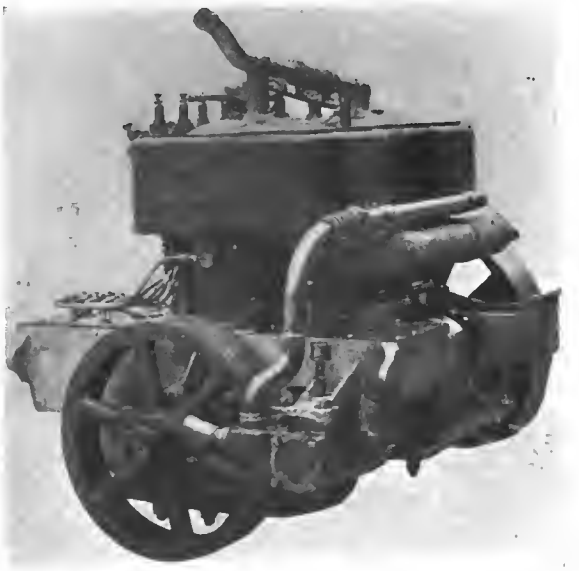
The Motor of Familiar Design.

No one in the least acquainted with former Haynes models will fail to recognize the motor. The cylinders are 4 3-4 by 5 inches bore and stroke, and are cast in pairs, with valve pockets on opposite sides. The valves are of unusual size, 2 5-8 inches in diameter; the heads are nickel steel electrically welded to the stems. Each piston has three composite rings; these consist of a heavy, plain ring, on the outside of which are two thin rings, broken at opposite sides and pinned quartering the break in the inner ring. The latter provides the expansive force, while the thin outer rings conform perfectly to the shape of the cylinder. The combination is unsurpassed for the holding of compression, and yet is very free in action. The crankshaft is turned from a heavy bar of vanadium steel, which has previously been roughly forged to shape. It runs on double sets of conical roller bearings at each end and a center bearing of Parson's white bronze.

The right-hand forward arm of the crankcase is cast in box shape, and in it is embodied the McCord oiler, gear-driven from the inlet camshaft. The corresponding arm on the opposite side is used as an oil reservoir, and is connected with the gang of pumps by a small passage in the forward part of the case. This allows an ample supply of oil to be carried for long tours. The lower section of the crankcase is divided into four separate pits for the cranks, so that the oil cannot all run to one end when on a grade. The two-to-one gear, as well as those driving the oiler on one side and the magneto and water pump on the other, are carried in a separate compartment and packed in heavy oil, thus reducing their noise to a minimum.

Two systems of ignition are provided, each entirely separate and distinct from the other. A dry-cell battery gives current for one, and a single coil with high-tension distributor completes the outfit. The other is a high-tension magneto, located on the left side of the motor. The two sets of plugs are both placed directly over the inlet valves.

The water pump is of the eccentric type, which the Haynes Company has retained after many years of experience. There are comparatively few moving parts, and their movement is very slight; it has the additional advantage of giving a positive circulation.

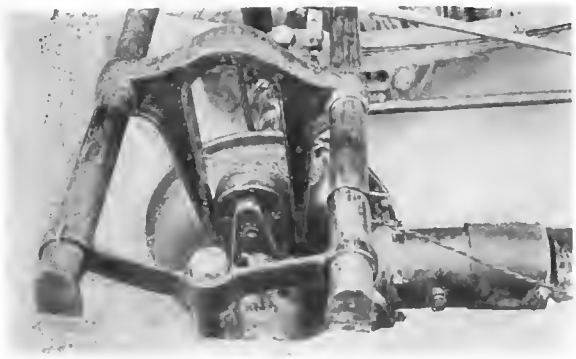


Front Quartering View of Haynes Motor with Double Flywheel.

Clutch and Master Gear.

The clutch is of the contracting band type, and is similar in action to the ordinary brake. It works on a bronze drum, which is supported in the flywheel by four arms forked at their outer ends. These forks straddle corresponding lugs on the inner side of the flywheel rim. Between each lug and the ends of the fork on either side coil springs are interposed, thus forming a shock absorber between the motor and the change-gears to eliminate strains attendant upon the sudden engagement of the clutch.

The change-gear gives three speeds forward and one reverse, controlled selectively. The master gear on the countershaft drives through a ratchet; in shifting from a higher



Haynes Improved Roller Torsion Lever.

to a lower gear, this allows the car to run ahead of the motor until it slows down to a speed corresponding to that of the latter. It is thus impossible for the momentum of the car to be exerted through the gears, and in consequence gear-stripping has been practically eliminated. The bearings of both main and countershafts are specially designed rollers, and they are carefully fitted with stuffing boxes to prevent leakage of oil.

The universal joints of the drive shaft consist of three parts—two heavy steel yokes and a square steel block. The yokes have large flat inner surfaces which bear on opposite sides of the block. Cross pins hold the block in place, but the driving strain all comes on the broad surfaces. The joints are both covered with heavy leather boots to protect them from dust and mud.

The Roller Pinion and Sprocket Drive.

The method of power transmission at the rear axle is peculiar to the Haynes, and is fully covered by patents. Instead of the usual bevel gear and pinion, a device is used which is known as a roller pinion and sprocket. The driving member consists of a shaft with two integral flanges, between which, at proper intervals, pass large steel pins. The pins in turn carry rollers, which engage the large, coarse teeth of the sprocket ring on the differential. It is, in fact, a bevel gear with roller-bearing teeth. Practically the only parts which ever show any wear are the pins and rollers, and these can be easily and cheaply replaced.

Instead of the usual torsion rod the Haynes employs a torsion roller. It is carried on a heavy arm projecting upwards from the differential easing and works in a slotted guide supported by the main frame, deep enough to allow it to move up and down with the action of the springs.

The two separate sets of brakes are both contracting and are located side by side on the rear hubs. The drums are 14 inches in diameter; the bands of the foot brakes are 1 1-4 inches wide, and those of the emergency 1 1-2 inches. The drums are hollow and may be filled with water if desired; thus they will never overheat, no matter how strenuous the service.

Choice of Body Equipment.

The touring body which is regularly provided seats five persons, but there is sufficient room in the tonneau for side seats accommodating two other passengers. The front seat is divided. All bodies are made of wood, carefully selected and seasoned. In the upholstery, nothing but the finest of hand-buffed leather and gray curled hair is used, together with the most up-to-date springs. On the runabout the seats are placed about six inches further back and are quite low; the dash is hooded. This type can be equipped with either one small rumble seat on the rear box, two small seats, or two full-sized seats.

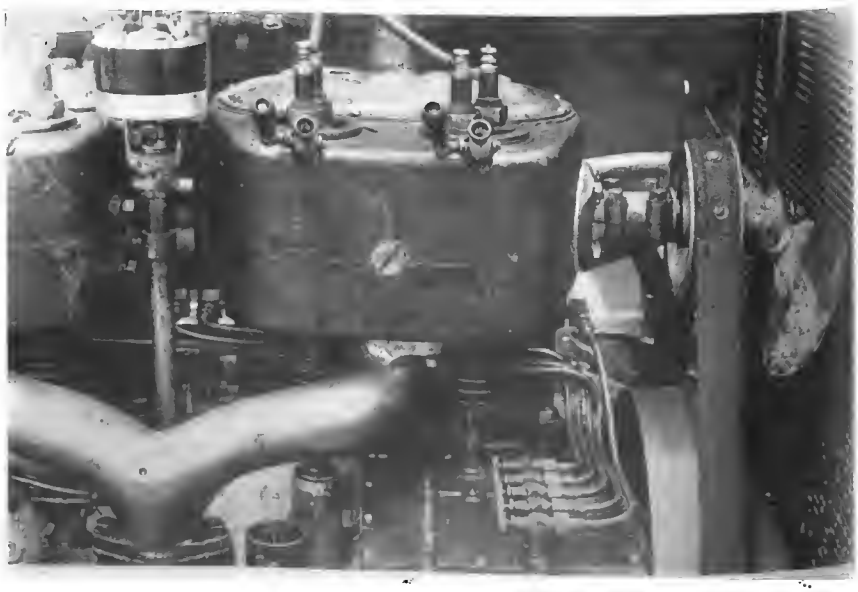
Still another type is euphoniously named the "Hiker"; it is much the same as the runabout, except that it accommodates two passengers only. The seats are set very low and tilted up about an inch and a half higher in front than in back. Behind the seats is a large cylindrical gasoline tank. Last of the line is the toy tonneau; this is simply a four-passenger touring car. The front seats are placed in the same relative position as on the runabout, thus shortening the tonneau space. The rear seat is narrowed to a width suitable for two passengers. This style of body is made to meet the demand for a light, comfortable, four-passenger body to be fitted to a regular chassis.

COOK JOINS FEDERAL RUBBER COMPANY.

CUDAHY, WIS., Sept. 28.—Otis R. Cook, who for twelve years occupied the position of general representative for the B. F. Goodrich Company in its tire department, and for the past two years held the same position with the Firestone Tire and Rubber Company, left the latter company October 1 to accept the position of general manager of the Federal Rubber Company's tire department, of this city. Mr. Cook states that this is a new departure for the Federal Rubber Company, which is a large manufacturer of mechanical and molded rubber goods, and will add to its line pneumatic automobile tires, solid motor and truck tires, solid rubber carriage tires, also a full line of bicycle tires and accessories.

Mr. Cook has associated with him Osborne S. Tweedy, who will occupy the position of sales manager, and who will look after all matters pertaining to the sales at the factory. Mr. Tweedy needs no introduction to the trade, having been connected with the Diamond Rubber Company for fifteen years as manager of that company's Chicago branch.

The Federal Rubber Company announces that it will put on the market the highest class of automobile and motor truck tire that is possible to produce and that its pneumatic auto tire will be sold to manufacturers and jobbers under special trade marks.

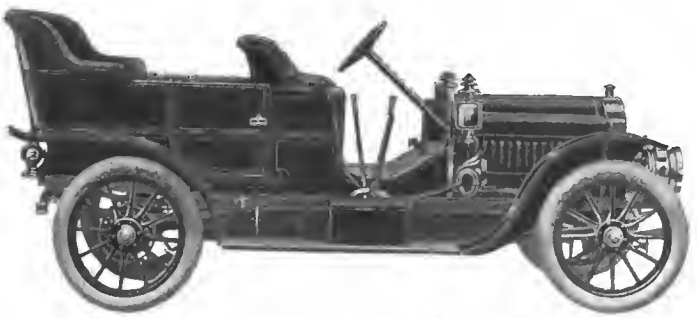


Inlet Side of Haynes Motor, Showing Oiler; Oil Tank on Opposite Side.

THE 1909 MODELS OF THE TWO-CYCLE ELMORE

ALTHOUGH numerous changes have been made both in design and mechanism, the 1909 Elmore two-cycle models will be practically a continuation of the 1908 models 30 and 40. The appearance of the cars has been considerably improved by lengthening the tonneau and raising the radiator and hood to bring them into proper proportion, and there are a number of refinements in detail.

The motor remains the same Elmore valveless two-cycle which has had such marked success in the past, with three cylinders on the 30-horsepower model and four on the 40-horsepower. The cylinders of both are 4 1-2 inches bore and 4 inches stroke. Perhaps the most radical change is the offsetting of the cylinders on the crankshaft to give a more direct downward thrust on the power stroke. The performance of the new motor shows a decided improvement over former models, both in power and steadiness. The carbureter is the regular Elmore float-feed automatic type. The lubricating system of the last two years is retained; the oil is fed into the inlet pipe, thus insuring its equal distribution in each cylinder. The side countershaft of the motor has been dispensed with, and the Atwater-Kent spark generator, which the Elmore company says has far exceeded all claims or expectations, is now driven directly.



Model 44 Four-cylinder Two-cycle Elmore for 1909.

The clutch mechanism has been considerably improved and simplified by placing the actuating spring directly behind the cone. The Brown-Lipe selective change-gear, with annular ball bearings, three speeds forward and reverse, is retained, but the support is now by integral arms, instead of from crossbars. The drive is through shaft and Spicer universal joints, which have given perfect satisfaction in the past. The front axle, of the drop forged I-beam pattern, has been modified to allow the lowering of the frame about two inches. Exhaustive tests have resulted in the retention of the rear platform springs, though a new form has been adopted that gives much softer action, regardless of the load in the car. The new springs are very finely graduated, with an increased number of leaves thinner in proportion.

The general lines of the Elmore body remain unchanged. The popular straight back, with rounded corners, is retained in the three-cylinder model. The tonneaus of both models have been lengthened, and special attention has been given to the upholstering. Mahogany dash and trim are used on the three-cylinder and Circassian walnut on the four. The height of the radiator has been increased 1 1-2 inches, not to afford larger cooling surface, but to bring the hood into better proportion with the rest of the car. Model 44, which is shown in the illustration, has a wheelbase of 112 inches, and 34-inch wheels shod with 4-inch tires. Model 33, the three-cylinder, resembles it in outline, and has a 104-inch wheelbase and 32x3 1-2 tires. An addition to the Elmore line is a landaulet mounted on the three-cylinder chassis. The roadster has been changed considerably in general style, and is furnished with two sets of rear seats, one single and one double. Thus the roadster may be called three cars in one; it may be used with flat deck, with single or with double seat.

DETROIT MAKERS ENJOY UNUSUAL PROSPERITY

DETROIT, Sept. 28.—Prosperity is being spelled in large letters these days by Detroit automobile manufacturers and makers of parts and accessories. On every hand unwonted activity prevails. Plants are running close to their capacity, and orders for next season's cars are coming in before the present year's output has all been produced in a most gratifying manner.

Within another week the working force at the Cadillac Motor Car Company's plant will be doubled, furnishing employment to 1,600 more men, and permitting the concern to work steadily day and night in order to meet the demand for its new models.

At the plant of the Ford Motor Company everything is humming, and district managers in session here a few days since gave assurance of an increase of 100 per cent in the volume of business for next season. Every energy is being directed toward completing the new factory for the Ford, at Highland Park, just north of the city, and which will, it is claimed, be the largest automobile plant in America. It is expected to be ready for occupancy by the first of the year.

The Everett-Metzger-Flanders Company, while just getting fairly started in the old plant of the Wayne, has already disposed of 6,000 cars, half of next season's anticipated output, through the Studebaker Company, and orders are coming in rapidly from other sources. Work will shortly be commenced on an immense addition to the present plant.

Of course, the Packard Motor Car Company is doing all the business it can care for the immense plant with its 3,500 employees being in full operation.

The Detroit-Chalmers is another concern enjoying its full share of the present prosperity, while the smaller concerns all report favorably on the outlook.

Parts makers are jubilant over the prospects, and the present year promises to be a successful one all the way around.

BALTIMORE TO HAVE AUTO AMBULANCES.

BALTIMORE, Sept. 28.—Motor-driven ambulances will be used by the local fire department service hereafter to convey injured firemen to hospitals, and for disabled horses of the department. On recommendation of Chief Horton, the fire commissioners have ordered two of these ambulances—one for men, one for the veterinary department.

AUTOS IN TOLEDO'S CIVIC PARADE.

TOLEDO, O., Sept. 28.—The automobilists of this city will participate largely in the civic parade to be held here the present week in connection with the annual fall festival. It is intended to make the auto division a leading feature of the procession to typify the advance of locomotion methods. The local club will add its influence, and a representative turn-out is expected.

BOOKS FOR AUTOMOBILISTS.

"The Amateur Motorist."—Max Pemberton is so well known as a writer of fiction that most readers would be apt to set his latest publication down at first glance as another addition to the long list of automobile novels of the "best sellers" class. Perhaps some will regret that it is not; for if we must have automobile novels, far better have them written by a master of the subject than by one of the type whose heroes "grasped the speed lever and the huge machine bounded forward" for twenty chapters. However, Mr. Pemberton's book is, as the name implies, simply a plain and sensible guide for the prospective automobilist.

The usual chapters are devoted to the exposition of the principles of the motor, carbureter, ignition, gears, etc., and these are written in a simple and non-technical style. Their only drawback is the constant use of English terms apt to be confusing to the average American. We are used to "tyres" and "petrol," but that "star-wheel" means a bevel gear is hardly so apparent. Following this comes some very good advice to the beginner as to the size and type of car to buy, whether or not to employ a chauffeur and, if so, how to keep tab on that gentleman, how much he should expect his car to cost for upkeep and much other useful information. Finally Mr. Pemberton catalogs all the best known English and Continental makes, giving the different models and sizes and the advantages claimed for each. Unfortunately this part, which was evidently very carefully done, will not be of much assistance to the American automobilist, as only a few of the cars described are known in this country and only one of them is of American manufacture. Chapters on motorboating and motorcycling are also included.

The volume is bound in plain and workmanlike style, as befits a text-book, and is illustrated with many full-page photographs of men and cars, as well a sdrawings explaining the text. The publishers in this country are A. C. McClurg and Company, of Chicago, and the price $2.75.

"Road Preservation and Dust Prevention," by William Pierson Judson, C. E., provides a much-needed source of information on a subject which is being brought more and more to the attention of the public. The book should be studied by the road officials of every State and city in the country. It aims to furnish the information clearly and concisely, and is easy reading for anyone interested in the question. Much needless expense can be incurred and much damage done by attempts to use oils and other road binders without sufficient knowledge of the suitability of the material for meeting local conditions. Mr. Judson is a recognized authority on the subject, and has given details of many personal experiences. The book is published by The Engineering News, 220 Broadway New York City.

A "WORLD'S TOUR" OVER JERSEY HILLS.

MADISON, N. J., Sept. 28.—There is to be another automobile "tour of the world" among the hills of Morris county, N. J., this autumn, along the lines of the motor car trips for charitable objects promoted in the past by the fashionable folk of the Oranges and Montclair. The tour is to be the joint promotion of the Y. M. C. A. branches at Morristown and Madison and the Boys' Brigade and Girls' Club of Chatham, under the corporate title of the "International Touring Company," whose president is James H. McGraw, and the general manager is Herbert Strong.

The date set is Saturday, October 18. The route laid out covers some 15 miles. The cities to be visited are: "Madrid," J. H. McGraw, Madison; "Yokohama," C. M. Decker, Madison; "Berlin," F. C. Blanchard, Morristown; "Constantinople," L. B. Tompkins; "Damascus," Homer Davenport, Morris Plains; "Pekin," J. M. Gifford, Chatham, and "Washington," C. F. Wheeler. The national capital, which will be the starting point of the tour, will show the White House, a G. A. R. post, and a booth of Puritan maidens.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows and Meetings.

Dec. 31-Jan. 7..—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reeves, General Manager, 29 West 42d St.

Jan. 16-23.....—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. M. L. Downs, Secretary, 7 West 42d St., New York City.

Feb. 6-13.....—Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. S. A. Miles, Manager, 7 East 42d St., New York.

Mar. 7-13.....—Buffalo, Second Annual Power Boat and Sportsman's Show, Convention Hall, Dal H. Lewis, manager, 760 Main Street, Buffalo, N. Y.

Races, Hill-Climbs, Etc.

Oct. 1-2.....—Indianapolis Two-day Reliability Run to French Lick Springs and Return, Indianapolis Automobile Trade Association.

Oct. 2-3.....—New York City, Brighton Beach Track, 24-Hour Race, Motor Racing Association.

Oct. 6-9.....—Chicago, 1,000-Mile Reliability Run, Chicago Motor Club.

Oct. 7-9.....—Cleveland, O., Three-day Reliability Run of the Cleveland Automobile Club.

Oct. 10.....—Providence, R. I., Narragansett Park, Race Meet, Rhode Island Automobile Club.

Oct. 10.....—Philadelphia, Founders' Week Stock Chassis Race, 195 Miles, Quaker City Motor Club.

Oct. 10.....—Long Island Motor Parkway Sweepstakes, Conducted by Vanderbilt Cup Commission.

Oct. 10.....—Providence, Narraganeett Park, Race Meet, Rhode Island Automobile Club.

Oct. 10.....—Morristown, Madison, Chatham, N. J., Automobile Carnival and "Tour Around the World," under Y. M. C. A. auspices.

Oct. 17.....—Hartford, Conn., Hill Climb, Automobile Club of Hartford. (Probable Course, Avon Mountain.)

Oct. 24.....—Vanderbilt Cup Race, Long Island Course, auspices of Vanderbilt Cup Commission.

Nov. 26.....—Savannah, Ga., Grand Prize Race, Savannah Automobile Club.

FOREIGN.

Shows.

Sept. 24-Oct. 4..—Bourges, France, International Exhibition for Agricultural Motors.

Oct. 11-18.....—Paris, International Congress and Public Exhibition on Roads and Road Making for Modern Locomotion, French Ministry of Public Works.

Nov. 28-Dec. 13.—Paris, Eleventh Annual Salon de l'Automobile, Grand Palais, Automobile Club of France (Pleasure Vehicles, etc.)

Dec. 20-28.....—London, Stanley Show, Agricultural Hall.

Dec. 22-29.....—Paris, Eleventh Annual Salon de l'Automobile. (Commercial Vehicles, etc.)

Jan. 16-25.....—Brussels, Show Organized by Belgian Chamber Syndicate, Palais du Cinquantenaire.

Races, Hill-Climbs, Etc.

Oct. 2.....—France, Gallion Hill Climb.

Oct. 11.....—Berlin, Germany, Gordon Bennett Balloon Race, Aeronautical Club of Berlin.

UNJUST VERDICT AGAINST AUTOIST REVERSED

HARTFORD, CONN., Sept. 28.—Judge John Coats of the Court of Common Pleas is surely not a motorphobe or anything of like nature, for he has just set aside a verdict rendered the owner of a horse outfit which got in the way of a slow-moving automobile some time ago. The verdict was in favor of the horse owner, and was for $150. Commenting on the above-mentioned verdict, Judge Coats says: "Upon a careful examination of the evidence, I cannot escape the conclusion that manifest injustice would be done to the defendant if the verdict in the case should be allowed to stand. In my opinion, the verdict is so manifestly contrary to the evidence that I cannot escape the conclusion that the jury disregarded the instruction of the court respecting the law in the case, or mistook the evidence, or were influenced by prejudice or partiality in reaching their verdict."

DETROIT ADOPTS THE PACKARD FIRE WAGON

DETROIT, Sept. 28.—The Detroit fire department has inaugurated an automobile system which is not only a departure from ordinary fire department practice, but which promises such increased efficiency that the fire chiefs of all the large cities in the country are closely watching it. The new vehicle is a Packard "Thirty" touring car chassis converted into a fire wagon with a special body and equipment, making it suitable for carrying a squad of firemen about town with the speed of the fastest touring car. The truck is now located at one of the stations, but will eventually have a separate house built for it. It has its own organization of fifteen picked men, including captain and lieutenant, forming what is locally called the flying squadron, the purpose of which is to reinforce any regular company in the city in time of need.

Packard "Thirty" Fire Wagon, Placed in Service by Detroit Fire Department.

The fire fighting forces of Detroit have been in need of enlargement for some time. Last winter the legislature passed an act authorizing an increased annual expense of about $190,000. After considerable study of the proposition, the fire commissioners decided to use automobiles and a small number of men, instead of a large number employed in the usual way. They therefore asked several automobile companies to bid on the manufacture of a special wagon which would have all of the speed and general efficiency of a high class touring car and at the same time be able to carry a normal load of twelve men. The contract was given to the Packard Motor Car Company, and last week the wagon made its début as a fire-fighting machine.

The chassis is practically standard with the exception that it has heavier springs than the touring car, in order to take care of the additional load. The twelve men are carried, two on the front seat, six on the lengthwise seats of the tonneau, two on the rear running board and one on each side running board. Special handles are provided for the men on the running boards. Provision is also made for carrying three hand fire extinguishers, two on each side and one in rear.

AN AUTO ENGINE AND HOSE WAGON COMBINED

INDIANAPOLIS, IND., Sept. 28.—The Independent Hose Company, of Frederick, Md., has recently installed a piece of apparatus manufactured in this city which differs considerably from other adaptations of the automobile for fire-fighting service. It consists of a hose wagon and fire-engine combined, and with its driver takes the place of an ordinary hose wagon, a steam fire engine, four horses, two drivers and an engineer. As a hose wagon it will carry 1200 feet of hose at a speed of from four to thirty-five miles an hour, and as a water-throwing engine it has the capacity of a third-class steamer. The chassis carries a six-cylinder automobile motor of 60-75-horsepower, connected with a six-cylinder eccentric-operated pump in such a way that the change from road-wheel drive to pump drive can be made by the movement of a lever.

At a recent test at Frederick, Md., before some of the leading mechanics and automobile experts of the State, it threw a 1 1-8 inch stream over a church steeple 150 feet high, and threw two 7-8 inch streams 180 feet and three 3-4 inch streams 160 feet. Needless to say, that fire was settled in record time.

The manufacturer, the Howe Engine Company, of Indianapolis, is now building another machine of the same type which will carry two 35-gallon engines besides regular equipment.

Howe Auto Engine and Hose Wagon, Recently Installed at Frederick, Md.

THE AUTOMOBILE

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THE KIND OF EFFORT THAT COUNTS.

Such gatherings as that of the Associated Automobile Clubs of New Jersey held last week at Atlantic City, count more for the general good of automobiling than a score of high speed racers, and in this direction and similar channels the real work of the various State bodies of the American Automobile Association should be kept centered. Best of all, in the success of the good roads convention at the New Jersey seashore resort, the dominating feature was the hearty manner in which the State Grangers, freeholders, and county engineers entered into the proceedings; in fact, if anything, it was more their affair than that of the autoists, who filled the part of hosts and listeners, and obtained much instruction thereby. It was to be expected that the trade would do its share towards making the event possible, for one of the unusual things was the transporting in autos of the delegates from all parts of the State, and 'tis safe to say that not a few of the Grangers had their first autoing experiences and secured impressions not unfavorable to motor-driven travel.

First came the 1907 convention of the Automobile Club of Springfield, Mass., with its excellent motto of "Good Roads and the Sane Use of Them"; next followed, in July last, the national assemblage at Buffalo, under A. A. A. auspices, and New Jersey has kept up the right kind of work with a few improvements that deserve special notice. There was no legislative talk at Atlantic City relating to the automobile itself; but the conventioners expressed themselves as being in favor of a law that would permit the visiting of the autoists of adjoining States, as long as they had gone through the registration necessity at home. That a decidedly more harmonious feeling exists, is a fact that admitted of no doubt at Atlantic City, and the understanding reached is an indication of joint results in the future. Supporting a common cause—the building and mantenance of up-to-date roads—the farmers and the autoists can bring about a system of highways which will put into the background those famous old Roman roads, and also the roads for which Napoleon gained so much credit. And the day is near at hand when the farmer will travel over those roads in an automobile, while "Old Dobbin" eats contentedly in the back lot, unannoyed by any regrets of the days which are gone.

* * *

WHY EVERY MAN SHOULD DRIVE HIS OWN CAR.

In Turkey and in Japan, we believe, no well-conducted gentleman would permit himself to be seen waltzing about a ballroom floor. Instead, when the mood comes upon him, he sends out round the corner and hires a troupe of dancers to disport themselves on his parlor floor. He leans back among the cushions and looks on. We copy the East in many ways; among other things, some of us hire chauffeurs to drive our automobiles.

This custom may arise either from laziness or from ignorance. It is possible that if the Turkish gentleman ever experienced the delights of gliding over a polished floor to the strains of the "Merry Widow," he would renounce for all time the traditions of his country and devote his fortune to the endowment of dancing academies. Likewise, if some of those automobile owners who now are content to loll in the tonneau, once took the wheel in their own hands for a fifty-mile spin on good macadam, the chauffeur would get his week's notice before the last dust cloud had settled.

Many persons, when it is suggested that they learn to drive their own cars, allege that they have no "mechanical bent." That excuse might have passed five years ago, but not to-day. Thousands of men draw both profit and enjoyment from their machines in chauffeurless bliss, who yet have only the vaguest of ideas as to what it is that purrs so gently under hood and footboards. Not that this state of mind is to be encouraged; but it does not often last. Many and many a time has the man who deplored his lack of mechanical inclination become a crank of the deepest dye, and even those who retain their mental perspective easily pick up the knowledge necessary to drive and care for the car. Really, there are few things simpler than the driving of an automobile. In a surprisingly short time it becomes as automatic as walking, and in no way detracts from the pleasures of the ride. This does not include learning to nurse the motor up each hill on high gear, or to drive sixty miles an hour on country roads, or to do acrobatic stunts in city traffic. But somehow, when an owner, ignorant of these accomplishments, has managed the car for a few months, the repair bills show a truly remarkable shrinkage.

JERSEY GRANGERS AND AUTOISTS TALK GOOD ROADS

ATLANTIC CITY, N. J., Sept. 26.—If the other State associations of the American Automobile Association will follow the plan of the Associated Automobile Clubs of New Jersey, they will quickly discover that the differences supposed to exist between the farmers and the automobilists are easily adjusted, for the needs of the two are certainly harmonious when it comes to the subject of good roads. And when farmer and autoist discuss the problems of highway construction and maintenance, they must inevitably touch upon the use of the roads, which means that both quickly recognize the rights of the other upon the aforesaid roads.

For two days members of the New Jersey State Grange, freeholders, and county engineers, and automobilists absorbed good roads from all points of view, the final summing up being of decided benefit and a generally better understanding all around. From various parts of the State the grangers, freeholders, and engineers were brought to Atlantic City in automobiles, thanks to the co-operation of the New Jersey Automobile Trade Association, with J. H. Wood as the chairman of transportation.

President W. C. Crosby, of the Associated Automobile Clubs, who presided during the greater part of the session, fell into the clutches of a speed trap while conveying three freeholders to the city by the sea. It might be mentioned that these three freeholders agreed thoroughly with the driver of the car that the speed limit was not being fractured to any alarming extent, and, incidentally, they obtained ideas on "trapping."

President Walter E. Edge and the other members of the Atlantic City Automobile Club did much to entertain the visitors, including "A Night in the Kitchen" at the Royal Palace Hotel, which entertainment Friday night was novel and very satisfactory up to a late hour.

Owing to illness, Governor Fort was unable to attend, and, therefore, his address did not follow the remarks of welcome, supplied by Mayor Stoy. But there were speakers in plenty, including some impromptu contributors, for there were general discussions after the fixed papers had been given.

Those Who Talked the Most.

The list of speakers included G. W. F. Gaunt, master of the New Jersey State Grange; J. M. Beldon, Essex County Road Drivers' Association; Frank Bergen, Elizabeth, N. J.; J. B. R. Smith, New Jersey Commissioner of Motor Vehicles; Deputy Road Commissioner R. D. Beeman, of Pennsylvania; James E. Owen, Newark, N. J.; George C. Diehl, Erie County Engineer, Buffalo, N. Y.; Deputy State Engineer Gettman, of New York State; Calvin Tompkins, New York City, and Allerton S. Cushman, acting director Bureau Public Roads, Department of Agriculture, Washington, D. C.

The more than 200 delegates applauded loudly when Granger Gaunt, before introducing the resolutions summing up the convention, said:

"We farmers are not opposed to the motor car; we realize that it is here to stay, and welcome both the automobile and its driver. We fully realize that it will revolutionize road transportation, and that it will be an important feature in making farm life more attractive. When the motor car becomes cheaper in price through more general use, the farmer will be the first to adopt it for business and pleasure. I stand ready to promise the automobilists that the grangers of this State will co-operate with them in bettering not only the condition of the roads but the lot of motorists, who, it appears, have been legislated against too severely."

Motor Vehicle Commissioner Smith in the course of his remarks said:

"Present road regulations have been rendered entirely inadequate by the great strides in development and improvement of vehicles. But if we expend out energy in antagonism, it is a waste of time. Our duty lies not in attempting to oppose the opposition, but rather in showing them that our stand is correct and converting their opposition into support. In connection with this, it is well to remember that the power and usefulness of the great motor vehicles when used properly are only equaled by its destructiveness and uselessness when used improperly."

Mayor Linkroum, of Hackensack, was one of the supplementary speakers, and his remarks found much favor. Said he:

Farmers Will Soon Have Autos.

"The farmer of the future will have a motor vehicle to convey his product to market. When he gets this—and I don't believe it will be a question of more than five years—he can just as well live 75 miles from New York as two. Such an improvement will, therefore, enhance the value of farm lands and our farms will be worth at least $200 an acre. Every dollar that the State of New Jersey expends for roads to-day will be gotten back in increased realty values. Within ten years I believe motor vehicles will be so reduced in price that the farmer can buy one to carry several tons for $1,500. Just as soon as this is possible, the horse will go. It's a fact that you can buy a fair runabout to-day for $400, and the price is decreasing all the time."

Col. Frederick Gilkyson, New Jersey State Commissioner of Public Roads, was the honorary guest of the convention, and in the absence of Governor Fort he read a paper prepared by the chief executive, who took occasion to refer most favorably to the proposed boulevard from Atlantic Highlands to Cape May.

Dr. Cushman made a stirring address, and in it asserted that the American farmer is paying annual mud taxes of $250,000,000.

Frank Bergen, of Elizabeth, took a fall out of the present system of improving the present crooked roads instead of straightening the highways between important points.

At the concluding session of the convention representatives of various road building and dust prevention concerns were given an opportunity to set forth the merits of that which they speak for. This feature was not entirely unattractive, and might well be incorporated in future gatherings of a like character.

In making a success of the convention none worked harder than Secretary H. A. Bonnell, of the State body, while other prominent autoists on hand were: George A. Post, president of the North Jersey Automobile Club; D. R. Anthony, Automobile Club of Hudson County; Frederick H. Elliott, secretary American Automobile Association; Dr. J. H. English, ex-president New Jersey Automobile and Motor Club; Jacob Mason, of the New Jersey Automobile Trade Association, and other notables.

Resolutions That Were Adopted.

These were the resolutions, passed unaminously, summing up the sentiment of the meaty convention:

WHEREAS, It is the universal opinion, and particularly of this convention, that improved highways are a valuable asset to any State in its development and progress; and

Whereas, such highways are growing more and more to be the channels of communication and intercourse as well as of trade, be it

Resolved, That it is the opinion of this convention that the materials, so abundantly provided by nature along the various highways, be utilized, so far as is practical, in the construction of such highways and the development of such highways system.

Resolved, That this convention and the organizations represented pledge their support, moral and active, in all movements tending towards the improvement of our highways and the development of our system of highways.

All Users of Highways Should Be Courteous.

Resolved, That it is unanimous sentiment of the representatives of the various organizations here present, that not only is it right and proper, but it is also most expedient and of vital importance to the interests represented that all users of the highways, and particularly automobilists, should be extremely careful and always keen and alert to observe strictly all the courtesies and decencies

of highway travel and should make it their constant aim to persuade, or if necessary, to compel those who are inclined to abuse their privileges upon the highways to conform to those rules of fair and reasonable conduct which already govern the vast majority.

Resolved, That the State Highway Department be requested to issue in pamphlet form information as to the proper and most improved method of the care of unimproved highways.

Resolved, That it is the unanimous sentiment that a good roads convention should be held once each year in New Jersey.

Favor National Aid in Roads.

WHEREAS, The farmers of the United States, through their principal organization, the National Grange Patrons of Husbandry, favor the enactment by Congress of legislation providing for Federal appropriations for public highway improvement and maintenance; and

Whereas, the policy of national aid for road improvement is of great importance to all users of our highways and should be established by appropriate legislation at the earliest possible date; therefore be it

Resolved, That this convention endorses the proposition that a portion of the national revenues should be annually appropriated in aid of the construction and maintenance of improved public roads, and urges Congress to enact legislation for this purpose.

In Favor of Reciprocal Registration.

WHEREAS, We are convinced that New Jersey has lost much from motorists of other States, because of our refusal to allow the use of our highways without the securing of a yearly license, has affected many business interests in the State, we believe that a duly restricted reciprocal arrangement with other States would be to the best interests of all; and

Whereas, It is noticeable that considerable neglect is apparent in keeping many of the improved roads of the State in proper order, we respectfully recommend that a pamphlet be prepared by the State authorities on the proper and scientific repair and maintenance of improved roads and be distributed among the county boards of freeholders, supervisors and other interested officials.

Fees and Fines for Road Maintenance.

WHEREAS, The State has received a considerable sum of money from motorists for license fees and fines, which was supposed to revert to the repair of improved roads, but which, for various causes, has not been entirely appropriated; and

Whereas, It is understood that there is some doubt whether by existing laws such income can be so appropriated; be it

Resolved, That it is wisdom of this convention that the issue should be made very clear and that the entire income from this source should be reappropriated to the repair of State highways outside incorporated city limits.

COMMERCIAL VEHICLES IN FRENCH ARMY MANEUVERS

PARIS, Sept. 25.—Two army corps, comprising 100,000 men have been dependent on the automobile for their daily supply of bread during the period of sixteen days that the annual army maneuvers have been in progress. Two much experience has been obtained in army automobile transport service for there to have been any possibility of the troops being delayed for lack of supplies, but there is still much to be learned in the operation of large numbers of motor vehicles in convoys.

With headquarters at Vierzon, in the center of France, the seventy automobiles were divided into convoys each having a load capacity of from 40 to 50 tons of provisions per day. The routine was for all vehicles to load up at night, make a daybreak start in convoys, reach the regimental headquarters 30 to 40 miles away, and there discharge their loads into the horse wagons distributing them to regiments at the fighting line.

Unlike previous years, the officer in charge of each convoy was provided with a fast automobile, enabling him to run up and down the line and assure himself that all the vehicles maintained their distances of 30 yards, and that there were no breakdowns on the road. In previous years the officer in charge has ridden on the leading vehicle, in which position he was able to set the pace, but had no opportunity of verifying the march of the following units.

The great majority of the military wagons were loaned to the authorities by manufacturers for the duration of the maneuvers only, the drivers being mechanics who were undergoing their period of military instruction. Only about twenty vehicles of various types were supplied by the War Department. The total number of commercial vehicles used during the maneuvers was seventy, this not including the fast touring cars employed by staff officers, or the motorcycles for carrying messages.

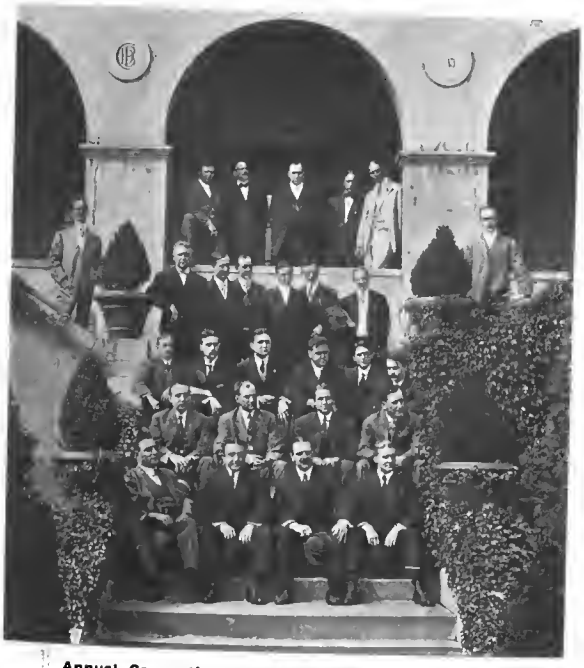
The most important units in the army automobile transport service were three Renard trains, each consisting of a tractor and three six-wheel trailers, two of them being open trucks and one a closed van. The Aries Company supplied the only other vehicles with trailers, the outfits being four-ton wagons trailing a two-wheel vehicle linked up close behind. The Empress Company of Paris put in fewer than ten trucks, varying in load carrying capacity from two to five tons. Berliet supplied five of their standard commercial vehicles, Peugeot and De Dion each had three, one of the latter being specially fitted up for the cycling brigade, and the following firms each supplied one or two vehicles: Cohandet, Latil front-drive, Panhard, Dietrich and Darracq-Serpollet.

During the time that the privately owned vehicles were under military orders they were supplied with fuel and oil, and granted an indemnity of 20 cents per horsepower per day. Each driver was entitled to an indemnity of 20 cents per day.

Commercial Vehicles Leaving Place de la Concorde, Paris, at the Start of the Recent Trials.

ANNUAL MEETING OF FORD MANAGERS.

The Ford Motor Company has made a point of annually assembling all their branch managers at the home office in order that the business of the past year may be discussed and new plans formulated. The convention of 1908 was called for September 15, 16 and 17, at which time the following members of the Ford clan answered to the roll call: H. B. White, Paris; B. M. Thornton, London; R. M. Lockwood, New York City, Foreign Department; F. R. Fox, Toronto; G. M. McGregor Walkerville; C. E. Fay, Boston; Gaston Plantiff, New York City; L. C. Block, Philadelphia; E. R. Stearns, Buffalo; M. D. Coate, Cleveland; H. Cunningham, Detroit; T. Hay, Chicago; W. C. Anderson, St. Louis; Charles Hendy, Denver; C. C. Meade, Kansas City; R. P. Rice, Seattle. The reports from all the agents were encouraging, especially about the prospects for 1909, and all managers pledged themselves to double the sales for the coming year. Besides the business meetings and time spent inspecting the new Ford product, model T touring car, each day found some form of entertainment provided which helped to make this annual gathering of the Ford interests the most successful meeting ever carried out.



Annual Convention of the Ford Branch Managers.

Top row, from left to right—John Dodge, John Anderson, Ed. Dodge, Frank Kulick, D. Gray; second row—L. A. Holmes, James C. Couzens, F. M. McGregor, F. R. Fox, Stanley Roberts, N. A. Hawkins, Henry Ford; third row—R. M. Lockwood, M. D. Coate, H. B. White, W. C. Anderson, Charles Hendy, H. B. Harper; fourth row—R. P. Rice, Thomas J. Hay, Roger Stearns, Harry Cunningham; bottom row—L. C. Block, Gaston Plantiff, C. E. Fay, C. C. Meade.

SALE OF TOLEDO POPE PLANT.

TOLEDO, O., Sept. 28.—Announcement has just been made that a deal has been practically closed whereby D. B. Apperson, Lynchburg, Va., becomes owner of the Toledo plant of Pope Syndicate, known as the Pope Motor Car Company, and, further, that arrangements have been made whereby the factory will be run to full capacity.

Mr. Apperson first tried to acquire the plant several months ago but negotiations fell through, and they have been renewed several times during the interim until now all details have been arranged. Just what settlement will be made with the creditors is unknown as yet. An offer was made of 33 1-3 per cent. some time ago, and only this week an offer was made of twice that amount, the offer coming from some Hartford, Conn., concern.

Iowa Business Men Trying Out 1909 Cadillac "Thirty."

SELLING METHODS BY A WESTERN AGENT.

All sorts of original schemes have been produced by automobile agents to get the prospective purchaser interested in the particular machine they were selling. The latest stunt in this line comes from Cedar Rapids, Ia., where the local agent for the Cadillac, G. H. Henderson, had a number of business men in line for the 1909 model Cadillac "Thirty," but had been unable to get a demonstrating car. These future owners becoming anxious to see the new product, the agent chartered a Pullman sleeper for Detroit and filled it with Cedar Rapids citizens. The next morning, on arrival in Detroit, the party was immediately taken to the Cadillac factory, where enough machines were supplied to hold all, and they were shown the city at the same time the new car was being demonstrated.

FAST TRIP OF THE AMERICAN TRAVELER.

INDIANAPOLIS, IND., Sept. 26.—A 1909 American of the "Traveler" type recently finished a remarkable 2,500-mile trip from Indianapolis to Boston and return. The trip was made under actual touring conditions, the car carrying four passengers, baggage, extra tires and complete road equipment. No attempt was made at long-distance speed records, although the car proved its ability to maintain speed remarkable for a machine weighted down as it was. Stops of a day—frequently two—were made in cities.

The route eastward led through Cincinnati, Pittsburg, Philadelphia and New York, and on the return through Albany, Buffalo and Cleveland. The trip between Johnstown, Pa., and Philadelphia—a stretch of rough mountain roads, crossing the highest ridge of the Alleghanies—was made in eleven and one-half hours, and from New York to Springfield, Mass., the distance was covered in eight hours and fifteen minutes without a stop. V. A. Longaker, president of the American Motor Car Company, and Fred I. Tave, the designer, alternated at the wheel.

Designer Tave (at wheel) and President Longaker (in rear seat) in the 1909 American Traveler.

News In General

E. W. Jordan and Party in Franklin Car on Hunting Trip in Colorado.

A Rocky Mountain Hunting Trip.—Even the humble burro is being replaced by the automobile. When E. W. Jordan, of Palisade, Colo., and a party of friends set out on a hunting trip into the heart of the Rockies they pressed into service a Franklin touring car. The run of forty-eight miles from Palisade to the hunting grounds was made with comparative ease, although over almost impassable roads, up and down steep mountainous grades; the last twelve miles led over a trail where no vehicle had ever before passed. In addition to the party of five, a complete outfit weighing about 500 pounds was taken along. A mountain lion and several wildcats and coyotes were bagged during the hunt.

Renault Trucks in America.—Paul Lacroix, general manager of the Renault Frères branch in New York, announces that the Renault trucks have met with such favor abroad that the company has decided to bring out two distinctly new types for 1909. The larger truck, with a carrying capacity of 3,500 pounds, will have a 14-20-horsepower four-cylinder engine, and the smaller truck a 10-14-horsepower two-cylinder engine of 2,000 pounds. The first American order has been placed with the New York *Herald* for seven of the larger type and one of the smaller, to use in their delivery service around the city.

Useful Advertising Signs.—During the summer a Chicago man while touring through New England lost his way one night near Springfield, Mass., and happening to notice some advertising signs near the road found that they had been put up by the Fisk Rubber Company, at Chicopee Falls, just out of Springfield. The tourist concluded that these signs would lead him into the city, which they did, as they are placed at frequent intervals on the trees and fences. This instance goes to show that such signs are not always as objectionable as some people think.

Studebaker Company Well Equipped.—The Studebaker Company has just completed a successful test with their new auto buggy and feel that with this added to their already large variety of motor vehicles, they are about the largest manufacturers of automobiles in the country. Dr. E. Ford, of the Studebaker Company, does not see how the product for the present can be improved upon, as they are now building everything in the gasoline line from the auto buggy to the finest of limousines; and in the electric field everything from the small runabout to the heaviest trucks. He seems to think that the only way to enlarge will be for the company to go into the airship business and bring out a complete line of dirigible balloons and aeroplanes. "However," says Dr. Ford, "until the demand for airships is more urgent than at the present time, we will probably concentrate on automobiles, but don't for a moment think that should the demand arise we will not be perfectly ready to build as complete a line of airships as we now have in automobiles."

Autos in Waterway Convention.—Ira M. Cobe, president of the Chicago Automobile Club, has sent out a call for 1,000 automobiles to be used on the afternoon of October 9 to show the waterway convention delegates around the city. The club sent out return postal cards to all the members, asking for the loan of their machines, and half the required number have already been promised. During the convention the Chicago Association of Commerce will have as its guests both William H. Taft and William J. Bryan.

Again the Farmer.—Word comes from Manchester, Conn., that a farmer in that vicinity has been showing his neighbors that to farm it in these times one should own an automobile. This individual acquired an old touring car which he was able to fix up in shape to do all that he demanded of it and this year when the potato crop was gathered the other farmers carted them to cellars for storage, while he went them one better and hauled his to Hartford in about the same time they were spending storing theirs away.

New Los Angeles-San Diego Record.—On September 23 L. D. Harvey, of the San Francisco branch of Thomas B. Jeffery & Company, lowered the record for the round trip of 335 miles between Los Angeles and San Diego by one hour and six minutes, making the distance in 11 hours and 22 minutes. Harvey used the same car, a Rambler model 34-A, that he used in his attempted record run between San Francisco and Los Angeles when he was held up for violating the speed laws.

Firestone Company's Clever Plan.—All sorts of methods have been resorted to by the tire manufacturers to produce a tire that would not skid, but it has been left to the Firestone Tire & Rubber Company, of Akron, O., to make use of a very clever scheme which they claim makes the nearest approach to a non-skid tire on the market. This new tire has the name "Firestone Non-skid" placed in raised letters around the body of the casing so that the name itself tends to prevent skidding.

New Continental List.—The Continental Caoutchouc Company has issued a booklet announcing a new schedule of prices, with considerable reductions from the former figures, which went into effect September 21. It also contains instructions for the use of "Ready-Flated" tires and the handling of the removable rims. The Continental motto is still "The greatest amount of mileage at the least tire expense."

Still Another Use for a Car.—With a view to economy of a great deal of time, the head gardener, Charles E. Murray, at Washington University, St. Louis, purchased a Ford roadster to take the place of a horse which he had been using for mowing the lawn. Hitching the mower on behind the machine he now does the work of mowing the 130 acres in a few hours, while the horse took at least two days.

Oakland Joins A. M. C. M. A.—The latest recruit to the membership of the American Motor Car Manufacturers' Association is the Oakland Motor Car Company, of Pontiac, Mich., makers of the Brush runabout. The officers of this company are: President, E. M. Murphy; vice-president, A. P. Brush, and sales manager J. B. Ecclestone, of Buffalo.

Continental Tires in India.—During the past three months a Stella car fitted with Continentals made a 5,000 mile tour in India, Malay Peninsula, China, and Java, over roads that had never been attempted before in an automobile. During the entire trip the tires were not touched once, rather a remarkable experience under any conditions.

Louisville Will Have Taxies.—The success of the taxicab in many of the large cities has led John Roche, W. E. Coldway and L. K. Delph to organize a company which will maintain a service in Louisville. The new firm, the Louisville Taxicab Company, has been incorporated with a capital stock of $5,000.

Auto Service to Briarcliff.—An automobile coach service has been inaugurated between the Manhattan Hotel, New York City, and Briarcliff Lodge, in Westchester County. It is intended that the service will be maintained throughout the Fall, two cars a day being run each way.

IN AND ABOUT THE AGENCIES.

Oldsmobile, Philadelphia.—The Olds Motor Works, heretofore represented by the Motor Shop, 317-319 North Broad street, Philadelphia, has established a branch house, which was put into operation October 1. A portion of the newly built structure at 231-233 North Broad street has been secured, and "Billy" Taylor, former factory representative of the Oldsmobile in the Philadelphia territory, has been appointed manager. This territory will include, besides Eastern Pennsylvania, all of Delaware, Maryland, Virginia, the District of Columbia, and the southern half of New Jersey. Manager Taylor has announced that it is the policy of his company to open sub-branches and agencies in all the principal cities of this territory, and that within a short time a regular factory branch will be established in Pittsburgh.

Pope-Hartford, New York.—The sale of Pope-Hartfords in New York City is now in new hands. The Pope Manufacturing Company has given the metropolitan agency for its product to the Pope-Hartford Auto Company. The new agency has leased and is now in possession of the former quarters of the Wayne, at 1853 Broadway, near Sixty-first street. At the head of the concern is B. E. Holt, a gentleman of wide commercial experience, though not, however, previously associated with the automobile business. His associates, B. E. Fincke and C. A. Dickson, respectively treasurer and secretary, are well known to the industry through prominent connection with the local trade at Newark, N. J.

G. & J.—The newly organized Berrodin Rubber Company has purchased the Philadelphia Auto Tire & Rubber Company and its Buffalo branch, and will continue the G. & J. agencies in both cities. The Berrodin Company is about to be incorporated.

"E. M. F.," Philadelphia.—Foss & Hughes, northeast corner of Broad and Race streets, have acquired the Philadelphia agency for the E. M. F.

PERSONAL TRADE MENTION.

W. J. Smith ("Rambler Bill," so-called from his long connection with Rambler interests in Philadelphia) startled the Quaker City "Automobile Row" last week by announcing his resignation as manager of the local branch of Thomas B. Jeffery & Co. He had been identified with that company for nearly fourteen years. Mr. Smith has signed a contract with the Maxwell-Briscoe Motor Company as district sales manager, with a distributing branch in Philadelphia and territory including Pennsylvania, Southern New Jersey, Delaware, Maryland, Virginia, West Virginia, Eastern Ohio, North Carolina, and the District of Columbia.

Martin Gillet Gill, Sr., one of the most prominent automobile dealers in Baltimore, Md., recently died of heart failure at his home on Ridgewood avenue, Roland Park. He was a member of the Motor Car Company, of which his son, Howard Gill, is the president. Mr. Gill was the owner of the first practical automobile to be brought to and operated in Baltimore. He also built and conducted the first auto garage in Baltimore, which was located on the site of the present motor car company at Maryland and Mount Royal avenues.

C. R. Mabley, who last year was manager of the importers' show at Madison Square Garden, and for many years identified with the automobile industry, is now associated with the American Motor Car Manufacturers' Association in connection with the show which opens in Grand Central Palace, New York City, on New Year's eve.

Richard Bacon, Jr., who, as manager of the Cleveland branch in Chicago, became well known to the trade, has been appointed sales manager of the Haynes Automobile Company, with headquarters at Kokomo, Ind. Mr. Bacon succeeds C. B. Warren who is now representing Stearns interests in Western territory.

Guy Vaughan, the well-known racing driver and mechanical expert of Wyckoff, Church & Partridge, New York City, will marry this week Miss Helen Knapp, a daughter of Mr. and Mrs. John A. Knapp, of New Rochelle.

A. N. Jervis, familiar to the trade as a writer of automobile topics, has again been appointed press agent of the automobile show to be held in Madison Square Garden under the auspices of the Licensed Association in January.

J. E. Garnett, of the Monarch Motor Car Company, who has been in charge of Wichita, Kan., branch, has been transferred to Kansas City, Mo., and R. R. Hayes appointed as his successor.

E. Percy Noel and Temple Emery, Jr., formerly engaged in automobile and trade journalism, have joined forces in the establishment of the Motor Press Bureau at 304 N. Fourth street, St. Louis, Mo.

C. F. Kimball, of C. P. Kimball & Co., Chicago, the well-known body-builders, is rapidly recovering from the recent illness which overtook him in Paris. He sailed for home September 26.

John Dorr, formerly with the Buick New York agency, is now assistant manager of the New York branch of the Everitt-Metzger-Flanders Company.

F. L. Thomas, who has been acting manager of the Franklin Company branch at 1450 Michigan avenue, Chicago, has been made permanent branch manager.

OMAHA HOUSE IN AUTO TRADE.

OMAHA, NEB., Sept. 28.—The Baum Iron Company, of this city, one of the largest and oldest concerns in the West engaged in the heavy hardware and carriage supply trade, has entered the automobile industry. It has just added to its business a new department, devoted exclusively to automobile supplies and accessories. At the head of the department is Eugene De Prez. Mr. De Prez is widely known to the motor car industry as the former secretary and manager of the Neustadt Automobile and Supply Company, of St. Louis.

The Baum Iron Company will give to its new department the advantage of branches in several cities and of a force of some 25 traveling salesmen, who will push the goods handled by the new department.

NEW TRADE PUBLICATIONS.

The Willard Storage Battery Company, Cleveland, O.—Electricity has occasionally been used for automobile headlights and sidelights, but hitherto always with carbon filament bulbs. The advent of the tungsten lamp now makes it possible to electrically light an automobile very economically, as this type consumes less than one-half the energy of the usual carbon lamp—that is, about 1 1-4 watts per candle-power to 3 to 3 1-2 watts for the carbon type. The filament in the low-voltage tungsten lamp is very strong and its shape is well adapted for use in automobile lamps; being made of heavy metal wire it will stand vibration without injury. Five sizes of tungsten lamp bulbs, ranging from 4 to 25 candle-power, are listed in the Willard Storage Battery Company's booklet, as well as two sizes of lighting batteries, three sizes for ignition, and a [illegible] wire, switches, etc.

Niles-Bement-Pond Company, New York City.—The results of fifty years' experience in the building of boring mills is shown in this catalogue, which describes the product of the Niles Tool Works, Hamilton, O. A dozen sizes of mills are listed, from the comparatively modest 30-inch size to monsters of 20-foot swing. The latter, of course, are hardly applicable to automobile construction. The small sizes are specially adapted to heavy chucking work and offer many advantages for the rapid production of duplicate parts. Many conveniences, such as quick-change positive gear feeds, automatic feed stops and quickly operating back gearing, have been provided for in the design. All parts have been proportioned to take full advantage of high-speed tool steels. The catalogue is illustrated by a large number of photographs of the various sizes and types of mills, and is a handsome piece of work.

The Winkley Company, Detroit, Mich.—Winkley oil hole covers and grease cups are known wherever automobiles are used and need no recommendation. A novelty, however, appears in the line of pressed metal grease cups. Many advantages are claimed for these over the ordinary types, as sheet metal permits lightness in construction with much greater strength. Castings are frequently spongy and are subject to flaws and sand holes. Pressed metal produces a perfect thread, both for the cap and for the stem. In placing them in position there is no danger of twisting off the stems and later no danger of their being broken off by accident while in use. The latest Winkley catalogue describes and lists these cups as well as the old lines of oiling devices.

F. A. Brownell Motor Company, Rochester, N. Y.—The Brownell automobile, marine and stationary motors are made in ten sizes of from 14 to 150 horse-power, with four, six and eight cylinders. There are two models, known as "plain top" and "overhead." The former has all valves in the head, actuated by push rods and walking beams from a camshaft in the usual position; but on the "overhead" type the camshaft is carried on the cylinder heads and actuates the valves directly. The Brownell catalogue describes and illustrates the various sizes and also gives a table of dimensions—a convenience many catalogue makers omit. The motors all appear to be solidly constructed and well adapted for heavy service.

Anderson Forge & Machine Company.—This company has just brought out a new catalogue containing over 500 detail drawings of forgings which are used in the automobile trade. They feel that this will help many manufacturers in their designing rooms and be a great time saver in making rough estimates for new work. A copy of this catalogue will be mailed to any manufacturer on request to the company in Detroit, Mich., or the National Sales Corporation, 296 Broadway, New York City.

Gram-Logan Motor Car Company, Bowling Green, O.—This company's folder gives advance information of three models of commercial cars—a three-ton truck, a one and one-half-ton truck and a delivery wagon. The large car is equipped with a 40-horse-power water-cooled motor and the two small cars with a 20-horsepower air-cooled one. Bodies are interchangeable, and several styles are carried in stock to select from.

National Brake and Clutch Company.—A new booklet has just been put out by the National Brake & Clutch Company, illustrating the many uses of the cork insert. They show cuts of fifty different ways in which the cork insert has been applied by them, and of special interest to the automobile user are their cork inserts for brakes and clutches as applied to the automobile.

New Goodrich Price List.—The B. F. Goodrich Company has issued its new price list of tires and rims for the year ending July 15, 1909. The company is also sending out with this new list a pamphlet, "The Light of the Glidden Tour," giving some of the experiences of the tourists who used Goodrich tires.

H. H. Franklin Mfg. Co.—This company has just issued its advance catalogue describing its 1909 models, the features including the auxiliary exhaust, concentric valves, spring suspension and transmission.

William F. Wright, Springfield, Mass.

The well-known vice-president of the Knox Automobile Company is an ardent autoist, and a driver of national reputation, having participated in several A. A. A. Tours for the Glidden Trophy.

INFORMATION FOR AUTO USERS

Auto and Yacht Fire Extinguisher.—Many occurrences are on record of serious damage being done to automobiles and yachts because of fires which might have been greatly reduced if the owners had had the use of some good chemical fire extinguisher. The Syracuse Chemical Fire Extinguisher Co., of Syracuse, N. Y., is selling a hand chemical extinguisher which it claims will instantly put out a gasoline or any other fire around an automobile. It has been designed especially for use on cars or yachts so that neither water nor rough roads can render it useless. Fig 1 shows the bottle holder which makes it unnecessary to run the risk of burning the hands while recharging, and takes less time. This company claims to have eliminated in this new model all of the unreliable and impractical features which many chemical extinguishers possessed. There is no loose stopper to become corroded, no bottle to break, or plunger to operate; any of which might render the extinguisher unreliable. The holder, shown in Fig. 2, being adjustable, can be readily fitted to any car or yacht.

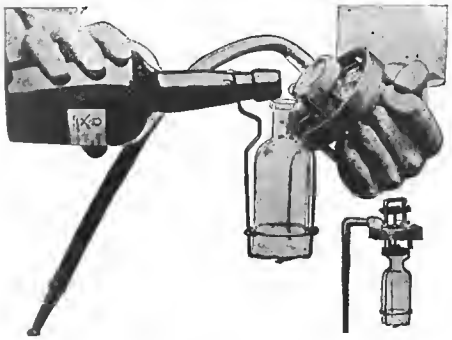


FIG. 1—SHOWING METHOD OF FILLING.

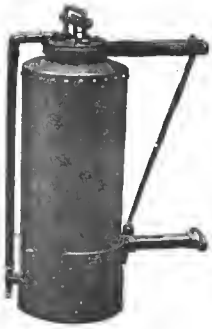


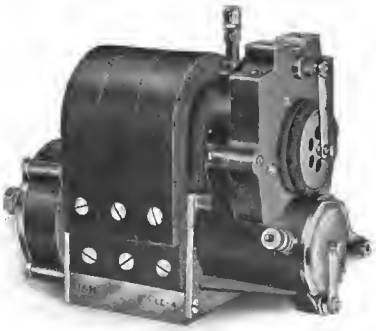
FIG. 2—EXTINGUISHER AND BRACKET.

New Gasolene Can.—The Dover Stamping & Manufacturing Company, of Cambridge, Mass., has brought out an extra heavy galvanized can especially made for gasoline, which it claims has features making it very adaptable to the use of automobile owners. The distinctive point about this can is the facility with which the gasoline may be poured without spilling, as the spout is made purposely very large. A tight screw cap is not only provided on the top of the can, but one is fitted on the end of the spout to prevent evaporation.

NEW DOVER CAN.

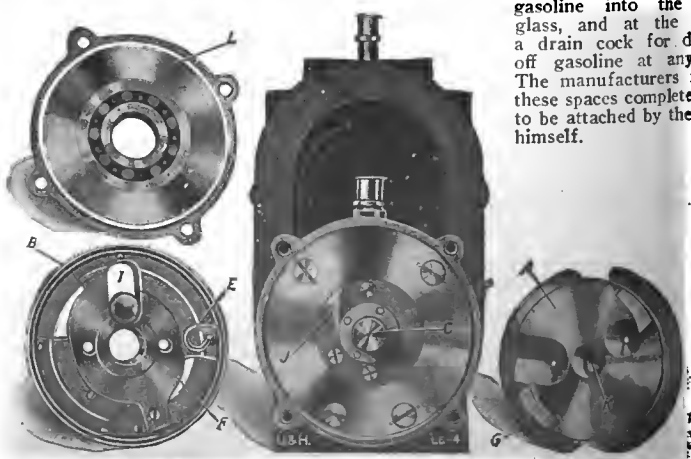
Unterberg and Helme Magneto.—The magneto shown herewith, manufactured by Unterberg and Helme, Durlach, Germany, is distinguished by a unique starting device which appears to obviate the difficulties often experienced in using a magneto without an accessory battery system. With this device, the speed of rotation for the necessary half-turn of the starting crank has no effect whatever upon the quality of the spark produced, and back-firing is made impossible by an automatic retard of the timing.

The illustration shows the starting device disassembled. *L* is the cover plate.



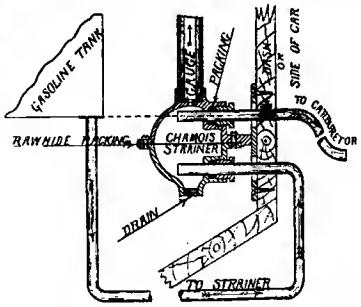
U. & H. MAGNETO COMPLETE.

A, the steel driving disc, has been slipped off of the armature shaft *C*, on which it is normally free to turn; the bronze disc *B*, secured to the armature shaft, has also been dismounted. This disc *B* carries a coil spring around its circumference, one end being attached to *B* and the other to a pin on *A*; thus *B* and the armature are forced to follow *A*. The steel ball *H* is loose in the slot *I*. This ball projects behind *B*, and, as *B* rotates, strikes the fixed cam *J*. The other side of the ball is held up firmly against the obstruction by the disc *A*, so that *B* is blocked and cannot turn further. *A*, however, continues to rotate, putting the connecting spring under an increased tension, until the radial depression in *A* comes opposite the steel ball. The ball immediately drops into the depression, freeing *B*, which turns with a sudden jerk until it catches up with *A* again. Of course, the armature is arranged so that the short, swift movement of *B* carries it over the sparking point, and generates as strong a current as if the magneto was turning at its maximum speed. The arrangement is also such that this sparking point is past the dead center of the crank. When the motor reaches a speed of 60 r. p. m., the ball is held by centrifugal force in the outer part of the slot *I*, and no longer engages the cam *J*. The drive is then direct and constant. The magneto itself is of the usual type with double armature winding, generating a high-tension current without the use of a separate spark coil. The timer, condenser and distributor are mounted on the rear end, and, with a few exceptions, follow the standard design. The "U. & H." magneto is handled in this country by the J. S. Bretz Company, Times Building, New York.



STARTING DEVICE OF UNTERBERG & HELME MAGNETO, DISASSEMBLED.

Gauge and Strainer Combined.—The Central Brass and Fixture Company, of Springfield, O., has placed on the market the Puritan combined gasoline gauge and strainer, which should be useful to owners of automobiles as a means of keeping their gasoline supply to the carbureter free from dirt and water, besides showing the driver at all times the amount of gasoline left in the tank. The gauge glass has a red ball which floats on the top of the column of gasoline showing the height in the tank at a glance, as the length of the gauge is made according to the depth of the tank on each car. In the sectional drawing is shown a general arrangement with gasoline connections made. This clearly shows the route of the gasoline from the tank, through the chamois strainer, and on to the carbureter. At the top of the strainer compartment is a small opening for the gasoline into the gauge glass, and at the bottom a drain cock for drawing off gasoline at any time. The manufacturers furnish these spaces complete, ready to be attached by the owner himself.



PURITAN GAUGE AND STRAINER.

VOL. XIX NEW YORK—THURSDAY, OCTOBER 8, 1908—CHICAGO No. 15

THE AUTOMOBILE

BRITAIN'S 4-INCH RACE WON BY NAPIER-BUILT CAR

DOUGLAS, ISLE OF MAN, Sept. 24.—The "four-inch" race, run off here to-day, was won by Watson on a Hutton car—a product of the Napier factory. Second and third places were taken by Darracqs, driven respectively by Lee Guiness and George. The three leaders all finished within five minutes.

This race was the fourth of the Tourist Trophy contests and is also, in all probability, the last road racing event to be held in the United Kingdom. Its name was derived from the fact that the cylinder bore was limited to 4 inches for a four-cylinder engine, and all the competing cars, save a touring Rover entered by its owner, have their cylinders bored out to the limit.

As might be expected, there is big variation in the lengths of stroke adopted; the smallest, 4¾ inches, being found on the Calthorpes, while the longest known stroke is the 7⅛ inches of the Darracqs. The reason for uncertainty in this last respect is that the stroke of the winning Hutton is not publicly known, but it is said to be between 7 and 8 inches. Curiously enough, the winning car was not considered to stand as good a chance as its two stable companions, which had several special features.

The winner's time was 6 hrs. 43 min. 5 sec. for the 340 miles, an average of 50¼ miles per hour. This may seem disappointingly low in view of the fact that some of the cars, and particularly the Huttons, have shown themselves capable of almost 90 miles per hour on a straight run, but it must be remembered that the Isle of Man circuit is not at all adapted for fast work and that its 38 miles includes 10 miles of climbing, 4 miles of which averages 1 in 10.

The dangers of the course for high speed work were well shown up in practice spins. Of the more serious mishaps, some five days ago the Coventry Humber ran off the road at a corner and the resulting damage was not fully repaired in time, thus preventing the realization of the excellent performance expected from this car. Similarly, much disappointment was caused by the overturning of Cupper's Metallurgique car on Monday last. The mechanic was badly hurt, but both Cupper and the car were patched up to run in the race. These Metallurgique cars, three of which were entered, are admittedly the most powerful in the race, and reliable power tests at the factory showed that the

One of the Most Picturesque Parts of the Isle of Man Course, Ballig Bridge, on the Way to Glen Helen.

Weighing-in the Arrol-Johnson, Driven by Resta.

maximum output touched 100 horsepower at 2,200 revolutions—surely an extraordinary power for so small an engine.

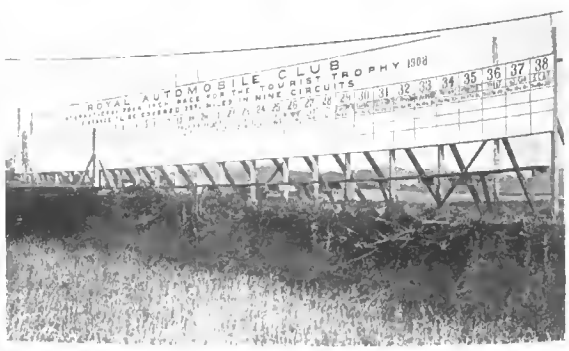
The weather to-day has been as good as could be desired, and the recent rains effectually laid all dust. Of the forty cars originally entered, the two special Rovers could not be completed in time, and the better of the two Thornycrofts was smashed up at Ramsey late last night. The two Berliets failed to materialize this morning, and hence but thirty-five cars faced the starter at Willaston at 9 o'clock. Of these cars, fifteen were foreign built and the remainder British. No American car was entered; in fact, the sole American entries in all four races were the two Whites which ran in the 1905 event.

Although numbered "2," Watson's victorious Hutton was the first to be sent off, for the touring Rover, which had been allotted first place, was by kind consent of its owner relegated to the tail end of the procession—so that it might cause as little obstruction as possible. At half-minute intervals the remainder were sent off, after which the big crowd settled down to watch for the first arrival.

Victorious Hutton Not Fastest on First Round.

Forty-five minutes after the start Watson came past, followed closely by the Arrol-Johnston, driven by Roberts, and Guiness'

General View of the Start and Finish.



Big Score Board of the Four-inch Race.

No. 20 Metallurgique Leading Past Hillsbury.

Darracq, the order of starting being maintained. The fastest time for this lap was made by George, whose Darracq averaged just 50 miles an hour. Subsequent laps showed an all-round increase of speed and the winner's average for the whole distance showed better than the fastest performance for lap one.

Of the unfortunates, Stirling quickly ran his Hutton into a wall at Ballacraine, luckily without personal injury; and in similar manner the Picard Pictet tried conclusions with the Quarter bridge. Fortunately this car was, like the majority of its fellow competitors, fitted with Rudge-Whitworth detachable wire wheels, and by fitting two new wheels and repairing a front spring, it was soon on the road again.

At the end of the second and third rounds Watson still held his own, but on the fourth lap both the Arrol-Johnston and George's Darracq finally managed to pass him after so long a struggle. The other two Arrol-Johnstons had both dropped out, one through engine trouble, and the second, driven by Resta,

with a seized-up clutch. Warwick Wright's Metallurgique was also withdrawn.

The end of the fifth lap showed that Watson had dropped back again to fourth place, Tuck's Beeston Humber taking third position. Seeing how matters stood, the Liverpool man did his utmost, and at the end of the sixth circuit had won back to second place, coming between Guiness and George on the so-consistent Darracqs.

Meanwhile the list of troubles had increased. Lewis's Deasy broke its crankshaft, but a new one was refitted on the road—though surely a crankshaft is rather an unusual "spare" to carry in a race. The De Dion made rather a bad début, and a seized-up clutch caused Stocks to give up at Ramsey. Both Beeston Humbers also withdrew.

No. 7 Metallurgique Pursued by No. 15 Hutton, the Winning Car.

At the commencement of the eighth lap Watson led, with the two Darracqs not half a minute behind. These three cars continually passed and repassed until, as the final round was commenced, it was seen, with great excitement, that George was two minutes ahead of Watson, who, in turn, had two minutes' advantage over Guiness.

At 3:44 a car was signaled and quickly Watson drew up at the finishing line—not yet certain of victory. The minutes passed and Guiness' Darracq arrived, nearly five minutes behind Watson.

George was still absent when the elapsed time had run out and Watson was declared the winner. Just as the result was posted up the missing Darracq roared up, taking second place, two minutes behind the winning car. It appears that at Glen Helen George found his carbureter on fire, and six valuable minutes were lost in repairing the damage done.

Although record time was made from this point to the finish, it was impossible for the Darracq to win back so much, and so, for a fourth time, a British car has been victorious in the Tourist Trophy race.

Truly George deserves to be called unlucky, for in the race of two years ago his Argyll finished second but was disqualified through loss of ballast on road.

The fourth to finish was the Calthorpe, driven by Porter—the lowest-powered car in the race—at an average of 46 miles an hour. The only others to complete before the time limit were the second Thornycroft and the Vinot.

THE AUTO CYCLE RACE.

DOUGLAS, I. O. M., Sept. 22.—The third annual race held by the Auto Cycle Club of Great Britain for a miniature of the Tourist Trophy, was won today by Marshall on a 3 1-2-horsepower Triumph. The competitors were divided into two sections, the single-cylinder class having 15 starters, and the multicylinder class 20 starters. A 16-mile course was covered 10 times. The winner's time was 4 hours, 4 minutes and 50 seconds, an average of 38 1-2 miles per hour. The race was singularly devoid of accidents. It is interesting to note that all the competing machines except three were fitted with high-tension magneto systems.

BRITISH TRADE TIRED OF RACING.

DOUGLAS, I. O. M., Sept. 23.—Two interesting races were on the program for to-day: the contest for the Henry Edmunds trophy over a 4-mile climb up Snaefell, and the Graphic trophy straightaway race of 5 miles near Foxdale. Both of these events were open to standard touring cars of power not exceeding 40 horsepower by R. A. C. rating, but as only four entries were received for each race the R. A. C. decided to cancel them.

The opinion, both of the general public and of the representative trade bodies, is entirely against the continuance of road events, whether in the form of races or of timed hill climbs, and hence it is extremely probable that to-morrow's Tourist trophy contest will be the last of its kind to be held.

No. 12 Deasy and No. 14 S. C. A. T. Rounding Kirkmichael Corner.

Down This Homestretch Past the Paddock to the Finish the Drivers Made Their Grandstand Plays.

SIMPLEX SCORES IN BRIGHTON'S BRUTAL "24" HOUR

AFTER one of the fiereest fought struggles in the whole history of long-distance track racing, and most destructive to men and machines as well, a 50-hoursepower, four-cylinder Simplex, entered by the Palmer & Singer Manufacturing Company, and driven by George Robertson and Frank Leseault, evolved as winner of the 24-hour race promoted by the Motor Racing Association at the Brighton Beach mile course last Friday and Saturday. A 50-horsepower, six-cylinder Lozier, nominated by Harry A. Lozier and piloted by Michener, Mulford and Cobe, which won the 24-hour race run a fortnight before over the same course, was second. A 72-horsepower, six-cylinder Thomas Flyer, named by Harry S. Houpt Company, with Roberts, Salzman and Winters for its crew, finished third.

The three first cars all beat the previous world's record for a mile track of 1,107 miles, set up by Mulford and Cobe and the Lozier "six" in the former race—the Simplex, with a score of 1,177 miles and an average of 49 miles an hour; the Lozier, with 1,125 miles and 46.83 average, and the Thomas with 46.45 average. The following cars showed hour scores of 50 miles and over: Simplex, 57; Stearns, 57; Renault, 55; Lozier, 54; Zust, 53; Thomas "Six," 52; Fiat, 52; Cleveland, 50; Allen-Kingston, 50.

A 45-horsepower Renault, entered by Paul LaCroix and driven by Louis Strang and Charles Basle, the latter a racing pilot several years ago for H. L. Bowden's then famous Mercedes, figured prominently in the race for 17 hours, but was forced to retire the next hour owing to a broken connecting rod. It evolved as the one imminently serious disputant of the premiership of the Simplex in the race. It led, in fact, from the third to the twelfth hour, both inclusive, and incidentally took unto itself new records at all these points. At the end of the hour previous to its withdrawal it had a score of 851 miles, as against the previous record of 705 miles in 17 hours, with an average per hour of 50 miles.

In the battle of the tires, the Michelin carried off first honors, second place falling to the Continental, and the third car having for its equipment the Diamond.

Among those who like to see the honors of the racing game well distributed and perseverance receive at last its reward, the victory of the Simplex was a popular one. Charles A. Singer, its entrant, was warmly congratulated. He has been a liberal supporter of racing, but until this race had not landed the winner of an important event. The Simplex was originally the creation of Smith & Mabley. It has participated in one or more Vanderbilt Cup contests, and was a contender in the Briarcliff. Not a little of the ill-luck of the game, heretofore, has been its lot and kept from it a noteworthy victory. Its performance in the present race was most impressive. It ran like clockwork and seemed to have no end of speed.

Robertson and Simplex.

The performances of Louis Strang and George Robertson, who are to have prominent mounts in the Vanderbilt, the former on Paul LaCroix's Renault and the latter at the wheel of A. L. Riker's Locomobile, were closely watched. Strang lost none of the reputation he made as winner of the Savannah and Briarcliff cups by his consistent work, and Robertson displayed, in addition to his determined fighting qualities, a continence that he has not shown before and is highly encouraging for his future success at the wheel. George Salzman and Charles Basle, too, other Vanderbilt drivers, piloted their mounts in heady fashion. It was more than once remarked by those that witnessed Montague Roberts' magnificent stern chase of the Lozier that the Vanderbilt would be a gainer were he once more to be at the wheel of one of its cars. By way of a pardonable grandstand play, Barney Oldfield was at the wheel of the luckless Stearns for an hour or two. Barney, however, had done some long-distance driving before in the Briarcliff.

One fatality in the killing of a special policeman in the pursuit of his duty on the track and an unusual number of rather serious accidents to the drivers, marred the sport. In the third hour of the race, T. F. Fickett, a special policeman employed by the promoters, started to cross the track from the field stand to the paddock, some say in pursuit of some boys encroaching on the track. Four cars were approaching almost abreast from around the turn at the head of the homestretch. According to Robertson's immediate report of the affair to the officials, Fickett was first struck by him, then by the Stearns, and then by the Cleveland. He was taken to the hospital tent, where it was found that he had both arms and the right leg fractured, four ribs broken, and concussion of the brain. He died the next afternoon at the Coney Island Reception Hospital. Upon his death Robertson was placed under technical arrest, though not put in custody.

In trying to dodge Fickett, the Simplex swerved into the Stearns and broke the left front frame member. Pieces were sent for to New York and inserted so that the

patched-up car appeared again on the track early the next morning. The frame was further patched up to enable Oldfield to drive it for an hour or two on Saturday evening. The car had been making a good showing, holding fourth place in both the first and second hours, with scores of 50 and 100 miles.

Smashing of Machines Began Early.

The smashing of machines had begun, however, before the race had even started. At dusk following the afternoon sprints, several cars came out on the course for trial spins. The Garford had forced its way on the track against rules, so says Tom Moore, and was ordered by him back into the paddock. It turned and ran up the course toward the camp's entrance gate. Just then Michener, who was rounding the turn with the four-cylinder Lozier at full speed, ran into the Garford. The results of the collision made it impossible for either car to start in the races. The frame and rear axle of the Lozier were sprung and its left rear wheel torn off. Two wheels were smashed on the Garford and its frame was put out of commission.

A long list of mishaps followed to other cars and men that will bear detailing at once that the story of the race itself may be reached and told without such unpleasant interpolations. The accidents must be told, however, since they account for practically only half of the 12 starters in reality surviving the struggle to the end.

At the 190th mile, the Lozier with Harry Cobe at its wheel, was hit in the rear by a pursuing car. The collision turned the Lozier around and headed it for the fence; one beam broke the steering wheel, while another beam went between Cobe's legs, and through the cushion, dented the gas tank and bent the frame in front. In a couple of minutes Cobe was again under way, driving with but two spindles in his steering wheel.

Between 2 and 3 o'clock on Saturday morning there was a perfect holocaust of disasters. At 2:35 o'clock Renault, No. 14, with Julian Bloch at the wheel, at the first turn had a tire blowout, which hurled the car into the fence and upset it. The upset and a fire that resulted made of the car almost a heap of junk. Bloch was rather badly burned about the face in attempting to quell the flames. Five minutes later the Zust in trying to avoid the Renault wreck blew out a tire and ran into the fence opposite. It was so badly battered that a new front axle, a new wheel and a new radiator had to be put in. When it was thought to be ready to run, the magneto was found to be wrong, and the motor could not be timed.

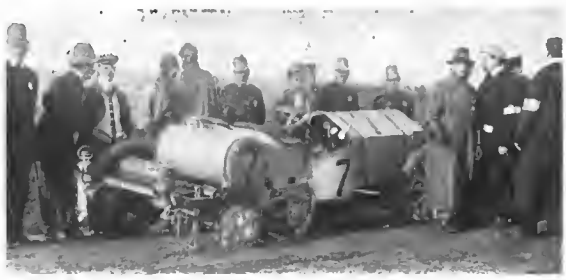
About this time the Cleveland also hit the fence 25 feet beyond. The fence rail passed through the radiator and the rear twin cylinders were so badly injured that a new motor and radiator had to be inserted. Then, after running for three miles, trouble developed in the transmission. A new one was put in.

The Fiat had to retire at 3:30 A. M., owing to the connecting rod breaking, through lack of oil. Practically the same cause put the Strang Renault out of the race, also with a broken connecting rod. The temptation to run without replenishing fuel proved fatal, it will be remembered, in the last race to the Allen-Kingston and the Simplex. Mr. LaCroix, however, says that the Renault's oil feed broke.

At 7:15 A. M. the Acme, at the upper turn, had a right rear tire blow out and skidded in the sand into the fence. It smashed a wheel and so deranged the motor that the car was withdrawn. At 8:15 A. M. the six-cylinder Thomas's right rear tire blew out and turned the car through the hole in the fence made by the Lozier. Though the post was cut off, the machine was not injured. Roberts jumped to the seat and relieved Salzman.

On Saturday afternoon the Garford, having replaced the entire rear construction broken in its collision with the Lozier before the race started, returned for a run to the finish, but soon had to retire owing to its clutch having burned out.

Toward the close of the race the hiatus of accidents was brought to an end by the Zust, whose pilot was T. W. Post, formerly connected with the automobile tire industry and known to the old cycle contingent as cycling editor of the Brooklyn *Eagle*. It ran into the fence on the backstretch. Charles Brown, the



Acme After Its Drive Through the Fence.

mechanic, was thrown out and had his arm broken. Mechanics and drivers of other cars, which dove through the fence, received scratches, cuts, and bruises that do not need cataloguing.

The race, though far bigger, finer, and more filled with thrills than the first one, was not the money winner that the initial meet was. The attendance at the curtain-raising sprints on Friday afternoon and during the early afternoon of Saturday suffered badly by comparison with that at the last meet. Nor was the opening night attendance nearly so large. The weather, however, had much to do with the latter, for an icy wind that chilled all hands to the marrow swept across the field from the north. Still there was a good, big crowd of six or seven thousand well wrapped in coats, sweaters, and furs on hand. On

Down and Out Renault Looked Forlorn.

Tire Repairing Interested Camp Hangers-on.

Fire Brigade Alert for Hurry Call or Photo.

Some of the Faces the Flashlight Revealed.

Robertson and Boys That Helped Him Win.

Saturday the weather moderated and a crowd of perhaps 12,000 saw the wind up.

The M. R. A. made noteworthy improvements in the excellent arrangements of the meet. There was much added lighting. A praiseworthy taximeter scoring system was installed that showed the standing of the cars at all times. Each car had its own board and scorer, the figures being changed by "spools." More beds than before were installed in the dormitory. It is respectfully suggested, however, to the management that in future admission badges to the "sleeping" room be confined to the officials and newspaper men, for whose comfort the dormitory was arranged at considerable expense, and that its privileges be denied to scorers and minor officials, made up largely of young men preferring a noisy night of fun to the sleep sought by the tired judges, timers, and scribes, rendered impossible by the noisy antics of the effervescent youths aforesaid.

On the pretense of awaiting repairs to the Garford that would make it possible for Mr. Hurlbert's car to compete, the start of the 24-hour race was delayed until 8:45 o'clock. At the shriek of the signaling horn, George Robertson made a quick jump and had sneaked across to the pole on the first turn with the Simplex before the other pilots knew just what had happened. He raced down the backstretch in the lead, followed by "Monty" Roberts in the Thomas "Six" and Laurent in the Stearns. This trio not only finished the first lap in this order, but kept it for 5 miles. Then Roberts sprinted to the fore and led at 10 miles in 11:32. In the early sprinting, however, the Simplex had been showing miles in 58 seconds. Roberts led at 20 miles, also in 22:23. Then Robertson went to the head and got a firm grip on the lead, and in the meanwhile Strang had worked through the ruck into second place. The simplex made 25 miles in 27:33 and 50 miles in 54:31.

Order at End of First Hour

The order at the end of the first hours was: Simplex, Strang, Lozier, Stearns, Roberts, Fiat. The same order exactly ruled at the end of the second hour. There was a gap of 12 miles between the leaders and the pursuing bunch. Thus early the chaff had been winnowed from the wheat, and the likely leaders separated from those with but one or two exceptions with any chances of figuring otherwise than as mere "also rans" in such fast company as this pacemaking sixtette.

The promises of a knockout pace that should dispose of the weaker brethren early in the struggle were, indeed, being fulfilled. Robertson set a terrific clip with the Simplex, 55 miles the first hour and 107 the second, as against 52 and 101, the former figures. All this time Strang was hanging on like grim death with the Renault, with the record-holding and victorious Lozier chasing swiftly at their heels.

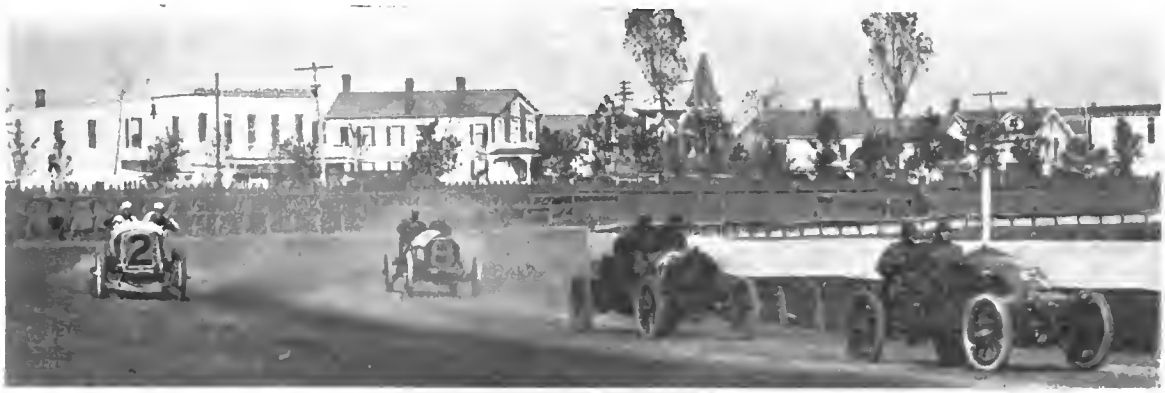
In the third hour Strang went to the fore, and the Lozier got by the Simplex also. The next hour, however, the Simplex became the runner up and "Monty" Roberts supplanted Mulford as pursuer. It was a stubborn all night and early morning struggle with the Renault setting the pace for the Simplex, and the Lozier and Thomas alternating as pursuers. In the fifth hour the Fiat had forced itself into third place, and was beginning to look dangerous, when its connecting-rod calamity came and put it out of the running.

The thirteenth hour proved a luckless one for Strang, for while the Renault was in camp, the Simplex secured the lead that it never lost to the finish. From that point on the French car got no nearer the American machine than 3 miles; was at times 10 miles behind, but, as a rule, but five measly little miles to the bad that a stop for a tire or oil could wipe out.

The excitement of the race between Renault and Simplex and Strang and Robertson was at its height, when the Renault, in the eighteenth hour, turned into the paddock and word came that its connecting rod had broken and that it was out of the race altogether. The disappointment of the crowd was keen and the sympathy for the popular French sportsman was general. Then attention was turned to an equally stubborn duel that was in progress between Michener and Mulford in the Lozier and Roberts and Winter in the Thomas for second and third money, for Robertson had an hour margin and only had to keep up a

Night Scene from Grandstand Was Weird.

Taximeter Boards Showed Each



Renault Leading Simplex Into Homestretch Pursued by Thomas on the Pole and Lozier Outside.

fairly fast clip and take no chances to win out comparatively easy. This he did, but with the exit of the Renault and the slowing down of the Simplex all hopes of a 1,200 miles score and a 50 miles an hour average were abandoned. Up to the withdrawal of the Renault the pace set had been a bit faster than a half century an hour.

Roberts in endeavoring to close the 10-mile gap that separated the Thomas from the Lozier furnished the excitement of the wind up. His game chase made him a favorite with the crowd. Roberts got as close as four miles to Michener in the twenty-third hour. It was this desperate sprinting to catch up, however, that put him ahead of the old figures and in the trio of record breakers. A half an hour before the finish the referee ordered the Stearns and Zust off the course under the rule permitting the barring of contestants that had no chance to win and might interfere with or endanger the other contestants.

"Barn-Stormers" Won Short Events.

The feature race of Friday afternoon's curtain raising program was the 50-mile free-for-all. It had for starters the Barney Oldfield-Charley Soules combination, driving six and four-cylinder Stearns stock cars, respectively; Harry Kirkpatrick, Hotchkiss; Harry Roux, Mercedes; Steinwitz, Mercedes, and Ray Howard, Palmer & Singer. It was an easy one-two win for the "barn-stormers" and the Stearns, Barney winning in the excellent time of 50:42, with Soules second in 51:34 4-5; Roux third in 52:06, and the Palmer & Singer fourth in 54:46.

That Oldfield had lost none of his popularity with New Yorkers was evidenced by his cordial greeting when he appeared with a linen duster, the inevitable cigar, and his Stearns "six" to face the starter for the five miles for six-cylinder cars. He greatly pleased the grandstand by making a runaway of it by a quarter of a mile in 5:20 2-5, despite the fact that he mistook the checkered last lap banner for the finish flag and had to be told to go on when he slowed down. His time for four miles was 3:52. Harry Kirkpatrick in a Hotchkiss stock car was second, and Ray Howard in a Palmer & Singer third.

The Fiat pair had a try against Christie's mile track record of 54 seconds. George Robertson, in the Tornado, scored 58 seconds and Ralph De Palma succeeded on the Cyclone with a mile in 52 2-5 seconds. In a match between these two at 10 miles, the Cyclone was cut loose and won in 9:45, the Tornado having stopped in the fourth mile owing to a broken gasoline lead.

PENALIZATIONS FIRST DAY OF CHICAGO RUN.

CHICAGO, Oct. 6.—The 1,000 miles four-day reliability test of the Chicago Motor Club started this morning, and at the close of the first day's run of 262 miles over the Kenosha-Janesville-Rochelle circuit thirteen of the seventeen contesting cars still had perfect scores. Of the four that were penalized, the Maxwell two-cylinder touring car experienced cabureter trouble, water getting into the mixture, which cost 24 points to correct. The No. 3 Mason was penalized 66 points for oiler trouble, while the Studebaker touring car lost a pin out of its differential, causing it to be laid up at Janesville. Its penalty has not as yet been announced, but it is the intention to start again to-morrow. The Reliable Dayton buggy had not reported at a late hour to-night. The other thirteen cars have perfect scores as follows: No. 4 Mason, Apperson Model O, Midland, Pierce Arrow roadster, Haynes roadster, Premier roadster, Rainier, the two Whites, Franklin, Haynes touring car, Marmon, and Pierce Arrow big six touring car.

Two of the entrants were scratched, the Knox because of not having a driver and the Premier touring car because it did not arrive in time from Kansas City.

Paul LaCroix, Strang (head turned), Basle (left).

There Were Very Busy Times in Tiretown.

THE TABULAR STORY OF THE 24-HOUR RACE, HELD OCTOBER 1-2, AT BRIGHTON BEACH RACE TRACK.

No.	CAR	Drivers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
6	SIMPLEX	Robertson, Lescault.	55	107	143	198	255	302	350	401	454	508	559	612	658	710	761	810	856	903	949	992	1,041	1,086	1,131	1,177
2	LOZIER	Mulford, Cobe, Mitchener	51	101	153	191	228	279	329	381	414	468	513	562	611	650	702	742	791	840	888	933	981	1,031	1,075	1,125
8	THOMAS	Roberts, Winter, Salzman.	49	99	151	193	235	286	329	374	423	470	516	565	600	650	690	738	786	837	877	928	973	1,022	1,071	1,115
11	ALLEN-KINGSTON	Lanwell, Rippigill, Pepperday.	42	74	91	94	128	148	185	237	287	328	372	413	451	495	533	579	615	660	710	750	796	827	874	907
9	CLEVELAND	Chevrolet, Miller, McMann.	43	88	137	187	231	263	263	263	263	266	266	266	267	311	347	361	392	437	475	513	543	583	625	632
5	RENAULT	Strang, Basle.	54	105	158	211	265	305	356	408	455	506	558	613	655	705	758	802	857	888	Broke connect'g rod; withdrew					
4	STEARNS	Laurent, Marquis, Oldfield.	50	100	131	131	131	131	131	131	184	241	254	254	255	268	268	268	268	287	339	383	429	480	509	519
15	ZUST	Post and Natien.	46	52	82	121	174	217	217	217	217	217	217	217	217	217	228	232	269	285	308	333	370	396	421	
7	ACME	Patschke and Rodgers.	35	62	84	109	143	184	204	233	245	293	309	Withdrawn												
3	FIAT	De Palma, Capra and Hawley.	48	99	167	185	237	283	303	Broke connecting rod; withdrawn																
14	RENAULT	Bloch and Clement.	43	83	123	176	221	255	Overturned and destroyed by fire																	
12	THOMAS	Martin and Blanchard	35	35	70	116	158	177	179	188	205	206	Withdrawn													
10	GARFORD	Young and Doty.														43	47	Withdrawn								
	Old Record		52	101	146	193	245	294	332	380	423	465	515	563	616	664	706	755	803	849	883	928	972	1016	1,060	1,107

THE STRUGGLE FOR THE LEAD.

Hour	First	Miles	Second	Miles	Third	Miles	Former Record
1	Simplex	55	Renault	54	Lozier	51	52
2	Simplex	107	Renault	105	Lozier	101	101
3	Renault	158	Lozier	153	Simplex	143	146
4	Renault	211	Simplex	198	Thomas	193	193
5	Renault	265	Simplex	255	Fiat	237	245
6	Renault	305	Simplex	297	Thomas	286	294
7	Renault	356	Simplex	345	Thomas	329	332
8	Renault	408	Simplex	396	Lozier	381	380
9	Renault	455	Simplex	449	Thomas	423	423
10	Renault	506	Simplex	503	Thomas	470	465
11	Renault	558	Simplex	554	Thomas	516	513
12	Renault	613	Simplex	607	Thomas	565	565
13	Simplex	658	Renault	655	Lozier	611	616
14	Simplex	710	Renault	705	Lozier	650	664
15	Simplex	761	Renault	758	Lozier	702	705
16	Simplex	810	Renault	802	Lozier	742	755
17	Simplex	856	Renault	851	Lozier	791	803
18	Simplex	903	Renault	888	Lozier	840	840
19	Simplex	949	Lozier	888	Thomas	877	883
20	Simplex	992	Lozier	933	Thomas	923	928
21	Simplex	1,041	Lozier	981	Thomas	973	972
22	Simplex	1,086	Lozier	1 031	Thomas	1,022	1,016
23	Simplex	1,131	Lozier	1,075	Thomas	1,071	1,060
24	Simplex	1,177	Lozier	1,125	Thomas	1,115	1,107

HOW NEW 24-HOUR RECORD SLATE READS.

Hour	New Record		Old Record
1	55	Simplex, Robertson and Lescault	52
2	107	Simplex, Robertson and Lescault	101
3	158	Renault, Strang and Basle	146
4	211	Renault, Strang and Basle	193
5	265	Renault, Strang and Basle	245
6	305	Renault, Strang and Basle	294
7	356	Renault, Strang and Basle	332
8	408	Renault, Strang and Basle	380
9	455	Renault, Strang and Basle	423
10	508	Simplex, Robertson and Lescault	465
11	559	Simplex, Robertson and Lescault	515
12	613	Renault, Strang and Basle	565
13	658	Simplex, Robertson and Lescault	616
14	710	Simplex, Robertson and Lescault	664
15	761	Simplex, Robertson and Lescault	706
16	810	Simplex, Robertson and Lescault	755
17	856	Simplex, Robertson and Lescault	803
18	903	Simplex, Robertson and Lescault	849
19	949	Simplex, Robertson and Lescault	883
20	992	Simplex, Robertson and Lescault	928
21	1,041	Simplex, Robertson and Lescault	972
22	1,086	Simplex, Robertson and Lescault	1,016
23	1,131	Simplex, Robertson and Lescault	1,060
24	1,177	Simplex, Robertson and Lescault	1,107

BAY STATE ENDURANCE TIE FINALLY CALLED A DRAW

BOSTON, Oct. 3.—The endurance test of the Bay State Automobile Association, which started as a twenty-four hour endurance run, but which developed into a contest of over 1,600 miles and the hardest test ever given motor cars in this country, was concluded Thursday evening when the three cars, which for eight days had survived every task set for them and had retained perfect scores to the end, were withdrawn by their owners with the consent of the committee.

These cars are the Franklin and Studebaker tourers and the Shawmut runabout. The Franklin was driven by Carris of Transcontinental and Glidden tour fame, and Burns; the Studebaker by W. G. Jones, and the Shawmut by Harold Church. When they were withdrawn they had covered 1,607 miles without an adjustment, repair, or replacement, and had made every control on time, their scheduled running time being about ninety hours and their actual running time considerably less. Having given this demonstration of reliability, the owners of the cars, the Franklin Automobile Company, Studebaker Automobile Company, and Shawmut Motor Company, respectively, felt that it was useless to continue the contest, as the cars were in first-class shape and apparently could keep on indefinitely. The committee had already set up the running schedule to the limit allowed by law and had selected as bad roads as it was possible to find, including mountain grades, sandy and rough going; the cars had been driven in blinding dust and in thick mud, and there seemed nothing more within reason that they could be called upon to accomplish.

Of the twenty-one cars that started, sixteen were penalized, but the penalties in only five cases can be chargable to structural or mechanical trouble. In the other cases such things as dust clogging the carbureter, gasoline failing to feed on a long hill or owing to the position of the cars caused motors to stall and points to be scored against the machines. Two cars were put out by broken wheels, one of the Overlands suffering this misfortune near the end of the original run, and F. E. Wing's Glidden tour Marmon being put out by this mishap in Monday's run-off to Portland and return. The Stevens-Duryea went down because of a leaky gasoline connection, and the Chalmers-Detroit had transmission trouble. The Oldsmobile broke a spring in the first run-off. The Pierce and the Fosdick Lancia were eliminated by failure of the gasoline to supply the carbureter owing to the angle at which the cars happened to be standing, and the Hilliard Lancia and the Rambler were penalized for stalled engines due to dust in the carhureter. Two Overlands and a Buick did not finish the first day's run, and another Buick was put out of business by a collision with a horse. The Cadillac and the Corbin were late at controls and lost points in this way, the lateness being caused by the drivers losing their way in the dark. The Shawmut touring car was also scored against for lateness, the car having been stuck in sand. The Buick and Reo runabouts, which finished perfect in the original run, did not participate in the run-off.

The trophy has not yet been awarded, and ways and means are now under consideration for properly recognizing the merit of the three machines which went through with perfect scores.

Preparations are complete for the great balloon race for the Gordon Bennett trophy, which will be held in Berlin, Germany, October 11, under the auspices of the Berlin Aero Society. It is expected Emperor William and the Crown Prince will be present.

HORSE-POWER RATINGS OF AUTOMOBILE MOTORS*

By THOS. J. FAY, President Society of Automobile Engineers.

IN finishing cylinders, if the stroke is great, the bore will be conical, since finishing to a considerable depth in a blind hole evolves conical results. Many claim to be able to finish to a fraction of a thousandth, even if the stroke is very long; doubtless they can, but not at a cost allowable in practice. There are a large number of parts in an automobile, and the cost of the finished product must be very low in comparison. The design of each part must be such that the work can be done by men available in the open market. Leakage is more of a detriment in the long stroke motor, because there is more time in which the mixture may escape. If the long stroke motor is more difficult to finish, the chances of leakage are greater. It follows, therefore, that the initial (apparent) advantage is, to some extent, at any rate, a theory. It is not the purpose here to make predictions, but to call attention to the two sides of the matters to be considered by the designer before he commits himself, especially in view of the fact that once the design of a motor is crystallized, it is then too late to make any substantial change.

Regarding Torque vs. Speed.

For a given horsepower, the motor in which the torque is a maximum should prove the most attractive, for reasons as follows:

(a) It will then be the more difficult to "stall" the motor.

(b) The motor will run slower without "laboring."

(c) The motor will start with a greater load at a slower speed.

(d) The motor will be more capable of extracting the car out of high resistance portions of the roadways.

Torque is the product of piston area times mean effective pressure; horsepower is the product of torque and speed. It is plain then that piston area is of the greatest importance, under such conditions, and even if the stroke is short, the torque will not diminish until the speed is quite high, whereas the advantages enumerated are all with the lower range of speeds where the effect of diminishing torque will not be noticed.

As between a short-stroke motor with a considerable piston area and a long-stroke motor with a diminished piston area, the short-stroke motor is the superior of the two in automobile work from these points of view, at any rate. For the same power, the short-stroke motor must be of the greatest piston diameter, hence of the maximum torque (at the lower speed range). If the bore of the short-stroke motor is greater for a given power, then the valves can be of greater area and the mixture losses will be a minimum.

The result is, all things considered, that the long-stroke motor shows its disadvantages only where the bore is the same for both, and the author is not in a position to make the k values in his formula differ, in view of a difference in stroke, on a basis as shown in the curve, Fig. 1, since designers are not compelled to accept the conditions there set down, i. e., the same bore for both the long- and the short-stroke motors, considering a given horsepower rating. One point more: torque is not limited by speed, as we are accustomed to regard it, unintentionally perhaps, although the torque does diminish as the speed increases. It is the tortuous passages and the obstruction offered by the valves that does more to suppress the torque than any other influence. Were the valves of the same area as the pistons, and the manifolds so short and straight as to offer no appreciable resistance to the flow of the gases, the torque would remain nearly constant at all speeds. On the other hand, it is the automobile that makes the least noise, that is the most desirable. If the valves are quite large, have strong springs, and the compression is good, speed and noise are then companions. Noise, in itself, is rather a bad phenomenon, for the very good reason that the mechanical losses in machinery are indicated by heat and noise.

There is a limit to the sizes of the valves then, hence the torque will fall off at the higher speeds, not because of the speed *per se*, but for reasons incident to the construction of the valves. On the other hand, there are limits of speed, one of which is the diminishing torque, another being the ills of the inertia component. Were it possible to so design a motor as to eliminate the weight of the moving parts, there would be no limit to the speed on that account. The speed would still be limited, however, by the falling torque, due to the inability of the explosive mixture to follow quickly receding pistons. The largest valve diameter found in practice is one-half the diameter of the piston, while the smallest equal one-quarter the piston diameter. This is a vast difference in practice, if we but take into account the fact that the area varies as the square of the diameter.

Influence of the Valve Lift.

If a valve lifts the equivalent of one-quarter of its own diameter (flat seat), the area of the opening will be approximately equal to the area of the valve, while if the valve is half the piston diameter, its area will be equal to one-quarter the piston area. But valves do not lift the equivalent of their own diameter, nor are most of them flat-seated. The actual lift is seldom more than ⅛-inch, at the most. The larger the valves, the more the lift is diminished to obviate noise, so it would seem the available space through which the mixture must "sift" is but small, indeed. Fortunately, the mixture is under pressure, or impelled by a vacuum, which amounts to the same thing. The exhaust is under pressure (terminal pressure) and in the four-cycle motor the piston sweeps the gases out. These are matters that influence the torque, hence the horsepower rating, and, it is more to the point to give them close attention than it is to browse over formulæ, with a view to predicting the probable commercial rating of a motor; it is the motor that must deliver the power rather than the formula. The time the valves are open is also of the greatest importance, no less than the relations of opening and closing to the travel of the piston. If the valves are small in proportion, and the lift limited, to afford the best possible results, the time of actual opening is the only remaining loop hole through which the designer can mount to success. An inlet valve, for illustration, should open at the beginning of the suction stroke, and should remain open until the piston compresses the mixture sufficiently to render the sum of the opposing pressures equal to zero. On the other hand, the exhaust valve should open toward the end of the expansion stroke (not at the end), at the point where to be rid of the exhaust gases is of greater importance than the balance of the work represented

*Continued from page 467 of "The Automobile," October 1.

CORRECTION.—On page 430, issue of THE AUTOMOBILE, September 24, the last bracketed part for the horsepower formula, reads:

$$\left(\frac{H.P. \times 33{,}000}{2\pi R P}\right)$$

It should read:

$$\left(\frac{H.P. \times 33{,}000}{2\pi R S}\right)$$

The equals sign in the formula for R is incomplete. As printed it reads minus.

On page 465, issue of THE AUTOMOBILE, October 1, the horsepower formula (Prony brake) reads thus:

$$H.P. = \frac{2RSP}{33{,}000}$$

It should read:

$$H.P. = \frac{2\pi RSP}{33{,}000}$$

T. J. F.

by the terminal pressure. The exhaust valve should stay open as long as possible, which is up to the time of the inlet's opening.

Few, indeed, are the motors in which this question is so thoroughly disposed of as to require no further attention. The timing of the spark is also open to investigation. As the speed increases, the spark must be advanced, else the propagation of the flame will be ill timed, the mean effective pressure will be lowered, and the power of the motor will be reduced, as indicated by a falling off of the torque.

Fig. 3 shows the phenomenon due to late spark, in which it will be observed the pressure not only fell off, but the flame propogation was delayed. This decreases the power, in that the torque will be much diminished. When this condition obtains in a motor, it is persistent, and, as a rule, due to defective equipment, so that the operator is rarely able to so "tune up" as to eliminate the defect; the sparking equipment is more likely not what it ought to be.

Harmonizing the Car and Its Motor.

There are two conditions to be satisfied as respects the motor in conjunction with the car. The motor must be equal to the occasion when the car is running at its maximum speed, and it must have sufficient flexibility to enable the operator to run the car at speeds below the maximum Involving the maximum

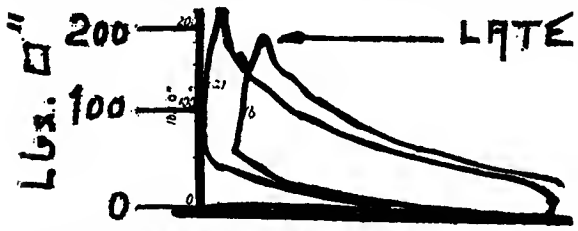


Fig. 3—Showing a late spark resulting in a reduction of torque, hence of power as well. (This drawing was originally the work of W. Watson, presented in a paper before the Royal Automobile Club of Great Britain, February 21, 1907.)

speed, the gear ratio must be that which will end in a zero equation, if the power of the motor is indicated, plus the resistance of the car. This is not always so, and the result is the motor is not allowed to do as well as it really could under better conditions.

If the — horsepower of the car equals the + horsepower of the motor, the gear ratio will be the ratio of the crankshaft to the driven wheels of the car when the car is moving as fast as it can impelled by the motor delivering its highest power. Taking this as a statement of fact, it is easy enough to devise a formula to satisfy the conditions of a zero equation.

If we say $-\text{H.P.} = \dfrac{2\pi R' S\left(\left(\frac{33{,}000}{88}\right)\left(\frac{H.P.'}{Q}\right)\right)}{M \quad 33{,}000}$, in which:

$-H.P.$ = the resistance offered by the car in horsepower.
R' = the radius of the driven wheel in feet.
S = the speed in r.p.m. of the driven wheels.
Q = the mechanical efficiency of the transmission system.
M = the speed of the car in miles per hour.
*$H.P.'$ = (in brackets of the formula) the horsepower as measured at the contact of the tires and road bed.

The (plus) horsepower of the motor must equal the requirement as above set down, and for convenience, it will be well to distort the same formula, with a view to deriving the horsepower of the motor, thus:

$$+H.P. = \frac{2\pi RSP}{33{,}000}, \text{ in which}$$

$H.P.$ = the actual delivered horsepower of the motor.
R = the radius in feet = unity.
S = the angular velocity of the crankshaft in r.p.m.
P = torque.

*H.P.' includes wind resistance. This horsepower, plus the loss in transmission, must equal the horsepower of the motor, as measured by a dynamometer.

By way of an example, it will be something to set down the known values before arranging them, thus: $\frac{33{,}000}{88} = 375$

$Q = 80$ per cent; it may be higher or lower in different cars, but the value taken will serve in general.
$2\pi = 6.28$.
$R' = 1.5$; R' depends on the sizes of wheels used on cars; in this case 36-inch wheels will be taken.
$S = 560.5$ revolutions per minute, for 60 miles per hour.
$H.P.' = 36$.

With the known values thus available, it will be an easy matter to insert them in the formula and solve for horsepower thus:

$$H.P. = \frac{6.28 \times 1.5 \times 560 \times \left(\frac{375 \times \left(\frac{36}{80}\right)}{60}\right)}{33{,}000} = 45.$$

For the motor we would have:

$$+H.P. = \frac{2\pi RSP}{33{,}000} = 45 \text{ horsepower, in which}$$

$2 = 6.28$.
R = unity = 1 foot.
$S = 1{,}120$.

$$P = \frac{45 \times 33{,}000}{6.28 \times 1{,}120} = 206.8 +$$

The gear ratio would have to be as 560 : 1,120, or as 1 : 2, in order to permit the motor to run at its best speed with the car making 60 miles per hour. Any other gear ratio would defeat the plan, whether up or down, since there would be only one speed at which the motor would deliver its maximum power, which it would have to do to equal horsepower = 45.

The second condition to be satisfied takes into account the flexibility of the motor, in order that the car may run at less than the highest speed the motor is capable of dictating, under conditions of a correct gear ratio. This second condition is rarely, if ever, satisfied in practice, for if it were there would only have to be one set (couple) of gears in the transmission. In practice it is considered the highest attainment if the motor will enable the driver to negotiate all road conditions on the high gear. The maximum flexibility of the motor would then be in evidence and this would be a condition, induced by a motor characteristic showing increasing torque with decreasing speed.

Some General Motor Considerations.

Here is evidence of the desirability of a motor of maximum bore and minimum stroke. The torque would tend to hold in proportion to the square of the bore and would recede with the speed, after a certain speed is attained. Of course, on the boulevards, flexibility would be assured, irrespective of the shape of the torque curve, since the torque would not be lower at the lower speeds than that of the highest power speed. The car takes power greater than in direct proportion to speed on a given level road and this fact would assure flexibility on good level roads. It is when it becomes necessary to go slower in bad roads that the higher torque is a necessity and it is the motor with the maximum bore for the power that will be the most likely to favor this road condition.

Thus far it has not been necessary to specifically consider the number of cylinders best suited to the problem. Indeed, it is a fact that the abstract question is independent of the number of cylinders. In practice, however, it has been found that the weight efficiency is influenced by the number of cylinders. It is purely a matter of weight efficiency then that influences the cylinder question, barring the matter of the space available plus style and trade considerations. As a purely engineering proposition, the number of cylinders to use will be the number that will afford the highest weight efficiency, coupled with a practical thermal efficiency. There is no chance of any motor, of any number of cylinders, being superior merely because it has so and so many cylinders. The "I-saw-it-first" idea is not an engineering proposition at all, nor can it have any bearing on the situation in the long run.

If a single-cylinder will suffice for the purpose, it is the best to adopt, but if it will not, then to use two cylinders would be the natural sequence. Should the situation demand more than two cylinders, it is to four that one should look, then to six, and finally to eight. With a single-cylinder motor must be included a flywheel of a weight capable of completing the cycle, and when the excess of flywheel weight amounts to more than the second cylinder, it is the two-cylinder motor that is wanted. Likewise, as the power requirement is advanced, the conditions naturally indicate more cylinders.

As the number of cylinders increase, the torque impulses are multiplied, and as they spread around the circle, the need of flywheel effect gradually recedes until with enough cylinders the flywheel ceases to be of value, except while the motor is being started, during which time the flywheel serves a useful purpose, since the initial effort, in the absence of any flywheel effect, would be beyond the average motorist. To entirely do away with the flywheel, neglecting the question of cranking, is a matter not worth discussing, because more than eight cylinders would be required and the author is willing to go on record as responsible for the prediction against the chances of any one ever wanting a greater number.

The argument in favor of a plurality of cylinders is as simple as can be. A ship will make headway in a steady wind that cannot be made in a series of gusts of wind. It will stand up under all the air that goes to make a hurricane if delivered at a steady rate, but not otherwise. Likewise, the mastery of the energy stored in the fuel is best managed in small increments, multiplying the number of impulses to the maximum, bearing in mind that complicated mechanisms are to be avoided, when possible to do so. It would be vain to jump to the conclusion that this simple way of viewing the matter argues for multiple cylinders at once and for all. The facts are quite opposite. If in a multiple cylinder motor certain sizes of cylinders will serve the purpose well, any less number of cylinders of the same size will serve the purpose equally well if power requirement is reduced in direct proportion to reduction in number of cylinders.

As the number of cylinders is reduced, the flywheel effect must be increased, and the proper guide is the weight efficiency on roads such as America affords; in lands where fuel is high and road making has been advanced, it is the thermal efficiency that should remain uppermost in the mind's eye of the designer. It might be said a single cylinder could be so large as to preclude the chance of rendering the motion steady, which would be quite true in the absence of enough flywheel effect to complete the cycle within the limits of "speed fluctuation," called steady when referring to a motor with a plurality of cylinders.

There is no device available that will so readily and so evenly part with its energy as a rotating mass in the form of a flywheel. Overlapping impulses, as in a multiple cylinder motor, is a crude device in comparison with flywheel effect. The disadvantage of the flywheel lies in the weight required to do the work, and weight efficiency is of such great moment as to preclude the use of sufficient mass to render it feasible to use cylinders large in bore and small in number beyond certain limits.

Some single-cylinder cars are not as steady as cars with multiple cylinders, but only because the flywheel effect is inadequate for the purpose. In such cars, the flywheel weight is stinted, and properly so, since the cars are heavy enough as they are. They merely emphasize the question of the desirability of weight efficiency.

[In later issues, the influence of the carbureter, the fuel, and the electrical problems entering into the subject will be separately discussed.]

S. A. E. TO MAINTAIN EMPLOYMENT BUREAU

AMONG numerous other activities, the Society of Automobile Engineers will henceforth maintain an information bureau for the mutual benefit of members seeking positions and of the manufacturers in need of additions to their technical staffs. As a matter of fact, American automobile manufacturers are now very largely represented in the membership, so that the innovation will result in benefiting members both ways. The names and qualifications of those seeking new positions will be kept on file, as will also the needs of makers desirous of filling vacancies in their engineering departments, or of employing additional men, and both will in future be published in the quarterly transactions of the Society.

In view of the peculiar status of the automobile industry where a supply of competent technical help is concerned, due to the extremely rapid growth of automobile manufacturing in this country, there is little doubt that this move on the part of the Society should meet with the approval and support of the industry as a whole. With the active co-operation of manufacturers, whether members of the Society or not, and of those members who are interested in this, there appears to be no reason why it cannot be put on a practical working basis in a very short space of time, and the results will undoubtedly be of a nature to benefit all concerned, as well as to increase the already rapidly growing influence of the Society of Automobile Engineers.

AUSTRIA'S AUTOMOBILE TRADE FIGURES.

The Austrian Chamber of Commerce has just published the statistics for the first six months of 1908, which show a general improvement, both in the import and export trade, the former being especially on the increase. The figures for the period stated are 5,575,180 kroners this year, as against the same time in 1907, when the value of goods imported came to 3,260,400 kroners. Germany leads the way in cars de luxe, commercial vehicles and engines, supplying 141 of the cars to France's 90 and Italy's 64. The remaining 22 are divided between the United States, England and Switzerland. The German Empire imported 14 commercial vehicles and 74 motor cycles into Austria.

The export trade shows figures to the extent of 1,930,750 kroners, a rise of 242,650 kroners in comparison with the first half of 1907. No business was done with the United States as far as cars are concerned, Germany again being the best customer, but four motor cycles were forwarded to America. The motor cycle export shows an astonishingly small total, only 80 in all, and yet cycle building is one of Austria's strong points.

SPECIAL LOCOMOBILE FIRE FIGHTERS.

BRIDGEPORT, Conn., Oct. 5.—They are now building at the Locomobile factory no less than three special fire-fighting automobiles for service in various New England towns. One of these is a hose-wagon for the town of Waterbury, Conn., designed to have a capacity of 1,000 feet of 3-inch hose beside its crew, and a second is to be a combination chemical extinguisher, ordered for service in New Bedford, Mass. Both are being built on the regular 40-horsepower Locomobile chassis with special bodies designed to fit the requirements of fire-fighting service. A most unusual feature to be found on them is the fitting of 40 by 6-inch Fisk tires on the rear, and 40 by 5½-inch tires on the front wheels, the equipment being the same in each case. The third car is being built for the city of Bridgeport, which already has several cars of the same make in its fire department.

As the Austrian Emperor has just given his sanction, the Austrian motor liability law will come into force November 1. This measure will have a grave bearing on the home industry.

USEFUL THINGS FOR THE AUTOIST TO KNOW

A LOW-TENSION magneto of early type may frequently be considerably improved by rewinding the armature with fine wire to give a higher voltage when cranking. The following directions will apply to such a case, and also to rewinding when the armature coil becomes damaged. In case it is desired to wind with

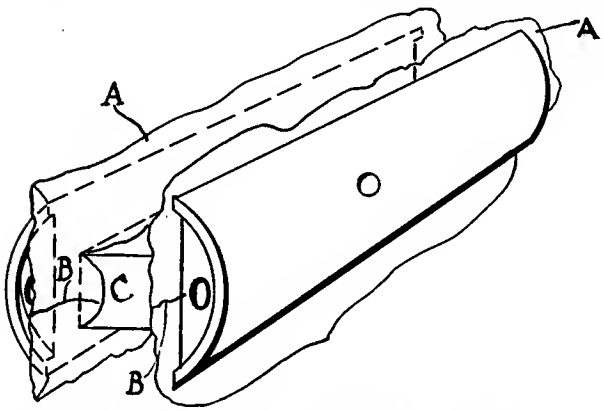


Fig. 1.—Showing the first step in insulating A A, pieces of muslin, cut to B B to enable them to be slipped over core. C, central body of core.

smaller wire, the wire already on the armature should be stripped clean of insulation and calipered with a micrometer to determine its size. If it is an even size—28 or 30—it is probable that the next smaller even size will be suitable. The new wire should not be less than half the sectional area of the old, and about two-thirds more will probably be right. After the old wire has been stripped off, new insulation will be necessary next to the core. Fig. 1 shows the first step in insulating. First the inner end of the wire is soldered to the core, and then pieces of muslin, A A, are slipped over the core, being cut at one point, B B, to enable this to be done. Three such pieces are put next to each pole, with the cuts B coming alternately at opposite ends. Next a strip of muslin slightly wider than the core is wound tightly three or four times around the central body C of the core. After binding it with thread all the muslin is shellacked.

The winding process is best done in a lathe; see Fig. 2, in which the dotted lines indicate the dead center. The core is rotated backward, by crossing the lathe belt if necessary, and the wire is wound as smoothly as practicable, like thread on a

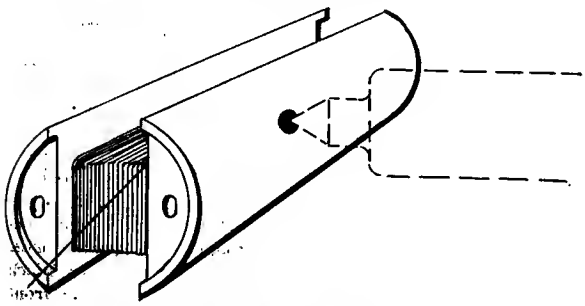


Fig. 2.—Showing the winding process with use of lathe. Dotted line indicates the dead center.

spool. To hold the wire while it is being wound on, take a piece of cloth folded three or four times around the four fingers of the hand, and give the wire a loose turn around the cloth. If the armature is unprovided with centers these can easily be supplied. At intervals stop winding and hammer the partly completed coil flat by a block of wood and a light hammer. When the coil is completed twist the outer end two or three times around the next turn to prevent it from flying downward by centrifugal force—see Fig. 3. Next the whole coil is bound with thin, hard brass wire wound into the shallow groove turned in the armature poles for that purpose. Under this wire binding, next to the coil, is an insulating strip of mica A, Fig. 3, and a thin strip of copper—commutator copper is best—B is slipped under the binding wire and its ends doubled over to prevent the brass wire from spreading. The piece B and the wire binding are soldered at several points, and particular care is taken to solder the ends of the binding wire fast. When this has been done the final operation is to saturate the coil thoroughly with shellac, giving it all it will take, and baking it for several hours in an oven.

It is essential that the binding wires be drawn as tight as possible. This is best accomplished by replacing the armature shafts and centering them in a lathe, after which tension may be put on the binding wire as it is wound on by running it between two fibre blocks squeezed together in the tool post.

Strong Spark for Carbureter Adjustment.

When a new carbureter has been put on an engine it is sometimes difficult to get the mixture near enough right to start the engine, which is obviously the first step in obtaining correct adjustment. This may be particularly the case when ignition is by an old-style magneto, since these frequently do not generate a sufficient spark unless the motor is cranked quite smartly. If the ignition is by make-and-break it is easy to disconnect the

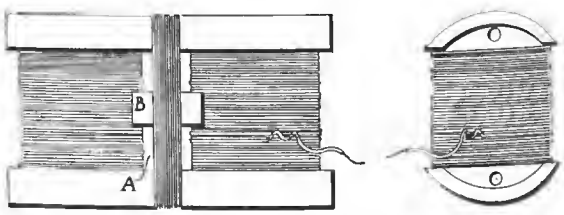


Fig. 3.—Showing method of fastening wire to prevent flying downward by centrifugal force.

magneto and substitute a battery and gas lighting coil. It is only necessary to disconnect the wire from the switch to the bus bar to which the ignitors are connected, and connect the battery wire in its place. Six or eight fresh dry cells and a coil will give a hot enough spark to ignite almost anything. The negative terminal of the battery is, of course, to be grounded. It does not take much running to exhaust the battery, therefore the magneto should be switched in as soon as the engine starts.

Possible Cause of Knocking.

Knocking, which occurs once per revolution or every other revolution in an engine whose bearings are known to be tight, may be traced to the magneto, or more probably to the coupling through which the magneto is driven. Knocking at this point can generally be felt by touching the magneto bearing and the bearing of the magneto driving gear. Occasionally it may be found that the driving end of the armature shaft is loose in the bronze disc which is screwed to the armature core. Such looseness may easily be remedied by rocking the shaft when it can be removed from the engine. Nothing is more jarring to the well-trained mechanical ear than a persistent noise emanating from the motor, and it is frequently the case that it is all out of proportion to the seriousness of its cause, which may be utterly trivial, though the result is such as to make the experienced driver fear that a disaster may be imminent. A loose accessory often causes suspicion to be cast on the motor.

THE LIMITATIONS OF THE UNIVERSAL JOINT

By H. VANDERBEEK.

ALTHOUGH the universal joint, originally known as Hooke's coupling, has been widely used for feed mechanisms on machine tools, for driving drill spindles, and in agricultural machinery, it was not generally employed for the transmission of considerable powers until the advent of the bevel-gear-driven-rear-axle automobile. Fundamentally, the universal joint is a device for the transmission of rotary motion between two shafts

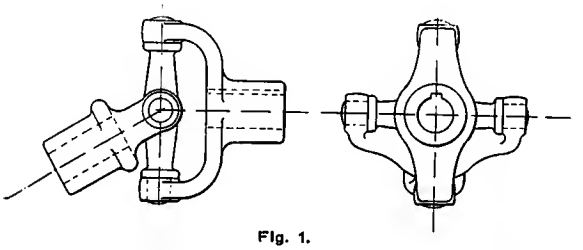
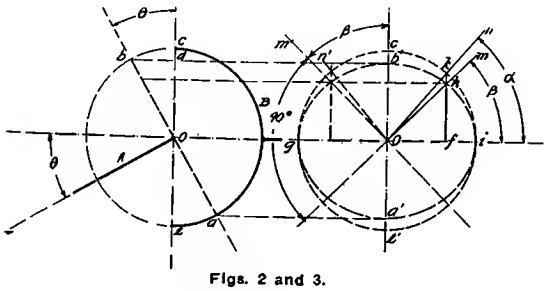


Fig. 1.

whose axes intersect in a point, with varying angles with each other; and although modified forms of the device are made which allow for lateral displacement of the axes, it is the purpose of the writer to analyze the operation, and determine the peculiarities and limitations of the universal joint in its true form; the modifications must necessarily be considered as individual cases, and are outside the scope of this article.

In its simple form, the universal joint consists of two shaft-ends terminating in forks and connected to each other by a cross member having two bearing axes at right angles to each other and which engage with corresponding journal bearings in the forks. This arrangement is shown in Fig. 1, and although joints



Figs. 2 and 3.

are made which differ in constructional details, the principles of this fundamental form apply in most cases. We will now proceed to the analysis of the movements of the several parts of the mechanism, when in operation, and for the sake of clearness, we will construct the diagrammatic view Fig 2, of the parts in the same position as in Fig. 1, and also the side projection Fig. 3.

Assuming that the joint has a position as shown in Fig. 1, where the fork B lies with its shaft axis and its cross axis both in the plane of the drawing and the fork A with its shaft axis in the plane of the drawing, and making an angle of θ with the axis of B, then the cross axis will have a position perpendicular to the plane of the drawing. It is evident that in rotation the extremities of the fork B will always move in the line c-e, Fig. 2, and in the circle c'-g-e'-i, Fig. 3, while the extremities of the fork A will describe the line b-a, Fig. 2, and the projection of this trace, in Fig. 3, will be the ellipse, i-b'-g-a'. Starting from the position, c'-e', as shown in Fig. 3, the fork B being at c' and e' and the fork A at i and g, we turn fork B through some angle β, then the trace of the point i, of the fork A will be along the ellipse and its location will be determined by the point of intersection of the ellipse and the line o-m, which is drawn at right angles to o-m', since the projection of the cross axes must always be at right angles to each other, because the axes are themselves perpendicular to each other and one of them lies in the plane of the projection, Fig. 3.

We have then determined the projection, in Fig. 3, of the cross axis of A in its new position, but since this line in its true position lies in the plane b-o-a, it is necessary, in order to determine its actual position, to swing the plane b-o-a into the plane of Fig. 3, and we then find that the point h travels to k, and that o-k is the true position of the cross axis of A in relation to its shaft axis, and that the member A has moved through an angle α, while the member B, has moved through an angle β.

It is now necessary to determine the dimensions of the angle α in terms of the angles β and Θ.

From the properties of the ellipse we know,

$$fk : fh :: oi : ob'$$

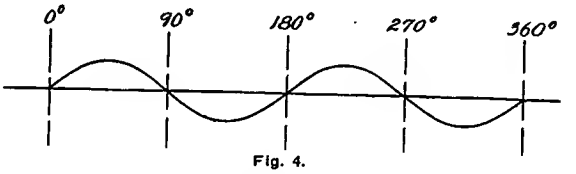


Fig. 4.

where oi is the semi-major axis and o-b' is the semi-minor axis. and from Fig. 3, we see that,

$$fk : fh :: \tan\alpha : \tan\beta$$

therefore,

$$\tan\alpha : \tan\beta :: oi : ob'$$

but,

$$oi = ob \text{ and } ob' = ob\cos\Theta$$

therefore,

$$\tan\alpha : \tan\beta :: ob : ob\cos\Theta$$

or,

$$\tan\alpha = \frac{\tan\beta}{\cos\Theta}$$

which is the algebraic expression for the angle moved through by B, in terms of the inclination of the shaft axes and the angle moved through by A. It will be noted that when $\alpha = \Theta$. $B = O$ and also that when $\alpha = 90$ degrees $\beta = 90$ degrees, or in other words, that four times in every revolution, the two forks stand

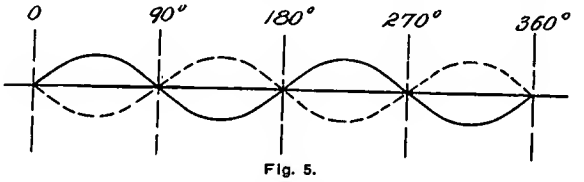


Fig. 5.

at 90 degrees with each other, and it is also evident that the maximum variation will occur midway between these positions.

Referring again to Fig. 3, and continuing the rotation of B for 90 degrees, we see that o-n of A will be at o-n' and is behind the member A an angular difference equal to the amount it was in advance in the former position, or in other words, its angular position is now negative while it was positive before. (The angular position must not here be confused with the angular velocity.) From what we have seen we may conclude that this

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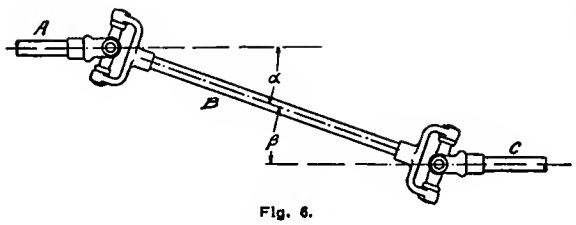


Fig. 6.

same angular relation is repeated in the two remaining quadrants of the cycle, and we may plot these relative positions; Fig. 4.

In practical application of the above, the maximum angular variation between the two members is probably of more interest than the angular velocity ratio, and in order to present this variation in concrete form, the following table will be of value.

Angle θ between shaft axes.	Maximum angular variation.	Length of arc, of circle of 3" diameter.
5°	6.57′	.00286 inches
10°	26.35′	.01149 "
15°	59.60′	.0260 "
20°	1°46.90′	.0466 "
25°	2°49′	.0737 "
30°	4° 7′	.1077 "
35°	5°41′	.148 "
40°	7°37′	.199 "
45°	9°35′	.251 "

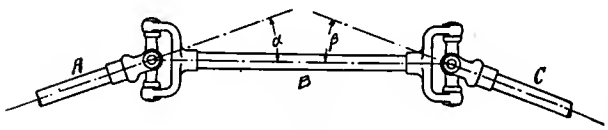


Fig. 7.

The angular variation and the length of the arc in the above are given as the numerical difference, which occurs both positively and negatively, twice in every revolution.

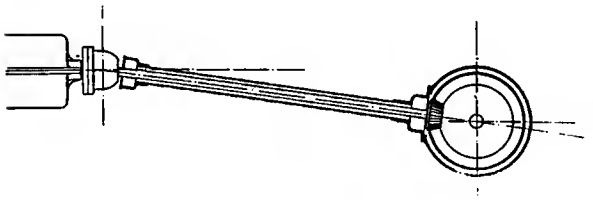


Fig. 8.

Recognizing this defect in the operation of a universal joint, it is customary, where smooth running between driver and driven parts is desired, to use them in pairs; the effect of this arrangement is to correct the variation of one joint by the complementary variation of the other. The graphical illustration of the effect of using joints in pairs, may be shown by referring to Fig. 4, and superimposing on this curve, that of another joint, in phase with the first but of opposite sign, as shown in Fig. 5.

The conditions, however, which must be met in order to give this result, are: That the fork axes of the stems of the intermediate shaft *B*, must lie in the same plane, and that the angle between both extreme shafts and the intermediate shaft shall be the same; this may be either as shown in Fig. 6, or as in Fig. 7, so long as the angle α equals the angle β. Evidently, the intermediate shaft, *B*, will have a varying angular velocity, but as this member is of small diameter and of light weight its non-uniform motion will cause no trouble in ordinary cases. It must be borne in mind, however, that we deal here only with that condition in which the axes of the driving and driven shafts, *A* and *C*, lie in some common plane; an analysis of the case where these shafts lie in different planes is more complex and is beyond the scope of this article. In the application of the universal joint to the main drive of automobiles, designers have commonly chosen one of the arrangements shown; Figs. 8, 9, and 10.

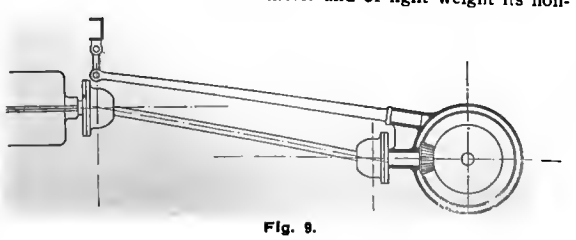


Fig. 9.

The construction as shown in Fig. 8, includes only one universal joint, and the torsion resisting member is concentric with the extension of the pinion shaft. In Fig. 9, one universal joint is used at the forward end of the propeller shaft, and the connection with the pinion shaft is by means of a semi-universal or more properly, a flexible coupling, which is universal only to a small extent and its function is to allow for discrepancies in alignment and end motion and it normally works in practically a straight line. Fig. 10 shows the use of two full universals; the torsion member being independent, as is the case in Fig. 9.

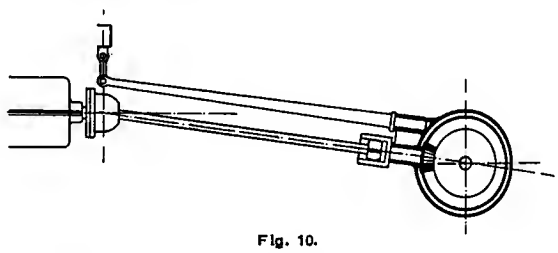
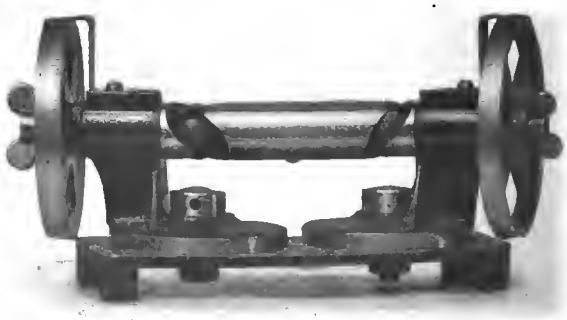


Fig. 10.

It will be noted that in the construction, Fig. 8, the driving pinion will have the varying angular velocity of a single universal joint, and the amount will depend on the angle at which the joint operates. The effect of the arrangement Fig. 9 is the same as that of the arrangement Fig. 8, but in Fig. 10, it is possible by means of the double joint to eliminate the variation.

By referring to the table given above, we may note directly the approximate variation from normal, at the pitch line of the driving pinion, for conditions such as shown in Figs. 8 and 9; the amount given being calculated on the basis of a 3-inch pinion.

The foregoing calculations are not intended to discredit any one type of construction, but rather to indicate the laws which determine the practical limitations of this particular type of mechanism. In conclusion, it may properly be said, that familiarity with the universal joint breeds respect, and although it seems to be called into service only as a last resort, the generous wearing surfaces, low rubbing speeds and smooth operation of a well designed universal must appeal as having mechanical virtues worthy of consideration. Given the same amount of time and thought in development which has been expended on the theory, design and manufacturing methods of bevel gears, it can easily be imagined that the universal joint would, in many cases, give a better performance than its accepted rivals.



Model Constructed by the Author to Prove His Theories.

PRACTICAL HINTS ON HANDLING A CAR

By ARTHUR H. DENISON.

IT would be hard to find two drivers who would handle a car alike. This is due to the experience the drivers have had, and their knowledge of the theory and principles of automobile driving and control. The owner of a new car will find that he cannot get as much out of it as the demonstrator for some little time, or till he is thoroughly accustomed to the car and knows how to handle it, whether traveling up hill or on the level.

Given suitable conditions, the gas engine will run indefinitely. A very slight fault will often cause an enormous amount of trouble, the symptoms of which may not be plain enough to enable the trouble to be located directly, and the whole system must be gone over sometimes before it is located. It is, therefore, necessary to know just what is happening under the bonnet, and just when some things should happen, that reasonable satisfaction may be derived from the car. There is no car that can be expected to be free from trouble, for even the best workmanship and material may give way sometimes.

Difficulties Met with in Starting Motor.

If a motor does not start on the first turn of the crank there is nothing radically wrong. On the first turn, or first piston passing over compression, the resistance due to compression may be felt, but the vapor compressed may not be a combustible mixture. It may be necessary to throw all four pistons over, and this will allow all four cylinders to be filled with a fresh charge of gas. The motor will then usually start on the next turn. While the modern carburetter is very sensitive, the height of the gasoline in the stand pipes, as controlled by the float, may be adjusted so low that the suction from the motor, when turned over by hand, is not sufficient to raise any gasoline, yet when running will work perfectly. There is, what may be termed, a critical adjustment to all types of carburetters and each has a corresponding throttle opening that has a great deal to do with the labor necessary to start the motor. This adjustment is not alike on any two carburetters and may range from a throttle opening of two or three notches to half or three-quarters on the control quadrant. If the throttle is open *too* much, and the motor being turned over by hand, the inlet valve is open for an appreciable length of time, and the piston is traveling at a very slow rate of speed in comparison to that when running. Under these conditions the rate of speed of the air currents flowing through the carburetter is so low that gasoline is not drawn from the spray nozzle, and though a certain amount of vapor is lifted by the column of air passing over the gasoline, the quantity is not sufficient to make a mixture that will ignite. On the other hand, if the throttle is not open enough the motor will choke itself, drawing too much gasoline. The suction is strong enough to draw the gasoline, probably in the form of fine drops, into the cylinder, where it is vaporized under the heat of compression and will either provide a mixture too rich to ignite or one that will burn so slowly that sufficient power is not developed to carry the motor over the following compression. Many motors will not run satisfactory till thoroughly warmed up and the warm-air inlet or hot-water jacket to the carburetter cannot furnish their necessary quota of heat until the motor has been running for some little time.

Handling of the Spark—Jump Spark Ignition.

The position of the spark lever when starting is important. If the car is provided with jump spark ignition, the system is usually arranged to permit starting on the spark. To allow this the full retard must be arranged so that the cylinder, whose piston is on its firing stroke, will allow ignition to take place with the piston half way down. Here the tension of the gas in the cylinder is very much less than that when on the dead center. If the motor has been standing and is cool, the tension of the gas falls to atmospheric pressure on account of the leakage and giving up of its heat. For this reason the term "starting on compression" is not correct. The motor will not retain a charge of gas at a pressure above that of the atmosphere for any length of time because of leakage through the piston rings, etc. To prove that it is not compression but merely the expansive action of the gas ignited at atmospheric pressure, which causes motor to start, the spark plugs may be taken out and replaced, and if the mixture remaining in the cylinder has the proper proportions of air and gasoline the motor will start when the spark is switched on. When the plug is out there would be an open passage from the compression space to the atmosphere, and according to the laws of air and gas, any pressure in the cylinder above that of the surrounding atmosphere would be immediately dissipated. This may be proved also by merely opening the petcock of the cylinder on compression. If the spark lever is fully retarded and the current switched on, igniting the gas, the resistance due to inertia must be overcome. The piston, already half way through its stroke, will only travel an inch or so further before the exhaust valve will open and the remaining energy developed by the charge will be directed out through the open port. Unless enough energy is stored in the flywheel to carry the motor over the following compression the motor will stop. This may happen whether an attempt is made to start on the spark or by turning it over with the starting crank. In either case one explosion may be heard and then the motor stops. This trouble is rather mysterious, but can be readily overcome by advancing the spark lever the distance of an inch to an inch and a half along the circumference of its quadrant, thus securing the initial impulse taking place just after the piston has commenced the power stroke. One quick jerk, throwing the piston over compression will do more good than five minutes' slow cranking. The manufacturer should set the starting crank so that the maximum compression should be felt when the crank is about 10 degrees past the horizontal. If the motor starts readily on the spark, and it will if the carbureter adjustment is such that the mixture is a trifle rich, the usual practice is to throw the control lever to full retard to secure the initial impulse and then advance it to normal running position.

Handling of the Spark—Make and Break.

A motor equipped with make-and-break ignition usually has the igniters set fully retarded, i. e., to fire a fraction of an inch past dead center. On a motor of this type a back-fire is very liable to occur if the spark lever is advanced only a few notches. In order to escape the serious consequences that may follow this (many arms and wrists have been broken) a good habit to cultivate is that of returning the spark advance and throttle levers to the proper position for cranking the motor before leaving the car, or immediately on stopping the motor. When on the road the best results are usually obtained by advancing the spark lever as far as possible without the motors pounding. With the make-and-brake system it is customary to advance the igniters to a fixed point and control the speed of the car with the throttle. Rules for handling the spark lever cannot be laid down, as conditions vary with the kinds of roads being traveled, difference in motors, etc., but a good driver will not allow the motors to pound.

One Frequent Cause of Inlet Valves Leaking.

A good feature on an American car is an adjustment that will allow the operator to throttle his motor to as low a speed as desired when the load is off. The connection is placed on the dash. The general practice among drivers, when wishing to keep the motors running slowly, is to retard both spark and throttle levers as much as possible, the adjustments being usually set to allow the motors to just keep running under these conditions. This practice is responsible for the need of grinding in valves at short intervals. With the spark lever retarded, the gas is ignited so late in the stroke that the exhaust valve opens before the

charge is burnt, consequently the gas at a very high temperature is passing between the valve and its seat, heating both to an unnecessary extent. The cool gas, coming in on the suction stroke, will help the water-cooling system to keep the valve cool, but even with this help it will not withstand the heat very long and is soon warped, allowing leakage during the compression stroke. The remedy is to adjust the throttle so that the motor may be run as slow as desired with the spark advanced so that ignition is taking place nearer dead center.

Proper Care and Operation of Clutch.

Successful operation of the clutch cannot be expected unless the clutch, the pedal connections and universal joints between the clutcb and gear box are cared for. Clutches employing leather as one of the friction surfaces, such as the cone and expanding types, need pretty regular attention. To insure the best results the leather should be kept soft and pliable as a razor strop. The multiple-disc clutch usually runs in oil and gives little trouble. As the oil has to be squeezed out before the clutch can take hold, this type of clutch is easier on the car and less liable to be injured by careless handling. It is by no means rare to see the rear wheels of a car jump off the ground when a "fierce" clutch takes hold. This racks the car a great deal, and is very destructive on tires. Castor oil or neatsfoot oil make an excellent dressing for clutch leathers.

Handling of Gears Sure Test of Driver's Ability.

Skillful handling of the gear-shifting lever on a sliding-gear system can only be obtained by practice. One of the best tests of a driver's skill is to notice the way be handles his gears. A skillful man, accustomed to a car, will pass through all speeds, either up or down, noiselessly, unless for the click caused by the lever bringing up against the quadrant. There are two systems in general use, and they are termed the Progressive and Selective. In the progressive, the different gears are meshed by a lever working in a single path, either forward or backward. In general practice it is arranged with three speeds forward and reverse, occasionally four speeds forward. It was brought out by the Panhard Company, who still use it.

The Selective system originated with the Mercedes Company and has many advantages over the Progressive. The name—Selective—indicates that the neutral position of tbe lever is so arranged that any gear combination may be engaged, and the lever may pass from any gear directly to neutral without passing through any other gear, something impossible with the Progressive system.

With the Progressive gear the system is usually arranged so that reverse is in mesh witb the lever at the extreme rear and high speed at the forward end of the quadrant, the intermediate speeds proportioned in between. The lever usually has a button on top, controlling a latch that locks it in place at any desired speed by fitting into a slot cut in the quadrant. The easiest method of securing the proper amount of travel, from one speed to another, is the following: Press the button or finger clasp that releases the latch from its slot, and while holding it released move the lever far enough to prevent its slipping back into the slot when the button is released. The latch will now be pressing against the quadrant bar, and the lever can be moved until the desired gear is properly meshed, where the influence of the spring will pull the latch into the slot and lock the lever. If the latch is held released the result may be that the lever be carried too far into the following neutral. If this occurs the best thing to do is to stop and come back to first speed again.

The Progressive gear, as worked out by the Packard Company, does not have a locking device on the lever, the same result being obtained by a device in the gear box. When shifting from first to second, or from third back to second, the lever should be carried rapidly forward or backward until the gears are felt to engage. The locking device, though not automatic, will check the travel of the lever, and if the gears are properly in mesh will provide sufficient resistance to the movement of the lever to assure the operator that the gears are correctly in mesh.

Drivers handling the Selective system have two things to remember. The first is to keep it well oiled that the lever may slide freely sideways. The second is to keep their hands off the button unless it is desired to enter reverse. The lever works in an H slot, the cross bar of which represents the neutral path. Reverse is reached by providing a third path outside, and to prevent the lever entering it accidentally a projection is cast on the plate. Tbe lever is provided with a latch, controlled by the usual buttou on top, and when the button is pressed the latch is thrown to clear this projection. The lever will then pass freely to engage with the reverse sbifting rod. To mesh the gear it is moved backward or forward in the usual way.

Some cars have appeared on the market with the speeds arranged like this R 2 4. If on a bill and conditions demand a
1 3
change to a lower gear, say, third back to second, if the driver handles the lever without touching the button, he will have no trouble. If he does, he is almost sure to enter reverse, with possibly serious consequences.

The clutch should be thrown as far forward as possible before any attempt is made to engage the gears. (Some cars have appeared with only one pedal so arranged that the clutch was first released and furtber travel of the pedal applied the running brakes.) The different types of clutches in use and the care bestowed on them has much to do with the ease with which the gears may be engaged. The cone clutch, with its comparatively large diameter, is likely to spin longer than the multiple disc. Any attempt to mesh the gears while the clutch is spinning will result in the gears growling, possibly chipping the teeth. Few types of clutch can be depended on to stop spinning as soon as the clutch pedal is pressed, and it is advisable to wait a moment or two before attempting to engage the gears. Occasionally the shaft will stop so that the teeth of one gear will strike the teeth of the other and prevent them meshing. When this occurs engage the clutch again for an instant, thus letting the clutch shaft spin, and after giving them time to stop spinning try to mesh the gears again. After the car has started and it is desired to shift from first to second, etc., speed the engine for a moment, close the throttle, then release the clutch and shift tbe gears. If the engine has not reached too high a speed this will allow the gears to engage quietly.

Never attempt to force the gears into mesh. If they will not engage without being forced, there is something wrong and jamming down hard on the lever is only liable to aggravate the trouble or spring the shifting arm or lever. The noise or growl so frequently heard is caused by the attempt to force the gears together while they are traveling at different rates of speed. This serves to grind and chip the edges, occasionally breaking the teeth. Judging from the condition of the gears from the majority of cars in the repair shop, the only conclusion is that the average driver seldom waits long enough before attempting to engage first speed. In some instances careless handling has resulted in allowing the clutch to take hold when only half the teeth were in mesh and the teeth were half ground away.

Handling a Car on the Road.

Very little can be said about handling the car on the road. The operator must handle each separate case as he meets it. New York has policemen whose sole duty is to regulate traffic. On a country road the farmer will either give the motorist the whole road or won't move until he has to. He isn't a bit particular whether he turns to the right or left. Similarly when following and trying to overtake another automobile on the road, the driver of the leading machine may try to prevent the other car from passing him, or may take that side of the road that looks best to him regardless of rules or laws. Wben passing little breaks in the road caused by water running off and carrying the road material with it, holes in pavement, etc., the shock of striking the edges is rather severe on tires and may be lessened by releasing the clutch for the moment and allowing the car to coast, always taking "waterbreaks" and similar rough spots straight on, so as not to strain the car unnecessarily.

LETTERS INTERESTING AND INSTRUCTIVE

HIGH AND LOW TENSION MAGNETOS.

Editor THE AUTOMOBILE:

[1,574.]—Will you kindly explain through "Letters Intereeting and Instructive" the difference between high and low tenelon magnetos? I mean the difference in working parts and the eystems with which they are used. I think a great many people would be interested in an explanation of this, because, for some reaeon or other, literature on this subject seems very scarce and uninforming. I have been told that low tension magnetos can only be used with make-and-break ignition. Is this correct?

Ludington, Mich. M. E. CARTIER.

There is considerable vagueness and inaccuracy, at least from a strictly electrical standpoint, in the description of automobile magnetos, and this is no doubt responsible for much of the popular confusion. The simplest form of magneto is the low-tension, which consists of a number of permanent horseshoe magnets and an armature rotating between their poles.. As the armature cuts the "lines of force" of the magnets an electrical current is set up in its coils, and this is collected by a suitable brush. In this form the magneto is generally used with make-and-break ignition, but it could be used with jump-spark also, in connection with a timer and spark-coils, or a timer, single coil and high-tension distributor. As a rule, however, when this type is used with jump-spark, the timer and distributor are mounted on the magneto, and it is then usually called a "high-tension" magneto. As mentioned above, this name is electrically incorrect, for the magneto generates only a low-tension current, which is then transformed by a separate spark-coil. About half of the so-called "high-tension" magnetos on the market are of this type.

A true high-tension magneto, on the other hand, has a second winding on its armature which takes the place of the spark-coil, so that its current when collected for distribution is already high-tension. There is little difference in the external appearance of the two types, and the only sure way for the layman to distinguish between them is to look for the separate spark-coil.

QUESTIONS ON IGNITION SYSTEMS.

Editor THE AUTOMOBILE:

[1,575.]—In your "Lettere Interesting and Instructive" will you please give me the following information:

1. What is the best voltage for ignition with the make and break system (low voltage interchangeable with dry cells)?
2. Can a make and break system be ueed without an induction coil?
3. Is it practicable to use an Apple dynamo on a make and break system without the coil, and if not, why?
4. What is the advantage of using water with the gasoline mixture?
5. Can water be utilized to the same advantage with alcohol?
6. In testing dry cells to get at the comparative life of different makes of batteries, how long should they operate constantly on a coil requiring one ampere (not on a machine)?

Manila, P. I. F. H. THOMPSON.

1. The low-tension magnetos used for this purpose usually generate about 100 volts at their maximum speed; with dry cells an induction coil must be used.

2. With a magneto, yes; but with dry cells the coil is necessary. The coil used need not be as powerful as the regular jump spark coil. Most manufacturers of electrical goods have a special type for make-and-break ignition.

3. No, because the Apple dynamo has only about the same voltage as a set of dry cells.

4. There is no advantage we know of; in fact, a little water in the gasoline will usually stop the motor entirely.

5. A small amount of water in alcohol makes no difference.

6. The cells should last as many hours on a one-ampere coil as the number of ampere-hours of their rating, which depends on their size. It is not fair to the batteries, however, to run them constantly, as they give much better results when used only intermittently, as for ignition on a gasoline engine.

LARGE WHEELS AND LONG WHEELBASE.

Editor THE AUTOMOBILE:

[1,576.]—I have a suggestion to make with reference to tires for the "ideal car." I have owned two machines already and know how tired one gets of punctured tires. We must use pneumatic tires on wheels between 30 and 40 inches in diameter on American roads. But would not eolid tires on 50-inch wheels give as smooth running as pneumatic tires on 36-inch wheele? I belleve they would. A larger wheelbase would alao help the riding qualitiee. Wheels and frames would both have to be stronger and frames would have to be dropped in order to retain the same center of gravity for the entire car. But I believe that the advantages of 50-inch eolid tiree and 160 inches wheelbase for seven-passenger cars and 44-inch solid tiree and 136 inches wheelbase for runabouts (high-power cars only being considered) would far exceed the disadvantages.

La Fayette, Ind. A. L. SHERIDAN.

There can be no doubt that the sizes of tires and wheelbase which you suggest would give sufficiently easy riding, but the key to the situation is in the last sentence. Would the advantages exceed the disadvantages? Most manufacturers seem to think that they would not. The weight of the car would be enormously increased, and the steering would be very awkward, requiring a 10-acre lot to turn around in. The larger the wheels, the smaller is the maximum angle through which they can be turned for steering, without striking the frame; and the longer the wheelbase, the greater is the steering angle required for turning in a given radius. Thus you are increasing your difficulties in two ways at once.

AN IDEAL CAR OF IMPOSING DIMENSIONS.

Editor THE AUTOMOBILE:

[1,577.]—Under your very expreselvely and accurately named heading, "Lettere Interesting and Instructive," will you kindly furnieh the following information?

1. For a man who does not want to go shopping, marketing or on exhibition through city streets, but who wants to get out in the country close to Nature and divide this luxurious experience with hie family and a few friende, and yet who has to go over roads (not pikes), is not a 60-horsepower, 7-passenger, 168-inch wheelbase, 60-inch tread the ideai car?
2. With the above wheelbase and tread would not a car having 44-inch wheele be as free from skidding as present sizes?
3. Are not the majority of bodiee for seven passengers too short for comfortable riding for more than an hour or two?
4. If spark is advanced until the mixture ie fired before the crankshaft has passed dead center does it have any appreciable effect on heating the cylinders? LEARNER.

Birmingham, Ala.

1. Your "ideal" is entirely too large for any practical use; on the roads you speak of you would find it about as manageable as a small locomotive. Half the power and two-thirds the wheelbase would serve you much better.

2. The only way to find out would be to build such a car and make experiments.

3. Not necessarily; they are usually very well designed.

4. No, advancing the spark prevents heating, owing to the rapid firing and exhaust of the charge, while retarding the spark causes the motor to heat, but there is a limit to the advance.

OVERCOMING THE CARBURETER "POPPING."

Editor THE AUTOMOBILE:

[1,578.]—I own a Mitchell (1908) touring car on which is a Holley carbureter. This carbureter has worked perfectly until a month or so ago, when on cranking the engine it would "pop" several timee before settling down to work. It has been getting worse and worse until now it is all I can do to start the engine. It will "pop" maybe for fifteen minutes before I can go; after that it goee as well as it ever did. After the motor has stopped sometimes only fifteen or twenty minutes, it is very hard to start it again, no matter how hot the cylinders are or how warm the day. I have taken the carbureter all apart, but can find no dirt or anything in it, or no parts worn or broken. I know it is adjusted right, although now I cannot start on the epark immediatsly after stopping the engine. The valves are in good condition, too. I know the gasoline to be all right, and the pipes leading to the carbureter to be clear.

If you could suggest anything to overcome the trouble, I would be very greatly obliged. W. N. HUTCHINGS.

Mooelc, Pa.

You do not state whether the Holley carbureter you have on your machine is of the new Venturi tube type, more familiarly known as the "puddle" type, or of the spray nozzle variety, although, as a matter of fact, "popping" usually proceeds from a similar cause regardless of the type of carbureter. It is set up by the fact that the mixture is either too rich or too weak and on that account continues to burn, not only throughout the length of the stroke, but after the exhaust valve has closed. This maintains considerable excess pressure in the cylinder, which naturally escapes through the inlet valve the moment the latter opens; it is the release of this pressure through the inlet valve that constitutes what is familiarly known as "carbureter popping," and it can usually be remedied by making the proper air and fuel adjustments at the carbureter.

The fact that in your case it occurred at first only at starting was an indication that the carbureter adjustment was more nearly correct for the engine requirements at the higher speeds, and as soon as the motor speeded up a bit, it ceased. We very much fear that your "I know it is adjusted right" may not be entirely based upon fact, and if you will overcome this fault you will probably find that there is nothing else the matter. If you will carefully read H. L. Towle's "Getting Acquainted with a Carbureter," which appeared in THE AUTOMOBILE of September 24, we think you will find a great many more pointers than could well be put in a reply to your letter in these columns.

ADVANTAGES OF A FIXED POINT OF IGNITION.

Editor THE AUTOMOBILE:

[1,579.]—Will you kindly describe in "Letters Interesting and Instructive" the advantagee and disadvantages of a fixed poInt of firing for machines depending upon a magneto for ignition.

Alameda, Cal. HENRY M. POND, M.D.

To begin at the tail end, we do not know of any particular disadvantages arising from the use of a fixed point of firing the charge where both the magneto and the rest of the system have been properly designed. Of 30 representative French motors, probably 40 per cent. were found to be equipped in this manner. On the other hand, its advantages are that the motor is always run with a uniform firing point, which should not only tend to increase its average efficiency, but also to lengthen its life. As the magneto is not subject to the various factors of "lag" that are present in the coil and battery system, there is not the same necessity for providing a wide range of advance. It is customary to provide means for retarding the magneto for starting, but as the latter does not generate as efficiently at the lower speed of cranking, as it does with the motor running, this is but slight. The magneto's voltage increases with its speed and, in consequence, it automatically takes care of the slight amount of extra advance required over that at which it is set. Practice is tending slowly in this direction and doubtless the fixed point of ignition will, sooner or later, become general.

SEASON FOR NON-FREEZING SOLUTIONS OPENS.

Editor THE AUTOMOBILE:

[1,580.]—Will you kindly advise me how low a degree of temperature a solution of one-half alcohol and one-half water, put in my radiator, will stand before freezing. Will you also advise ms if wood alcohol will serve as well as grain alcohol in this case. Is there anything better that I could use for this purpose?

Ansonia, Conn. LUCIUS B. TERRELL.

A 25 per cent. solution of alcohol and water will resist freezing down to zero Fehrenheit, so that a 50 per cent. solution such as you mention would doubtless be capable of resisting any temperatures prevailing here in the East. Wood alcohol will serve as well as grain alcohol, but neither carries with it a very strong recommendation for the purpose, owing to the instability of the solution, i. e., its constant loss by evaporation, and as the alcohol boils at a much lower temperature than the water, the former will pass off much more rapidly, constantly decreasing the ability of the solution as a whole to withstand freezing. The wood alcohol also attacks the rubber hose connections. A better non-freezing solution may be obtained by using calcium chloride; a 25 per cent. solution will withstand a zero temperature, and below that will only become mushy and not freeze solid enough to do any damage, unless the cold were of a severity seldom known in this part of the country. Increasing the proportions will naturally increase its non-freezing properties.

ON THE SPARE-WHEEL BALL-BEARING QUESTION.

Editor THE AUTOMOBILE:

[1,581.]—In relation to the criticism by Henry Hess, publisbed in "The Automobile" of September 17, page 401, involving the use of a spare wheel (in an emergency) ae advocated and sold by the Spare Motor Wheel Company of America, Ltd. (Stspney Spare Wheel), I desire to say, the placing of the extra wheel outside of the regular wheel and fastened thereto, but utilizing the regular wheel hub (and, ae a consequence, the ball-bearings in the regular hub), must, as Mr. Hess states, transfer the plans of the load. Thus is one bearing relieved of some of ite burden, and if it is weak, it must accordingly congratulate itself, as it were. But if Peter is thus deprived of hie burden, Paul muet tote it for a while. If Peter ie so weak as to rejoice at the loss of the burden, Paul must also be a little off of the top as well, since Peter and Paul ars botb in the eame boat. (Two bearings in one wheel hub.)

There was a time in the history of ball bearings when their life was short, even with no great load. Time wrought changes, and in time a factor of safety crept into the zone, now dominated by ball bearings. This factor of safety is cialmed to be very large when purchases of ball bearinge are made, and experience has proven that the goods are generally delivered on a basis far more reliable than can be claimed for the dslivery of coal.

Builders of care have great respect for the advice of ths maker of ball bearings, which respect is shown in a most satiefactory way, in that the bearings are (I might say) invariably larger than the makere of ball bearings are wont to recommend.

Under the circumstances, then, it does seem ae if the Stepney spare wheel, or any other devlce of the kind, will scarcely disturb the obvious serenity of the ball bearings in the wheel hub.

No man would be justified in riding in an automobile if hs was skating on the thin Ice portrayed in the condition that is represented by the possible failure of the ball bearings in the wheel bubs, merely because the plane of the load has been traneferred a distance equal to the section diameter of a tire.

As Mr. Hess says, limit the time of the use of the epare wbeel to the time during which it serves its obvious purpose, but who would want to keep ths epare wheel on any longer? On ths other hand, the spare wheel will not level the road inequalities, and these inequalities certainly strese ball bearings more than any spare wheel possibly can.

It le perfectly reasonable to aesume that an autoist wbo has to apply the spars wheel will be a little more careful over considerable road inequalitiee than he would ordinarily be, and this difference will surely amount to more than that resultant of ths small transfer of the plan of the plane of the load, due to the use of s spare wheel.

Automobiliets who are not sharps, when it comes to mschanical hair splitting, might think that ball bearings are weaklings, so easily disruptsd that the mere application of a spare wbsel would do the trick. Were they to reach euch a point in a scheme of reasoning, more inertia would impel them further, and they would (according to the law of probabilities) reach the final conclusion that a mile a minute in a car fitted with wheele that would surely come off if the ball bearinge were to go to piecss is too near heaven. THOMAS J. FAY.

Brooklyn, N. Y.

ABOUT DELAGE'S "MONO" IN THE GRAND PRIX.

Editor THE AUTOMOBILE:

[1,582.]—I notice in Mr. Ricker's letter in your last issue—September 24—a slight error regarding the Delage Voiturettş, winner of the Dieppe race of last July, which I should like to correct. All of the Delage cars were single cylinder 100 m.m. bore by 160 m.m. stroke. Guyot's motor was designed by Delage and built at the Ds Dion works, and the other motors were De Dions specially built for the race. Guyot's motor was one of the most beautifully balanced ones that I have ever seen. Of couree I am referring to "one lungers" only, or "mono'e," as we call them over there. When the motor was cranked, the chassis would vibrate vertically; there was no side rocking as in the other cars. Aside from ths motors, the care were mads up entirely of stock parts. Delage is a friend of mine, and I was with him at Londinieres.

New York City. SANFORD POMEROY.

HOW TO ATTACK THE ROADS' DUST PROBLEM

WASHINGTON, D. C., Oct. 5.—Excerpts from a report on dust preventives prepared for the Department of Agriculture by Prevost Hubbard, assistant chemist in the Office of Public Roads, and just issued for general distribution, are of more than passing interest to automobilists. The report says:

"The suppression of dust on roads is a problem which has become prominent only within recent years, but its importance is rapidly increasing, as it involves the saving of much money and the comfort and convenience of the public at large, as well as of road users. In arriving at a complete understanding of a subject of this kind it is essential that as broad a view of it as possible be obtained, and, in order to achieve this result, one must look at the matter from at least three different standpoints—that of the engineer, the chemist, and the layman. The direct solution of the problem depends to a great extent, of course, upon the efforts of the road engineer, but the aid of the chemist and road user will eventually prove to be important factors which cannot be overlooked. The subject is one which also deserves the attention of the general public, as it has a very direct bearing upon matters which are of universal interest.

A Moon Among the Colorado Mountains.
Fred C. Merry and family of Kansas City, Mo., who toured from Kansas City to Denver in their Moon automobile. The picture is interesting as showing the kind of country tourists can traverse nowadays.

"In considering the cause, or rather the causes, of dust formation a few general remarks may not be out of place. The term 'wear,' when applied to solid substances, undoubtedly expresses the fundamental cause of such formation, although other factors which make wear possible and which tend to remove and distribute the dust formed play important parts. All forces which tend to disintegrate or destroy will of necessity produce wear, and these forces, when considered in connection with roads, may be conveniently classed under three heads—chemical, physical and mechanical.

"The automobile is, perhaps, the most potent factor which at the present time operates to produce dust and destroy roads. When moving at a high rate of speed its broad rubber tires exert a pulling or lifting effect upon all loose material on the road surface and a cloud of dust is sucked up and carried along behind each vehicle. The slightest current of air then carries the dust cloud over the surrounding country. The enormous increase in the last few years of fast motor traffic along public highways has aroused general interest in the subject of dust prevention.

"The coincidence of the appearance of the automobile with the aroused interest in the dust nuisance has led to the impression that the former is the sole cause of the trouble. It will be remembered, however, that the dust nuisance on a somewhat smaller scale existed long before the coming of the motor car. If the automobile has resulted in an awakened interest in this problem, it will have served a valuable purpose, but besides this it has undoubtedly exerted a beneficial influence in arousing the public at large to the knowledge that good roads are necessary to the country's welfare.

"The dust problem as it stands to-day seems to be open to two methods of attack: (1) by applying materials to the road which will hold down the dust formed, or (2) by methods of construction designed to reduce the formation of dust, and therefore the wear of the road, to a minimum. Dust prevention has so far been mainly confined to the treatment of old macadam.

24 COUNTRIES SEND DELEGATES TO ROAD CONGRESS

PARIS, Oct. 4.—Twenty-four countries, including the United States, Brazil, Mexico, Chile, India and Japan, will be officially represented at the first International Road Congress, which opens its official sessions at the Tuilleries October 12. The scope of the work of the congress is very bread and great good is expected from the exchange of opinions which will take place. A glance at the numerous papers which will be read before the congress and which will have already been translated so that their contents may be available for all, emphasizes how far America is behind in the matter of roads, compared with Europe.

This is not, of course, to be wondered at considering that every country in Europe, even the most backward, has for centuries possessed the foundations of magnificent roads built for military purposes. Nevertheless, it is starting to read, for instance, that of the 2,151,570 miles of public road in the United States only 7.14 per cent., or 153,662 miles, are improved. The mileage of improved roads in the United States, therefore, is only equal to the mileage of the magnificent French National and departmental roads, which average between 24 and 25 feet in width.

A large proportion of the work of the congress is to be devoted to the consideration of the effect upon roads of new means of transport, especially automobiles, and an attempt will be made to approximate the best method of constructing the ideal road of the future. The papers of the experts agree that the essential feature of a good road is a hard core, preferably of armored concrete making an unyielding incompressible foundation with the material perfectly bound together, and the surface properly metaled and tarred to prevent dust or mud. Methods and materials suggested vary greatly, but all agree that tar up to the present time has proved most efficacious against water and the prevention of dust.

The general American delegates are L. W. Page, director of the Public Roads Bureau of the Agricultural Department; Clifford Richardson, of New York, and Col. Charles S. Bromwell, superintendent of Public Buildings and Grounds of the District of Columbia. In addition, Massachusetts sends Harold Parker,

chairman of the Highway Commission, and A. B. Fletcher; Mississippi has named Charles Scott. Bishop Galloway and Representative John Sharp Williams; Washington, Samuel Hill, and New Mexico, Numa Reymond.

NOTABLE EXPERIMENTS IN ROADMAKING.

The problem of building durable and at the same time dustless roads has become such a momentous one that men all over the country are bending their efforts towards a speedy and successful solution. The State roads, as at present constructed, have not only proved to be unsuited to the constantly increasing travel, but they are an enormous expense. With this question of expense in view, the men who are spending the most time on the problem, are working not only to find a combination of materials which will withstand any reasonable demands being made of it, but they are after a combination which will cost less.

For the last few years the scientists in the office of the public roads of the United States Department of Agriculture have been working along these lines. So far they have spent most of their time in the attempt to make use of the enormous quantity of slag which is to be found near all blast furnaces. The slag is being used to take the place of the broken stone, and combinations have been made up with both tar and asphalt. One stretch of experimental road is being constructed out of the slag asphalt combination near Chicago, under the supervision of Chief Engineer Pierce, of the Federal Bureau. Another stretch made out of the slag-tar combination is under way at Birmingham, Ala., under the direction of Assistant Engineer Heidel. These stretches will be watched with interest during the next year to see how this new class of road is going to stand the wear.

A more novel experiment is being tried near Newton, Mass., with an entirely different substance—molasses—which is almost a useless by-product of the great sugar refineries in the South and West. A half-mile stretch is being prepared where the molasses is going to be tried as a binder.

MAINE'S ADVANCE IN ROAD BUILDING.

PORTLAND, ME., Oct. 5.—On every hand there is evidence that a great advance has been made this year in plans for the construction of State roads. The many meetings held througbout Maine by State Highway Commissioner Paul D. Sargent bave borne fruit, with the result that many towns have already commenced the construction of better roads, taking advantage of the opportunity to secure money from the State, or are about to begin work.

One of the longest pieces of State road being constructed in Maine this season is in the town of Rumford Falls, where about 21-4 miles of road is nearly finished. The road in question is being constructed of macadam, with a width of 15 feet, and a special feature in connection with the work is the construction of about 3,000 feet of side sub-drain, as the road lies mostly on the side of a hill from which a large amount of subsoil water has in the past found its way into the road. The work also includes the construction of 22 culverts.

Announcement is made by Commissioner Sargent that there are 16 cities and towns in the State in which State road work has been advertised and work begun or nearly begun. These places are: Brunswick, South Berwick, Houlton, Ellsworth, Caribou, Eden, Gardiner, Madison, Fort Fairfield, Westbrook, Presque Isle, York, Rumford, Kennebunk, Sanford and Portland.

In discussing the work with a representative of THE AUTOMOBILE, Commissioner Sargent said:

"It is the aim of this department to have one good highway across the State. With that end in view, the sections of the road constructed each year are so laid out that they will join previous sections. In this way, as each town constructs a section of road, the aim of having a good highway for automobiles and all vehicles right across the State from Kittery to Calais is being gradually realized and it will be but a few years before this is completed."

SOME DANGER POINTS IN AUTOMOBILE USE

BY A. D. HARD, M. D.

SOMETIMES a very small matter leads to results of great importance. A steering gear that is not sensitive to the touch, or one that from lack of lubrication has become sticky and does not so easily respond to the force usually applied by the accustomed driver, will so hamper the control of the car that, when skidding occurs in sand or wet, the car may go over an embankment or into a ditch. The writer has investigated this matter and found that three fatal accidents which he had the opportunity to carefully examine, were due alone to this cause. When a steering gear is composed of a worm gear sliding a large nut up and down to convey motion to the steering arm, there is great danger of the nut becoming dry and working with much greater resistance to the hand on the wheel than it sbould. It is an objectionable form of steering mechanism for this reason.

Another source of danger in the steering mechanism is the slack which is so common in some cars, even when recently out of the factory. Some engineers claim that this is a good feature instead of a bad one, but I think that any experienced driver will agree with me in saying that there should be but very little slack in the motion of the steering wheel. An instantaneous response to the guiding touch is the feature we want, to guard against undue deviations when the car is going at high speed. The actual time required to deviate enough to run off a grade, or into a ditch, or into an obstruction near the roadway, is so very small that none should be wasted in turning the steering wheel to take up slack. In my opinion as an experienced driver, the steering gear mechanism of the modern car has not had as much careful attention as it deserves.

As we all know, skidding is a source of much danger to both car and occupants, as well as to other vehicles that the car may be passing. The cause of skidding is found in the action of the differential. When one wheel slips the other drive wheel loses its guiding and propelling force, and the car is deviated from side to side by the uneven traction of the wheels. Racing car drivers have found that with no differential they are much surer of their footing in bursts of speed. If we could have a differential mechanism, which only acted when the front wheel were deviated a certain distance from straightaway, and the driving axle acted as a unit under other conditions, we should have all the advantages of a differential when it was needed, and the advantages of its absence when it was not needed. Another suggestion is to have a means of locking the differential at will. Another suggestion is to employ adjustable friction disc clutches between each drive wheel and the driving axle, with an automatic release for the inside wheel when turning corners.

Guarding Against Crossing Accidents.

The large number of fatal accidents due to crossing railway tracks at the wrong time has suggested all kinds of remedies. The warning noises of an approaching train are so similar to the usual noise of the automobile that they cannot be depended upon for the safety which the horse-drawn vehicle may have, and the speed of approach is so much greater that the car driver is furtber handicapped. There is one way which seems both safe and simple. The car should be driven up to within a few feet of the track and stopped, then prospects of danger can be hardly overlooked, and the car can proceed across the track or wait for the train to pass before doing so. In some parts of the country the signs at railroad crossings read: "STOP—LOOK—LISTEN." No better warning can be devised for automobilists in crossing railroad tracks. The Irishman was right when he said: "Niver cross before a train, before the train has passed."

NEW W. & S. MAGNETO OF THE INDUCTOR TYPE

IN addition to their line of carbureters, Wheeler & Schebler, Indianapolis, will market for next year an inductor type of low-tension alternating-current magneto which takes the place of a storage cell in the ignition system of a car. The magneto is friction driven from the flywheel or belt driven from any

Fig. 1.—W. & S. Inductor Magneto.

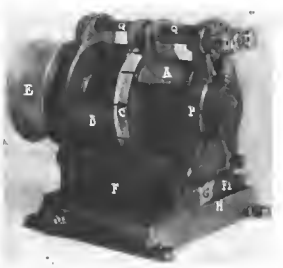


Fig. 2.—Minus the Field Magnets.

other part of the car and is made to rotate three or four times as fast as the motor crankshaft, giving a current of 5 amperes at 12 volts. For car work this inductor magneto can be used in connection with a set of dry cells, the same four-unit coil and timer being used for each and one set of plugs sufficing. Producing as it does an alternating current, it cannot be used for charging storage cells, but simply takes their place on a car.

Fig. 1 is the magneto complete with three permanent horseshoe magnets, although a double set of three is employed in all of the latest ones manufactured. At the end appears the aluminum belt pulley. In Fig. 2 the magnets and a brass case between them are removed, exposing every part of the apparatus, consisting of a rotating shaft carrying a three-pointed inductor *A* and another *B* with a coarsely wound coil *C* of flat copper ribbon between them. The ends of the copper ribbon connect directly with the binding posts *D* and *D1*, which completes the magneto. The winding *C* is stationary and nothing revolves but the two inductors *A* and *B*, which are pinned to the shaft which carries the friction wheel *E*, and which shaft revolves on a pair of F. &

Fig. 3.—The Strip Copper Winding and the Inductors.

S. ball bearings, one appearing in Fig. 5 at *M1*, carried in the end piece *P* of the magneto. In Fig. 4 appears an end view of the magneto, showing in detail one of the star-shaped inductors with its three arms 1, 2 and 3, regularly spaced at 120 degrees, and each arm consisting of twenty-seven laminations of high-frequency transformer iron pressed together and secured by soft iron rivets. The arms of the other inductor *A* (Fig. 3) are alternated with those of inductor *B*, and in this illustration is shown the copper ribbon winding *C* with the ribbon terminals at *D* and *D1*. The copper winding is given a white effect because of the layers of paper for insulation between the copper. The coil has seventy-two turns. In Fig. 4 *F* and *F1* are the pole pieces against which the ends of the magnets bear, and *G* is a separator of aluminum between them.

The generation of current in an inductor magneto of this type is briefly as follows: In Fig. 6 appears a diagram of an end view with *A1*, *A2* and *A3* representing the arms of one inductor and *B1*, *B2* and *B3* of the other, the coil *C* as before being the copper ribbon. When arm *A1* is in contact with the pole piece *F1* and arm *B1* of the other inductor contacts with the opposite pole piece *F*, then the lines of force between the north and south poles *N* and *S* of the magnets pass as indicated by the line *L* through the pole piece *F1*, through the arm *A1*, through the arm *B1* and through the pole piece *F* to the south pole *S*, thus setting up current in the coil *C*. As the inductors rotate arm *A1* breaks away from pole piece *F1* and arm *B1* from pole piece *F*, and while *A1* passes over the aluminum separator *G* between the pole pieces there is no current flowing. Immediately, however, that arm *A1* comes in contact with pole piece *F* the arm *B2* has reached the pole piece *F1*, and the lines of force pass once again between the poles *N* and *S*, but from the arm *B2* to arm *A1*, thus setting up in the coil *C* a current in the opposite direction to the first impulse. In this manner as the respective arms of the star inductors contact with the pole pieces there is set up current first in one direction and then in the other. As there are three arms

Fig. 4.—End View of Inductor and Poles.

Fig. 5.—One of the F. & S. Bearings.

to each inductor and the arms alternate, the magneto gives six pulls per revolution or, in other words, six alternations or current impulses for each complete turn of the shaft.

In wiring a car with an inductor magneto of this type and a set of dry cells, the magneto and dry cell wires go direct to the switch on the coil box, thence to the primaries of the coil and thence to the timer. The magneto cannot be used with a non-vibrating coil and distributor in that no provision is made for changing the timing by altering the relation of the inductors with reference to the magneto poles while rotating, but it affords an extremely compact and reliable source of current on a car, the inductor magneto lending itself to this purpose particularly, owing to its great simplicity, whether considered from an electrical or a mechanical point of view, which adapts it to the roughest kind of service.

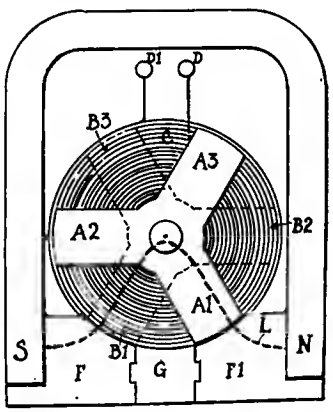


Fig. 6.—Magnetic Circuit of W. & S. Magneto.

Seeing Europe From the Rear Seat

By Frederick K. Stearns

Near Freiburg, Germany

Wayside Shrines – Tyrol

A Road in the Tyrol

IF you would see Europe properly, view it from an automobile. Also take your own car over, likewise your chauffeur. To the seasoned autoist on the Continent this suggestion may appear superfluous, but it is my advice to the novice in European travel, based on experience gained during three extended trips. True, there are drawbacks to such a plan, but they are more than offset by the advantages, particularly if one owns a good American car. The value of having your own chauffeur is most important. Of course, he is in a measure handicapped if unable to speak the language of the countries through which he drives, but even this is far better than employing an unknown native linguist as driver, however highly he may be recommended. I have had experiences in both directions, and know whereof I speak.

The car we hired in Italy, pending the arrival of my own Packard, had as chauffeur a clever fellow, but possessed of an irresistible desire to run over everything in the animal line he could reach and travel at breakneck speed through villages. Talking had no effect on him, and even more drastic measures proved unavailing.

The chauffeur who drove us around the Italian lakes was better, but he stood in with the garage that rented us the machine, and as a result we were charged fifty per cent. more than we contracted to pay.

The French driver we engaged early in the season to do the château trip had a seemingly unquenchable thirst, taking a drink whenever opportunity presented itself, and celebrating our arrival at Blois by taking our courier with him and getting gloriously drunk.

Nor were our troubles with the chauffeurs alone, but also with the people from whom we rented the cars. With a single exception, out of the half-dozen I contracted with each attempted to deal unfairly.

The first arrangement we made was a certain sum for the car, everything to be furnished. The trouble with this was that if we wanted to go a few miles out of our way to visit a certain point the chauffeur claimed it was not in the agreement and declined to go unless tipped liberally.

The next bargain made was at so much a day for the car and so much a mile for the distance traveled. This acted exactly the opposite to the first, for the driver would keep going all day, and far into the night if we had permitted him, and took us to places we did not care for, simply to make the distance greater and his bill higher.

Another arrangement we made was to pay so much a day for the car, we to pay for the gasoline, oil, keep of chauffeur, etc. This was the most satisfactory of all, but it was difficult to keep track of the supplies used, and we had to take it for granted that the bill rendered was right.

Take Your Own American Car.

Therefore, for the one who wants the full enjoyment of a European trip extending over several months, I should advise taking your own car, if you have a good one, and your own chauffeur. For, after all, the pleasure of motoring depends more than anything else upon the man who drives, and a good, intelligent American chauffeur who does not drink is a treasure without price. You cannot value him too highly when abroad.

With this detail disposed of, Europe, with its wonderful roads and its countless points of interest, furnishes a rich field for the tourist. True, much of it has been done to death, but there are still spots off the beaten path.

One of these is the Austrian Tyrol, a district where motorists have not been seen until within recent years, owing to the fact that it is not as well known for touring as Switzerland, and the difficulty of getting in on account of the high duty exacted.

Join the Touring Club of France.

If you are traveling through Europe in an automobile you should belong to the Touring Club of France. This gives the advantage of depositing the duty money on your car for each country you may desire to visit in Paris, a *triptych* being issued therefor and the money refunded on your return. This enables one to avoid all trouble at the customs in passing from one country to another. Austria, however, was the one country which refused to co-operate with the French club, and not until the middle of this year did she come into the fold. My *triptych* for Austria was about the fourth one issued

and our car was the very first to take advantage of the new working arrangement.

In driving from Munich to Innsbruck, when we presented our papers to the Austrian official at the frontier, he at first refused to accept them, insisting that we must make the customary deposit, amounting to nearly $500, before we could enter Austria. The French gentleman who traveled with us explained in his very best German that an arrangement had been entered into between the government and the Touring Club of France, and that if the official would look over his papers he might find a notification. This he finally consented to do, and much to his own surprise found our statement to be true. With an Austrian number attached to the car, we had it kodaked as the first of any make to go into the Tyrol under the new arrangement, and proceeded on our way.

The ride from Kupstein to Innsbruck is very beautiful, but it is nothing compared with that which awaits you in the heart of the Tyrol Mountains. We left Innsbruck the morning following our arrival, and made Brenner pass, which is easy of ascent, being only about 6,000 feet high. We made it on high speed, owing to good roads and the absence at that hour in the morning of other vehicles, but noticed that some of the best French cars, as well as others, went up on slow speed.

Lunching at Bozen, we obtained our first and only view of the magnificent Dolomites. Had we had more time at our disposal we would have gone further south, even into Italy, so as to visit these mountains and the beautiful district in which they lie. However, we went on to Meran, where we stopped for the night. The trip from Innsbruck to Meran is one of the finest in all Europe, and was excelled in beauty only by our next day's run to Bregenz. We ran within a few miles of the Stelvio pass, which is the highest roadway in Europe, but as we were not going that way did not take it. Another pass we encountered between Landeck and Feldkirch, while not so high as the Stelvio, was considered very dangerous by travelers, because of the excessively sharp hairpin and corkscrew curves on approaching and descending the mountains. The working of our brakes left nothing to be desired, however, and we got through safely, bringing our short but highly interesting trip through the Tyrol to an end.

Tyrol Trip Has No Equal.

To anyone who appreciates fine scenery and enjoys traveling through mountains the Tyrol trip has no equal. If more magnificent scenery exists anywhere, I have never encountered it. The towering, snow-capped mountains, the rock-ballasted roads, as a rule kept in excellent condition, the queer roadside shrines encountered at frequent intervals, the constantly changing panorama, leaves nothing to be desired unless it might be that more time could be spent here, and sends the traveler away with pleasant memories. In addition to the attractiveness of nature, the picturesqueness of the villages and the quaintness of the people in the Tyrol rounds out a picture of exceptional interest and one which the average traveler misses.

From Bregenz we drove to Freiburg, Germany, along the shores of Lake Constance and through the Black Forest. The roads are perfect and the scenery fine, alternating between views of the lake and those of the tree covered mountains. After a couple of days spent in motoring over the wonderful hills and through the vast forests around Freiburg we crossed into France by way of the Alberger pass, the border line being located on the mountain. This pass, although not so well known, is much more difficult than either of those we made in the Tyrol, yet we had no difficulty in ascending on our high speed and only had to shift in coming down the mountain, where we were in close quarters with a diligence.

Our next day's run was to Nancy, where we spent the night, and then direct to Paris, about two hundred miles, on the following day. This finished our second tour of the Summer, which in length was somewhat shorter than our first, although it embraced 2,000 miles. Add to these two trips 1,000 miles in England and our trips around Naples and Italy, along the Riviera and about the Italian lakes and it would make in round figures 6,000 miles. At no time did we try to make exceptional speed, journeying leisurely in an endeavor to see the towns as well as the country. We succeeded, too.

For three months prior to taking the Tyrol trip we motored through Europe, starting from Liverpool and doing much of England, which, although intensely interesting, is too well known to Americans who have motored abroad or, in fact, traveled in other ways to call for extended mention. A couple of days in London at the close of the English tour was sufficient to again give us the motor fever, and we drove to Folkestone, crossed the channel to Boulogne, and started at once for Paris.

Along the Seacoast of France.

After a week or so there, during which time we used our motor constantly, we started for an extended trip around the seacoast of France. At Trouville, one of the most popular seashore places in France, we were the only guests at the im-

A narrow Street-Southern France

A Native haycart - Tyrol

In the Tyrol

mense Noire Roches. Nevertheless, we were entertained as graciously as if we had been a royal family and the hotel had been "full up," as they put it abroad, instead of empty.

All of which is characteristic of this country, where good living is counted the chief aim of existence, and where it is a joy to travel. Nowhere in France have I ever found anything but good food and clean beds. In the smallest country village, where apparently there was not a visitor a day at the inn, there would always be prepared the most palatable *dejeuner* on the shortest possible notice, and there were always clean rooms for travelers.

As for Spain—but that is another story.

One incident worthy of mention reflects the sentiment of your Frenchman, be he of high or low rank. At one little place where we stopped for luncheon the *chef* was owner, manager, cook, and grand factotum. He spoke a little English, and informed me that he spent two years in America as *chef* for a well-known Washington family.

What the Chef Said of America.

"America is one gran' country," said mine host, shrugging his shoulders, "but ze people, ah! Zey are w'at you call ze nice people, but zey are not artistic. Zey know not ze value of ze fine cooking, only eat, eat, eat. Cooking is ze fine art, like music an' ze drama, but ze American he does not t'ink so. So I save up my money an' come back here, where fine cooking is appreciated. M'sieur, America is ze gran' country, but I had sooner be ze inn keeper in zis leetle village where ze people know how to eat properly zan wan gran' *chef* in ze Washington."

Only at Mont St. Michel were we doomed to disappointment, and that possibly because our expectations had been pitched too high. The *omelette soufflé* of Madame Poulard is more celebrated through Burton Holmes' lecture than in reality. Better omelettes are made at plenty of places in France and even at home than the present Poulard family turns out. Nevertheless, this interesting spot, now an island, except for the artificial roadway built to it, is well worth a visit.

The hotel here, like the one at Amalfi, Italy, is built away up in the air on rocks, and the climb to get to your bedroom is all the exercise one needs for an entire day. The view, however, is well worth the effort. It is here that the tide comes in faster than a horse can trot, but our guide, seeing we were motorists, tried to flatter us by saying that an automobile could probably beat the tide. We decided not to do any investigating along this line.

The entire trip along the French coast through Brittany, with its quaint villages and quainter natives, and over into Spain, is a journey never to be forgotten, as is the ride through the chateau country of France. The latter part of this trip is through a district where for miles the roadway goes by caves and cellars in the rocks in which wine is stored.

In the Heart of the Champagne Country.

Equally interesting, even to the total abstainer, is a journey through the country around Reims, in the heart of the champagne country, and where many of the most noted manufacturers of this wine have their cellars. We visited those of Pommery, which are reached by a flight of 200 or more steps down into the earth and a walk through tunnels and caves of chalk. We apparently walked a half mile, getting enough of it in this time, but our guide assured us that there were many miles of cellars, taking the upper and lower stories, and that millions of bottles of champagne were stored there.

Volumes could be written on our experiences in France, in Germany, in Austria, in Spain, in the Tyrol, in Italy and in England, but space and time forbid.

When you remember that France alone has 40,000 miles of roads whose equal is seldom encountered in America, and that conditions in the other countries enumerated are much the same, it is not difficult to understand why people who want to motor go as far as Europe.

Touring there is taken much as a matter of course. At Liverpool we met a man just starting out on a drive to Madrid with as much unconcern as though he were simply going from Detroit to Buffalo.

At Jaffa we saw Charles J. Glidden, of Boston, who has motored around the world and was finishing up a 60,000-mile trip, his being the first automobile that ever entered the Holy Land.

One meets all sorts of enthusiastic motorists who eat, drink, and sleep in their cars. To such my little experience will, of course, be of no benefit. But, be he seasoned motorist or amateur, a tour of Europe is bound to possess educational value, not the least as showing Americans the possibilities at home in the way of good roads.

THE AUTOMOBILE CALENDAR

AMERICAN.

Shows and Meetings.

Dec. 31-Jan. 7...—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reeves, General Manager, 29 West 42d St.

Jan. 16-23.....—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. M. L. Downs, Secretary, 7 West 42d St., New York City.

Feb. 6-13.....—Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. S. A. Miles, Manager, 7 East 42d St., New York.

Mar. 7-13.....—Buffalo, Second Annual Power Boat and Sportsman's Show, Convention Hall, Dal H. Lewis, manager, 760 Main Street, Buffalo, N. Y.

Races, Hill-Climbs, Etc.

Oct. 10.....—Providence, R. I., Narragansett Park, Race Meet, Rhode Island, Automobile Club.

Oct. 10.....—Philadelphia, Founders' Week Stock Chassis Race, 195 Miles, Quaker City Motor Club.

Oct. 10.....—Long Island Motor Parkway Sweepstakes, Conducted by Vanderbilt Cup Commission.

Oct. 10.....—Providence, Narragansett Park, Race Meet. Rhode Island Automobile Club.

Oct. 10.....—Morristown, Madison, Chatham, N. J., Automobile Carnival and "Tour Around the World," under Y. M. C. A. auspices.

Oct. 24.....—Vanderbilt Cup Race, Long Island Course, auspices of Vanderbilt Cup Commission.

Oct. 31.....—Philadelphia, Sixth Annual Run of Automobile Club of Philadelphia for the Brazier Cup.

Nov. 26.....—Savannah, Ga., Grand Prize Race, Savannah Automobile Club.

FOREIGN.

Shows.

Oct. 11-18.....—Paris, International Congress and Public Exhibition on Roads and Road Making for Modern Locomotion, French Ministry of Public Works.

Nov. 13-21 .....—London, Olympia, Seventh International Motor Exhibition.

Nov. 28-Dec. 13.—Paris, Eleventh Annual Salon de l'Automobile, Grand Palais, Automobile Club of France (Pleasure Vehicles, etc.)

Dec. 20-28.....—London, Stanley Show, Agricultural Hall.

Dec. 22-29.....—Paris, Eleventh Annual Salon de l'Automobile, (Commercial Vehicles, etc.)

Jan. 16-25.....—Brussels, Show Organized by Belgian Chamber Syndicate, Palais du Cinquantenaire.

Races, Hill-Climbs, Etc.

Oct. 11.....—Berlin, Germany, Gordon Bennett Balloon Race, Aeronautical Club of Berlin.

FIFTEEN OUT OF TWENTY HOOSIERS HAVE PERFECT SCORES

INDIANAPOLIS, Ind., Oct. 3.—The two days' reliability run given by the Indianapolis Automobile Trade Association, Thursday and Friday, developed into one of the worst gruelling contests automobiles have ever had over Indiana roads. Despite this fact, fifteen of the twenty-six cars entered finished perfect.

It had been predicted that not more than 20 per cent. of the cars entered would finish with perfect scores, and this probably had a tendency to keep down the number of entries. The roads were ideal for the kind of contest it was, offering long stretches of good highways where great speed was possible, the highest hills in Indiana to test the hill-climbing abilities of the cars, and sharp turns and dangerous stretches of roads to try the nerve of drivers and to call for most cautious handling of the cars.

The cars were turned over to the technical committee Wednesday afternoon and were parked on the west side of University Park for the night after, having been inspected and sealed. The first car left Indianapolis at 7 A. M. Thursday, and the others followed at one minute intervals.

The run Thursday was to French Lick, a distance of 131.2 miles and the roads were much better than on the return trip, which was 122.2 miles in length.

Practically all of the penalties were for things of minor importance, only one or two of the difficulties were anything that would interfere with the actual running of the car. Loose parts, lost bolts, etc., were responsible for many of the penalties. The following is the table of the run, including nature of penalties:

No.	MAKE	Driver	Class	H.P.	Price	Seals Broken	Penalizations	Final Score
1	NATIONAL	John Aitken	A	50	$4,200	None	None	Perfect
2	NATIONAL	Thos. Kincaid	A	50	3,700	None	None	Perfect
6	MARMON	H. G. Shafer	A	50	3,750	None	None	Perfect
7	MARMON	H. Stilman	A	50	3,750	None	None	Perfect
10	PREMIER	Harry Hammond	W	30	2,600	None	None	Perfect
11	PREMIER	Henry Letsinger	A	30	2,600	None	None	Perfect
12	PREMIER	Miss Elizabeth Love	A	30	2,700	None	None	Perfect
14	PREMIER	Frank Morrison	A	30	2,600	None	None	Perfect
4	STUDEBAKER	F. B. Willis	A	30	3,500	None	Left rear fender loose	2 points
9	AMERICAN	Fred Tone	A	50	3,750	None	Towed to start motor	5 points
8	HAYNES	Robert Murden	A	60	3,750	None	Foot brakes not working	10 points
5	PACKARD	Chas. Stuttz	A	30	4,200	None	Towed to start motor; starting crank bent	11 points
3	NATIONAL	Harry Moore	A	50	3,700	None	Two plates on front spring broken	16 points
18	RAMBLER	Ted Collier	B	32	2,250	None	None	Perfect
19	MITCHELL	Geo. Gastemeau	B	20	1,250	None	None	Perfect
20	MAXWELL	J. A. Newby	B	24	1,750	None	None	Perfect
21	MAXWELL	T. L. Marshall	B	20	1,450	None	None	Perfect
23	CHALMERS	J. H. Stickney	B	30	1,500	None	None	Perfect
24	OAKLAND	Harry Hocker	B	20	1,250	None	None	Perfect
26	CARTERCAR	C. J. Haines	B	20	1,350	None	Nut lost off front spring shackle bolt	5 points
25	PREMIER	Katrina Fertig	B	24	2,250	2	Adjusted coil and carbureter	11 points
17	OVERLAND	Henry Barnes	B	30	1,500	None	Foot brakes not working; towed to start motor	15 points
30	REO	O. G. Myers	C	20	1,000	None	None	Perfect
27	RAPID	Frank Grogan	C	24	2,100	None	Two loose lamps	4 points
29	HASSLER	R. H. Hassler	C	12	650	None	Towed to start motor	5 points
28	MAXWELL	O. J. Gronendyke	C	12	850	None	Reverse not working; carbureter adjusted. Broken secondary wire	19 points

SINGLE-CYLINDER SIZAIRE WINS COUPE DES VOITURETTES

PARIS, Oct. 1.—That it is not necessary to have cars of 120-horsepower to provide a good auto race is proved by the results of the Coupe des Voiturettes, run off last Sunday, over a distance of 248 1-2 miles, near Compiegne. Naudin, on a one-lunger Sizaire-Naudin limited to 100-millimeters (3.9 inches) bore, covered the distance in 5:14:8, being an average of 47 1-2 miles an hour. Although it is not such fast going as was witnessed at the Dieppe voiturette race, the performance is more remarkable, for the Compiegne circuit necessitated at least 200 changes of gear or important reductions of speed for each of its

Of the 17 cars to finish, the first six were driven by single-cylinder engines of 3.9 inches bore. Martini, the only foreign firm in the race, finished seventh, eighth and tenth with four-cylindered cars of 2.5 millimeters bore. At Dieppe the maximum bore for this type of engine was 2.4 inches; even with the extra allowance, however, it was manifest that there was a decided inferiority in power produced by the multiple compared with the single cylinder engines. Martini, however, had the satisfaction of being awarded the special prize for the best performance by cars most nearly approaching commercial models, and of being the only firm besides Sizaire-Naudin to finish with a full team.

Not even the Sizaire-Naudin engineers would maintain that the winning trio corresponded with commercial models. Bore having been limited to 3.9 inches, most firms were content to adopt a stroke of 7 inches; two firms went as high as 7.8 inches, but Sizaire-Naudin took the bold step of lengthening the stroke to 250 millimeters, which to give the exact English equivalent is 9.84 inches. It is the greatest ratio of stroke to bore ever adopted on an automobile, and was, in the opinion of the experts, ridiculously exaggerated; results, however, proved conclusively that the Sizaire-Naudin people were right. To show that the long-stroke motor is the most advantageous, it is only necessary to mention that the order in which the cars finished was in direct ratio to the length of their stroke. Sizaire-Naudin finished first with 9.8 inches stroke, Lion-Peugeot was second with 7.8 inches, Corre and La Joyeuse followed, each with 6.2 inches stroke, and Alcyon was behind with 5.9 inches.

Tire troubles were light, the first six being shod by Michelin. Bosch supplied the high-tension magnetos of the first four cars. No car made use of storage batteries for the supply of electric current. The following is the order in which the 17 out of 31 starters finished the race:

Car.	Driver.	Time.
Sizaire—Naudin,	Naudin	5:14:8
Average 47 1-2 miles an hour. Michelin tires, Bosch magneto.		
Sizaire—Naudin,	Sizaire	5:21:20
Lion—Peugeot,	Goux	5:43:50
Sizaire—Naudin,	Lebouc	5:43:53
Corre,	Collomb	5:47:29
La Joyeuse,	Taine	6:14:49
Martini,	Sonvico	6:19:29
Martini,	Beck	6:19:43
Guillemin Le Gui,	D'Avaray	6:35:13
Martini,	Richard	6:36:16
Guillemin Le Gui,	Riviere	6:39:48
Lion—Peugeot,	Boillot	6:40:39
Alcyon,	Rolean	6:54:48
Werner,	Gaesler	6:57:22
Aries,	Meau St. Marc	7:03:16
La Joyeuse,	Schweitzer	7:03:41
Truffault,	Giraud	7:33:02
Regularity Prize for team work.		Total Time 3 Cars.
Sizaire—Naudin		16:19:21
Martini		19:15:28

THE AUTOMOBILE

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SHAFT-DRIVE NOW UNIVERSAL.

With the advent of the 1909 show season, it is safe to say that a review of the models for the coming season will reveal the fact that there are now very few American makers devoting their energies exclusively to the production of a side-chain driven type of car. The transition from chain to shaft drive has been more or less gradual, but that the process is now practically complete is evident from the capitulation of those designers who have consistently adhered to the chains up to the very last. Nor is their surrender to be regarded as evidence of their conviction that the shaft-driven car is superior; it is but another instance of the fact that the public demand is far stronger than the dictates of technical requirements, or the designer's preference. If buyers will have a shaft-driven car, there can be no alternative than to meet the demand.

In some cases it is noticeable that makers of high-powered cars have abandoned the chain-drive entirely, while in others only the lighter cars turned out are of the shaft type and the chains are still retained on the more powerful models. There is at least one instancce in which the maker has frankly stated that his preference for the chain-driven car is as strong as ever, his bow to the inevitable taking the form of an option to the purchaser on either type. While the shaft drive has not only proven practical from the first, as well as highly desirable from every point of view, the preference for chains on cars above a certain weight and power is very well founded, and it seems doubtful if the chain-driven car will ever disappear entirely. It is quite probable, however, that the shaft will, sooner or later, displace the single chain now employed on some light cars, so that everything below a certain power will be of the now practically universal type.

* * *

CONTESTS WHICH TELL SOMETHING.

In the Coupe des Voiturettes, held in France, a single-cylinder car averaged nearly 50 miles an hour over a course only fairly good. In the so-called "Four-Inch" race of the British club, held over twisting narrow roads on the Isle of Man, the cars averaged fully as well, though several of them were capable of eighty to ninety miles an hour over a real racing course.

Once upon a time—and not very long ago—a "juggernaut" which could travel in and around a mile-a-minute was rated in the top flight of speed. Now a single cylinder can do almost as well. Truly there has been a wonderful advance in the engines of automobiles, and the end is not yet.

Speed competition of the present, to have a practical value, unquestionably tends to contests for limited engines constructed for cars which are suitable for the average buyer, who demands reasonable speed at a reasonable cost. The fastest flight of which an automobile is capable may be seen in the forthcoming Vanderbilt Cup race, with abnormal engines possessing power in excess and which no sane driver will utilize to its full capacity. Having gone far beyond the limits of sanity, it is high time that the hazards of competition be modified to a degree which will bring the sport back to the realms of reason and at the same time make it of value to the purchasers of automobiles. It is probable that the 1908 Vanderbilt race will be the last of its kind, and here's hoping that no catastrophies will mar what should be the most spectacular automobile racing ever supplied.

* * *

SPORT WHICH SADLY BELIES THE NAME.

In the early days of automobiling, when horsepower was both moderate and uncertain, the circular tracks built for horse racing answered fairly well for motor racing. Then, the danger was not excessive. Now, the risk is abnormal. Of slight, if any, worth to the maker or the user, and with faults which outweigh any advantages claimed by its most ardent supporter, the finish of high speed automobile racing on horse tracks is near at hand. A perusal of the accident chapter of the Brighton Beach "24" tells its own story, and if the directors of the A. A. A. accepted the views of its president, William H. Hotchkiss, there would be no further sanctioned racing of this kind by the national body of the country. With the big powered cars driven anywhere near their capacity the danger is beyond the point of sanity. It is either this or just plain "hippodroming"—one is criminal, and the other is "fake" racing. Let us end it—at least in any sanctioned form.

Storm Center of Long Island Motor Parkway, Where Most Complete Arrangements Have Been Made for Contestants and Spectators.

PARKWAY SWEEPSTAKES NEXT, THEN THE VANDERBILT

SIXTEEN entries are known to have been made for the Vanderbilt Cup race. It may be that the resolution of the Racing Board as to those drivers that competed in the unsanctioned meet at Brighton Beach on September 11 and 12, particulars of which are set forth elsewhere in this issue, may reduce the present list by one or two, or perhaps, which is more probable, result in an increase should the suspended ones make their peace with the racing authorities. Pending the readjustment of the standing of the outlaw pilots, the Vanderbilt Cup commission has delayed making public the exact status of the entry list for the Long Island classic.

The nominations for the Vanderbilt race now amount to 10 American and six imported cars, the previous entries being made up of three Mercedes, two Knoxes, a Matheson, a Brasier, a Mora, a Chadwick, an Acme, a Thomas, an Isotta and a Renault.

The Vanderbilt Cup Commission offices have been removed from Manhattan to the Garden City Hotel, where Chairman Thompson will make his headquarters until after the race. Reservations for seats, boxes, and parking spaces may be obtained at the city offices of the Commission, 437 Fifth avenue.

Indications point to a big novel, and interesting struggle for the Sweepstakes, which will inaugurate racing on the Long Island Motor Parkway next Saturday. The course was so far completed that daylight practise over it began yesterday.

The cars will be started with the lowest-priced cars in the lead followed by the other classes in price order, the order of the start of the various sweepstakes being Nassau, Jericho, Garden City, Meadow Brook, and Motor Parkway. Each car will bear the initial of its own particular sweepstakes.

Hartford Club at the Vanderbilt Cup.

HARTFORD, CONN., Oct. 5.—The Automobile Club of Hartford has abandoned all hope of conducting either a hill climb or a 24-hour race this Autumn. Inasmuch as the Vanderbilt Cup race is almost due, it was deemed expedient that that event furnished enough excitement for the club members. A large delegation from the local club will visit the Cup race, and a good parking space has been secured that will accommodate about 50 cars near the grandstand. The Hartford delegation will have their own tents, and breakfast will be served on the grounds.

SUSPENDED DRIVERS GET ANOTHER CHANCE.

Action in the matter of drivers who competed in the unsanctioned meet at Brighton Beach, September 11 and 12, was taken by the A. A. A. Racing Board at a meeting held last Saturday. Previous to their participation in the races in question, all drivers were notified that their competition would mean disqualification. Since the race, however, several of the suspended drivers with mounts in prospect for the Vanderbilt and Sweepstakes have declared that they competed under a misapprehension. The Board leniently decided to take them at their word and give them a chance to start anew with a clean slate by the adoption of the following resolution:

WHEREAS, Various persons have participated in races coming within the jurisdiction of the American Automobile Association, but for which no sanctions had been granted by that association, and, whereas, it appears that from the statement of some such persons that they participated in the said races under a misapprehension; be it

RESOLVED, That in the cases of such participants as were under the misapprehension referred to, their disqualifications pursuant to the rules of the Racing Board of the American Automobile Association, be suspended to the extent of enabling them to participate in any race already sanctioned by the Racing Board, upon such persons filing a statement to the effect that they shall not hereafter participate in any manner or form in any race claimed by the association to be within its sole jurisdiction and for which no sanction has been granted by the Racing Board of the American Automobile Association.

FOURNIER IS TO DRIVE AT SAVANNAH.

Quite a batch of foreign entries were received by the Automobile Club of America before the preliminary nominations closed last Thursday. Most noteworthy to Americans was the fact that Henri Fournier, who inaugurated high-speed sprinting in this country on the Coney Island Boulevard by setting up an initial world's mile record of 51 4-5 seconds, and won the Paris to Berlin race, would resume racing and return to this country to pilot one of the two Itala cars named by the Italian club. The other will be driven by Cagno.

Hautvast will pilot one Clement-Bayard, and Rigal another, while Szisz will once more be at the wheel of a Renault.

The complete list of entries to date, with another month yet to come before entries finally close, consist of the following: Fiat, Nazarro; Fiat, Wagner; Fiat, De Palma; Benz, Hemery; Benz, Hanriot; Benz, Earle; Mercedes, Salzer; Mercedes, Poege; De Dietrich, Duray; Clement-Bayard, Rigal; Clement-Bayard, Hautvast; Renault, Szisz; Itala, Fournier; Itala, Cagno; B. L. M., R. W. Buckley; American Locomotive, L. J. Bergdoll; Matheson, foreign driver; Acme, Patschske or Rodgers; Lozier, Michener.

The Savannah light car race has 14 entries to date, consisting of two Gyroscopes, three Maxwells, three De Dions, three Buicks, an American Aristocrat, a Chalmers-Detroit, and a Cameron. The latter is an air-cooled car from which great results have recently been obtained.

Maxwell 12-Cylinder 180-Horsepower Racing Car.

This powerful racing craft at Ventnor Beach, near Atlantic City, N. J., October 1, covered a mile in :31 1-5 seconds, at the rate of 116 miles an hour.

CANADIANS GREET AUTO RACING WARMLY.

MONTREAL, Sept. 28.—Canadians were given their first automobile track meet last Saturday and Sunday at Delorimier Park half-mile track. It was held under the auspices of the Automobile Club of Canada. R. M. Jaffray, promoter of the Montreal show, managed the meet for the club, though efficient assistance was rendered by President Duncan McDonald and Secretary George A. McNamee.

That Canadians are alive to the competitive possibilities of the automobile and are eager to patronize motor car racing is proved by the attendance on Sunday reaching 16,000 paid admissions.

The record trials and competition of Barney Oldfield and Charles Soules with Barney's Stearns "six" and "four," Walter Christie, and Charles Burman with the McLaughlin Buick were the chief crowd-drawing attractions. Christie showed a mile in 1:10; Soules, 1:14, and Oldfield, 1:15. Christie also made a half mile in 34 seconds. Burman made practically a clean sweep of the open stock car events, in which he was eligible to compete. The five-mile championship of Canada for 20 to 35-horsepower cars fell to L. D. Robertson's Comet, in 6:44. Robertson also beat Tedford, Stearns, in a mile match in 1:19.

DETROIT DEALERS TO PROMOTE 3 DAYS' TEST.

DETROIT, Oct. 6.—With the success of last year's event still in mind, the Detroit Automobile Dealers' Association has planned a far more difficult endurance run for next month. November 5, 6 and 7 are the dates set. The first day's run will be to Saginaw and back. The second day the course will be triangular, Adrian and Jackson being included, with Detroit as the terminus. The third day's run will be to Lansing and back.

Each night all cars will be parked in the streets near the Hotel Tuller, a strict guard being maintained. Oil and gasoline will be furnisbed under inspection, and at the end of the tbird day's run a committee will make a technical examination of each car to determine exactly what it has accomplished, each observer's report also being taken into consideration.

Entrants have been divided into three classes, the handicapping system providing for the smaller cars to start first, medium-powered ones later, and the largest ones some time after. Several valuable trophies have been offered by the Detroit Auto Dealers' Association as prizes.

CLEVELAND RELIABILITY POSTPONED.

CLEVELAND, Oct. 5.—The Cleveland Automobile Club decided to postpone its three-day reliability run, scheduled for October 7, 8, and 9, because of a conflict in dates with the contest of the Chicago Motor Club. There is a possibility that it cannot be held until the first part of November.

FRENCH MOTORDROME IN CHATEAULAND.

PARIS, Oct. 1.—France has been considering the advisability of a permanent racing course for three years, and is still considering. At the present moment the Auvergne track has fallen back a little in popular estimation, for it has been discovered that the ideal spot is in the Chateau country, by the banks of the limpid Vienne river, near Tours, and in the neighborhood of Azay-le-Rideau and Chenonceau.

The proposed course has been visited by a commission of the Automobile Club of France and pronounced to be all that can be desired. Geographically the situation is excellent, the course being in the Garden of France, in a land of good roads, and with adequate railroad facilities. After running along the banks of the Vienne, the proposed course skirts the Ruchard camp and the Chinon forest, giving a total distance of 12 to 18 miles as desired, without any railroad or cross road. The land being on a low hillside, the course would have gentle grades with absolute straightaways of four to five miles. The financial aspect of the question remains to be discussed. Local opinion is strongly in favor of the scheme.

A NEW 200-H.P. RIVAL FOR DIXIE II.

PORTCHESTER, N. Y., Oct. 5.—There is now nearing completion in the shops of the Jencick Motor Manufacturing Company here a new six-cylinder vertical 200-horsepower motor of the automobile type, which has been designed to form the power plant of the *Richard Croker, Jr.* The hull is being built by Herreshoff, at Bristol, R. I., and the boat when completed is to be pitted against the *Dixie II.* at the motor boat races to be held at Palm Beach next Winter. The motor has been designed by Stephen Jencick, and the builders are to receive a liberal bonus, over and above the contract price, for bringing its total weight down to 1,800 pounds, which, however, must be done without sacrificing strength or ability to run under full load for an extended period. One means of doing this is to be found in the employment of McAdamite for the crankcase; other features of note are the use of Hess-Bright bearings on the camshafts, and the triplex plunger pump provided to circulate the cooling water.

A NEW PITTSBURG-PHILADELPHIA RECORD.

PHILADELPHIA, Oct. 2.—George Salzman last Saturday in a Thomas light six succeeded in beating by nine minutes the previous record between Pittsburgh and Philadelphia of 14 hours 1 minute, held by S. D. Waldon, in a packard "30," carrying five passengers in all. Salzman's elapsed time was 13 hours 52 minutes. He claims, however, an actual running time of 11 hours 37 minutes, setting up 2 hours 33 minutes loss of time, due to gasoline and tire troubles, toll gates and misdirections.

The 76-mile run from Lancaster to Philadelphia was made in a dense fog. Four and a half miles were added by going to York by way of Hanover and three more by misdirection on the Littleville road, making 7 1-2 miles in excess of the Packard run of 302.4 miles, or 309.5 miles in all covered by the Thomas.

FORT GEORGE HILL CLIMB, SATURDAY OCT. 17.

The New York Automobile Trade Association has decided to hold a climb up Fort George hill Saturday, October 17. President Frank Eveland has appointed Richard Newton, Charles P. Skinner, C. H. Larson, and Walter R. Lee a contest committee to formulate the rules and conditions which will be in force. The proposal is that the classes be divided not only as to the cost, but also as to horsepower, which should bring about some close races.

BRITISH CONCERN ADOPTS KNIGHT MOTOR.

LONDON, Oct. 1.—The Silent Knight patents, which were adopted by the Daimler Motor Company, have also been arranged for by Minerva Motors, Ltd., for 1909.

DRAWING FOR SPACES IN "PALACE" SHOW.

Applicants for space in the Grand Central Palace show were scheduled to draw for their spaces to-day, the A. M. C. M. A. members in the morning, and the others in the afternoon. Space allotments for the importers have already been determined upon and made. When the applications for space closed on October 1 over 100,000 square feet had been applied for, and only 70,000 square feet are available for exhibition purposes.

At the session Tuesday the Regal Motor Car Company, of Detroit, was admitted to membership.

The question of international racing rules was referred to the contest committee with power to make recommendations.

In attendance at the meeting were: Chairman Benjamin Briscoe, Maxwell-Briscoe Motor Co.; James Couzens, Ford Motor Co.; C. G. Stoddard, Dayton Motor Car Co.; R. M. Owen, Reo Motor Car Co.; H. O. Smith, Premier Motor Mfg. Co.; Charles Lewis, Jackson Automobile Co.; S. H. Mora, Mora Motor Car Co.; W. H. Van Dervoort, Moline Automobile Co.; G. Vernor Rogers, Mitchell Motor Car Co.; and Alfred Reeves, general manager.

WILBUR WRIGHT WINS A $100,000 CONTRACT.

LE MANS, FRANCE, Oct. 6.—Wilbur Wright to-day carrying a passenger remained in flight for 1 hour 4 minutes 29 seconds, thus fulfilling all conditions of the contract signed by him and Lazare Weiller, representing a syndicate, which agreed to pay Mr. Wright $100,000 in return for patent rights in France and the colonies. The condition required two flights within a week with a passenger, for at least a distance of 50 kilometers.

Record Balloon Ascension Lasting 37 Hours.

PARIS, Oct. 6.—The 1908 Grand Prix race, organized by the Aero Club of France, to-day was won by Georges Blanched, who, in the balloon *Centaure*, completed an ascension lasting 37 hours, thus winning a cash prize of 1,500 francs and various medals and objects of art. He traveled exactly 550 kilometers, and landed near Allois.

TO TEST NEW JERSEY'S AUTOMOBILE LAW.

PATERSON, N. J., Oct. 5.—Frederick J. Kane, of Woodhaven, L. I., driving a Packard automobile which did not carry a New Jersey registration number, this afternoon, was arrested for a violation of the present Frelinghuysen law. The case is the test case planned by the Associated Automobile Clubs of New Jersey, and when arraigned before Recorder Carroll, Mr. Kane was represented by former Attorney-General John W. Griggs. The hearing was set for October 19, after which the case will be taken to a higher court. Under the present law, though an owner may be registered in his home State, he is also required to do likewise when he enters New Jersey.

AUTO MAKERS INVADE CARRIAGE EXPOSITION.

This week the annual exposition of the Carriage Makers' Association has been in progress in the Grand Central Palace, New York City, and one of the first things noticed by visitors is the fact that no less than fourteen different makes of automobiles are on exhibition. The following cars are exhibited: Rambler, Ford, Autocar, Gyroscope, Marmon, Glide, and Brush; and the Holsman, Anderson, Economy, Reliable, Dayton, Schacht, Kiblinger, and Mallon buggyabouts.

WHITE MOUNTAINS TOURISTS INCREASING.

BRETTON, N. H., Oct. 5.—The great and growing popularity of the White Mountain region as a touring district is evidenced by the number of cars registering at the Bretton Woods garage. In 1907 there were registered 800 cars. This year the increase has been nearly 50 per cent., for the number rose to 1,137 for the present season. With the low estimate of four passengers per car, it means that at least 3,200 people toured to Bretton Woods in 1907 and 4,548 in 1908.

NORTHERN MERGED INTO E-M-F COMPANY.

DETROIT, Oct. 5.—During the past few month much gossip has been in circulation concerning the proposed disposal of the Northern Motor Car Company. The reports have been very conflicting, but it is now announced directly from the Everitt-Metzger-Flanders Company that it has taken over the Northern concern in its entirety; the two factories at Detroit and Port Huron and the cars now on hand—about 100 of the two-cylinder models. The capital stock of the Everitt-Metzger-Flanders Company has been doubled, so that it is in the million-dollar class.

Walter B. Flanders, general manager of the E-M-F Company, states the the acquisition of the Northern will in no way change the plans of his concern. "Except we'll be able to increase our output and inaugurate a plan I have long wanted to put in force. That is, a separate factory for the production of replacement parts for all previous models of Wayne and Northern cars, as well as for all future E-M-F models."

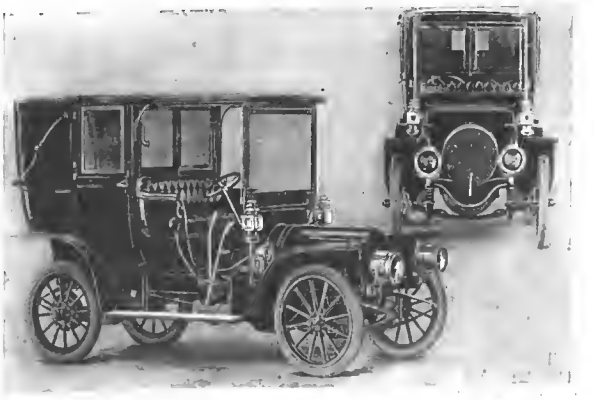
DYNAMO RUSHMORE IS ON THE WARPATH.

PLAINFIELD, N. J., Oct. 5.—Samuel W. Rushmore, he of dynamo fame, has all Plainfield by the ears through his novel and aggressive campaign against what he claims to be his outrageous tax assessments. He has raised above his factory a conspicuous illuminated sign depicting a ring politician with hat cocked on one side, cigar atilt, and monster diamond pin. The sign bears the legend: "Tremendous Taxes for easy Plainfielders. Easy taxes for men in the ring. Rushmore tax books for 'Who's Who, and Why.'"

For the past three weeks Mr. Rushmore has had five men copy the Plainfield tax registers for his "Who's Who, and Why."

FRANKLIN TO SPECIALIZE ON CLOSED CARS.

Up to the beginning of the present year, the builders of the Franklin air-cooled cars have devoted little or no attention to the construction of closed bodies for their cars, although for several years past they have maintained a complete body-building shop as a part of their automobile plant. For the coming season, however, they have decided to bring out five closed models, one of which will be an inside-driven brougham for two passengers, on the 18-horsepower, four-cylinder chassis, to list at $2,250, and a six-passenger special town car, to be known as Model K-2, which will have as its foundation the special Franklin cab chassis. This is also equipped with an 18-horsepower motor, designed for the hardest kind of town and suburban service. The other two models are both of the landaulet type, one, a four-passenger 18-horsepower car, probably being the smallest of its kind on the market; it lists at $2,500, while the larger car of the same type is equipped with a 28-horsepower motor and lists at $4,000. The limousine will be the largest closed car of the Franklin line and will be built on the six-cylinder, 42-h.p. motor.



Side and Front Views of 1909 Franklin Model D Landaulet.

News in General

Two of the Motor Parkway Sweepstakes Performers.

The first to establish headquarters for the Sweepstake events which are to take place this Saturday at the opening of the Long Island Motor Parkway, was the Dayton Motor Car Company, which secured quarters at the estate of Albert Gifford, at Westbury. The camp is in charge of Joseph Tracy.

Will Outlast a Locomotive.—"Given no more than the ordinary care by the average owner a Pierce Arrow will outlast any locomotive in use to-day," says J. L. Osgood, a consulting mechanical engineer of Buffalo. Continuing, he said: "I know the Pierce cars thoroughly, and I have had more or less to do with them since the first ones were manufactured, and in saying this I do not make any qualifications of any kind. Locomotives are, of course, subjected to strains, but these are more than offset by the road strains automobiles are called on to withstand in ordinary usage. For instance, one of the strains that tells most on a locomotive is encountered when it rounds a curve at high speed. Even then, however, it has the advantage of a banked track. The automobile encounters sharper curves and has to negotiate them on an almost level roadway. Again, the locomotive is in the hands of a trained mechanic, while the automobile is often driven and cared for by a man who has only a superficial knowledge of machinery and its needs. Yet, with all the advantages of care a locomotive has over an automobile, the latter will outlast the former, and I have no hesitancy in saying that a Pierce Arrow should give good service for fifteen years."

"Rapid" Trucks in Demand.—The reports from Pontiac, Mich., the home of the Rapid Motor Vehicle Company, makers of commercial vehicles, shows that this company is making great preparations to handle its business for 1909. Besides the new additions that are just being completed, the company is starting work on an office building to take care of the increased business in that part of the organization, and H. G. Hamilton, the general manager, says that if the orders continue to come at the present rate they will soon have to start on another factory. W. A. Sommerville has been added to the staff as advertising manager, and T. P. Myers, formerly of the advertising department, has been made general sales manager.

Herreshoff Motor Company.—The Herreshoff Motor Company is the title of a new concern just established in Detroit to undertake the manufacture of automobiles. C. F. Herreshoff, one of the sons of the famous yacht designer, and until recently engineer in charge of the American & British Manufacturing Co., Bridgeport, Conn., is the head of the new company and will probably give his name to the product. The latter is to consist of three cars, a 22, 25 and 40-horsepower machine, the power plants of which will probably be built in Bridgeport. The new cars will doubtless be revealed in the East for the first time at the coming show of the A. M. C. M. A., in the Grand Central Palace in January.

Motorcycle Makers Organize.—The importance of the motorcycle has increased until there are at present more than twenty manufacturers of two-wheelers in this country. The makers now come out with the announcement that they have gotten together and organized under the name of the Motorcycle Manufacturers' Association, with everything pointing to the election of George M. Hendee, of Springfield, Mass., as president. The new association appointed a show committee at its first meeting and plans are already under way for a complete exhibit of motorcycles at the Madison Square Garden show in January, with the Chicago and Boston shows to follow.

Rambler Makes Long Run.—A Rambler Model 34-A, driven by "Sandy" Dunlop, of Salt Lake City, arrived in Chicago last week, having made the 2,018-mile trip over the difficult roads in ten days without any serious trouble. The car is owned by J. A. Pollack, of Salt Lake City, and they are now on the return trip, going by way of St. Louis and the Southern route. On the trip eastward they averaged better than 190 miles a day, which is rather exceptional, especially through Wyoming, where the roads were in bad shape from the recent rains.

A New "Show Me" Country.—According to Sales Manager Churchill of the Winton Company, the original "show me" country is on the Pacific Coast, and not Missouri, at least as far as the automobile trade is concerned. Mr. Churchill is now on his annual trip to the Coast, and finds trade there large and growing fast; that the Winton Sixes have taken to the hard work along the coast in fine shape and feels perfectly satisfied that his company is getting its full share of Western buyers.

New Licenses in Ohio.—The new automobile license law of Ohio has now been in effect for over three months and Registrar F. H. Caley reports that he has collected $51,470.10, of which $33,470.10 goes to the State for general revenue fund and $18,000 is retained to pay the expenses of the administration until January. Licenses have been furnished to 9,639 owners, 1,549 chauffeurs, and 146 manufacturers and dealers. This seems to indicate that over 8,200 owners drive their own machines.

New Facilities for the Speedwell Company.—The shipping department of the Speedwell Motor Car Company has always had trouble because of the lack of railroad conveniences near the factory, but this is now being remedied by a spur track which is under construction from the New York Central tracks. Along with the other many improvements which the company is making they will soon have one of the best equipped factories in Dayton.

Loziers Used "Hess-Brights."—It is worthy of note that not only did both the Loziers, in the September meeting at Brighton, use Hess-Bright ball bearings throughout, from crankshaft and camshaft to gearbox and both axles, but out of the five cars making the best mileage four were on "Hess-Brights."

Chief Croker Orders an Acme.—Coridon & Flinn, the New York City agents for the Acme, report that Fire Chief Croker has put in his order for an Acme Sextuplet. Chief Croker has found that it has been a great help in his work to have a machine that could answer fire alarms without delay.

New Ford Plant?—It is currently reported in Philadelphia that the Ford Motor Company has bought a 400-acre tract of farm land and meadow at Cold Spring (near Cape May), N. J., upon which it will build large factories and a speedway for testing purposes.

Harris Oil at Brighton.—The winning Simplex used Harris oil in the recent 24-hour race at Brighton Beach. The problem of lubrication is an important one at any time, but doubly so for any car engaged in a speed contest.

IN AND ABOUT THE AGENCIES.

Ajax Tires, Philadelphia.—Taking advantage of its ideal location for viewing the Founders' Week parades, Manager "Joe" Keir, of the Philadelphia branch of the Ajax-Grieb Rubber Company, at 316 North Broad street, has erected a grandstand in front of the store, and has issued complimentary tickets therefor to all users of Ajax tires in Philadelphia. As this is the branch house's opening week, this novel idea of showing courtesies to visitors is a peculiarly happy one, especially in view of the fact that grandstand seats are being quoted at almost prohibitive prices.

Pierce Arrow, Philadelphia.—The new home of the Pierce Great Arrows in Philadelphia, provided by the Foss-Hughes Motor Car Co. at the corner of Broad and Race streets, has just been opened up with everything ready for the proper handling

New Store of Foss-Hughes Motor Company, Philadelphia.

of the 1909 trade. On the first floor ample show room has been provided with the offices of the company on the second floor.

Kissel Kar, New York.—The Apthorp Motor Car Company, of which F. S. Dickinson is the president and treasurer, has closed a contract with the Kissel Motor Car Company to handle its product in New York and vicinity. A salesroom, opened at 2230 Broadway, will be connected with the garage around the corner on West Eightieth street.

Kissel Kar, Minneapolis.—Among the interesting changes in the Minneapolis trade comes the news that Roy Maxfield has purchased the interests of the Rice Bros. in the firm of Maxfield & Rice, and will continue in the automobile trade at 1401 Hennepin avenue under the name of the Maxfield Company. The Kissel Kar and the Mason lines again will be carried.

Stearns, Pittsburg.—The property formerly owned by the Colonial Automobile Company has been bought by a new concern backed by several of Pittsurg's influential business men, with O. T. Bowman as manager. This company will handle the Stearns car and probably a line of electrics and smaller gasolene machines.

Oakland, Indianapolis.—Preparations are now under way in Indianapolis for an agency which will handle the Oakland cars exclusively. The Independent Automobile Company has been organized and rooms leased at 216 East Vermont street, where a complete line of cars will be on hand.

Stepney Spare Automobile Wheel, New York.—The American Stepney Spare Wheel Company, Eastern distributers, have removed to 1773 Broadway from 341 Fifth avenue, and in new quarters is most comfortably located.

Rambler, Boston.—Manager Charles, of the Thomas B. Jeffery & Co., Boston branch, is preparing to move from the quarters occupied by the Rambler for years on Columbus avenue, to a new and larger store at 95 Massachusetts avenue.

Pennsylvania, Newark, N. J.—The J. M. Quimby Company has just closed a contract with the Pennsylvania Auto-Motor Company, of Bryn Mawr, Pa., to act as distributer of its cars in New York, New Jersey and vicinity.

Rambler, Kansas City.—The Rambler Automobile Company of Kansas City, Mo., has been incorporated and will open up a garage at 1116 East Fifteenth street, in the building formerly occupied by the Midland Company.

Winton, Tacoma.—The Winton Motor Carriage Company has established an agency in Tacoma, Wash., with F. H. Faber, who will open up a model garage and devote his time to the Winton.

Diamond Tires, Detroit.—The Detroit branch of the Diamond Rubber Company will move October 15 to the old quarters of the Cadillac retail department, corner Jefferson and Brush streets.

Oldsmobile, Philadelphia.—The Philadelphia branch of the Olds Motor Works, at 231-233 North Broad street, has been opened, with William T. Taylor as manager.

Gaeth, Pittsburg.—The Arlington Motor Car Company, of Pittsburg, has been appointed agent for the Gaeth car for Western Pennsylvania.

PERSONAL TRADE MENTION.

E. LeRoy Pelletier, advertising manager of the E-M-F Company, will also take care of the advertising for the Studebaker Automobile Company, which it will be remembered purchased one-half of the output of the Detroit concern—6,000 cars—and assumed control of all the Western and Southern territory. This brought the two firms into such close relations that it was thought advisable to have all of the advertising in the hands of one man, so Mr. Pellitier will conduct the campaign for Studebaker commercial wagons, electrics, etc., as well as for the E-M-F.

"Governor" Fred E. Castle has resigned from the position of sales manager for Gray & Davis, and is now considering several promising propositions in which his trade experience of fifteen years, first in the cycling and then in automobiling, may be utilized to the best advantage. Mr. Castle has a wide and valuable acquaintance in all parts of the country, and his friends believe his next business affiliation will be a significant one. For the present he will continue to make his headquarters in Detroit, Mich.

Albert C. Galbraith has accepted a position with the Diamond Rubber Company, and will travel in New England from the Boston branch. He was formerly connected with the Fisk Company in its Pennsylvania, Maryland and Virginia territory.

G. C. Miller, formerly secretary for the superintendent of police of Buffalo, has been appointed sales manager of the Kane Motor Supply Company, of that city, with offices and show rooms at Ellicott and Tupper streets.

Forbes S. Dey, well known to the trade as "Teddy" Dey, and associated with the George N. Pierce Company, of Buffalo, for the past twelve years, has been appointed agent for the Pierce Arrow at Kansas City, Mo.

Charles E. Worrell, formerly with the Waverley branch of the Pope Motor Car Company, has accepted a position with the sales department of the Overland Automobile Company, of Indianapolis.

P. C. Nelson, formerly of the Electric Vehicle Company, has gone with the Newark branch of the Packard Motor Car Company, where he will be connected with the sales department.

James B. Strawbridge was elected general manager and treasurer of the Cleveland Motor Car Company at the recent meeting of the board of directors in New York City.

BOSTON TRADE CHANGES.

BOSTON, Oct. 5.—The first of the month saw a number of notable changes in the local trade. Prominent among them was the removal of the New England branch of Thomas B. Jeffery & Co., from Columbus avenue to No. 93 Massachusetts avenue, the store formerly occupied by Morrison & Price. In his new quarters Manager V. A. Charles has a commodious and well lighted salesroom with ample facilities for storage of parts and making repairs.

The old Rambler store on Columbus avenue has been taken by the Firestone Rubber & Tire Company, which formerly occupied a store in Park Square. Manager T. H. Glenn is making extensive alterations.

The New England Peerless branch has also made a change, but Manager John L. Snow is still satisfied with Columbus avenue as a location. He has taken the store next door to his old salesroom and has made a most attractive salesroom. He also retains a part of the old store for offices, renting the rest to Alonzo G. Peck, the veteran Columbia bicycle agent.

John H. MacAlman, formerly manager of the Columbia branch, now acting as agent for this car, has been deprived of a part of his quarters on Stanhope street, the garage and repair shop having been taken by the electric lighting company, which is fitting up a new garage for its own uses.

On Boylston street the Kissel Kar Company is about opening a store in the quarters formerly occupied by H. C. Stratton & Co.

J. W. Maguire & Co. has doubled the size of its salesrooms by taking down the partition between his old store and that next door, formerly the Napier headquarters.

ROYAL CO. REORGANIZED.

CLEVELAND, Oct. 6.—The Royal Motor Car Company, of this city, has been reorganized after many months of hard work upon the part of a committe of creditors working under the direction of United States Judge Taylor and F. A. Scott, of the Superior Savings & Trust Company, receiver, and in a short time will place upon the market a new model.

The first cars of a new model are now almost completed, and in a short time will be ready for the inspection of the public. The first of the new models to be turned out will be a four-cylinder 55-horsepower touring car, very similar in general appearance to the well-known model G. The Royal people have also been working upon a six-cylinder model of about the same horsepower, and have assembled such a car, it is said, but this model will not be put upon the market this fall.

The generous attitude of the majority of creditors was what made possible this reorganization. The concerns represented by these men have believed ever since the failure that the Royal would pull out of its trouble if given a little aid and help. In support of this attitude, the creditors' committee has been doing yeoman service in an effort to bring something tangible out of the chaos into which the Royal Company was plunged, and the net result is the reorganization.

VETERAN DEALER A BANKRUPT.

Charles A. Duerr & Co., agent in New York for the Royal Tourist and Moon cars, have filed an involuntary petition in bankruptcy, with liabilities of $100,000 and nominal assets of between $65,000 and $75,000. Lindsay Russell has been appointed receiver.

William B. Cooley.

President of the new Waverley Company, and successor to the Popes in the management of the Waverley electrics. The Waverley Company recently purchased the Waverley plant of the Pope Motor Car Company, and Mr. Cooley is one of Indiana's most prominent business men. Associated with him are about a dozen of the best known capitalists and business men of Indianapolis.

INFORMATION FOR AUTO USERS

Break Circuit Auto Lock.—As its name implies, this is a device for locking either an electric or gasoline car, operating directly in the power circuit in the former case and on the ignition in the latter. It is being manufactured and marketed by

BREAK CIRCUIT LOCK FOR GASOLINE CARS.

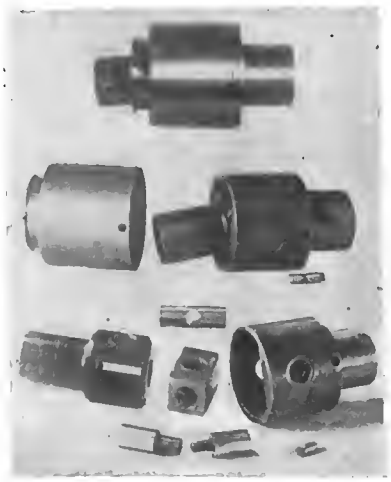
the Safety Device Company, 372 South Illinois street, Indianapolis Ind. When the switch bar of the lock is pulled forward it breaks and locks the circuit automatically, so that no connection can be made until one of the two keys furnished with the Yale lock is inserted and given a half turn, the switch bar then automatically springing back into place. In the case of an electric vehicle, the lock is installed beneath the upholstering on the arm of the seat so that only its face is visible. It takes the place of the ordinary cut-out or plug, and a valuable additional feature is to be found in the fact that on an electric, should it be found impossible to shut off the current to stop the car in any other manner, pulling out the switchbar of the lock will accomplish this.

On a gasoline car it is applicable to any system of ignition, whether with single or double sets of batteries, battery

BREAK CIRCUIT LOCK FOR ELECTRICS.

and magneto, etc., and in the latter case the Break Circuit Auto Lock takes the place of both the switches otherwise necessary. The switch lever of the Auto Lock may be thrown from one set of batteries to the other, or from battery to magneto, but when pulled forward it breaks the circuit completely. The lock is installed on the face of the coil box and once in place there are no exposed binding posts or wires. All necessary fittings and wiring are supplied with the Auto Lock. The latter is furnished in brass or aluminum as desired.

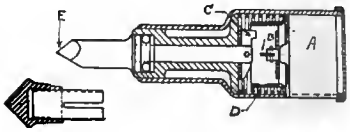
K-B Type "E" Universal Joint.—The Kinsler-Bennett Company, of Hartford, Conn., has designed and are manufacturing a new universal joint to meet the requirements of shaft-driven automobiles of the light and medium type, or for use on motor boats. It is strong and simple, being composed of but few parts. The body is a casing into which is inserted a hardened steel bushing. The sleeve, or yoke, has a rectangular opening which holds the steel block, the joint being held together by a three-quarter-inch steel pin, thus making it sufficiently strong. All working parts have been carefully hardened. To keep the joint free from dirt a steel cover, held in place by a spring plug, slips over the outside,



K-B TYPE E UNIVERSAL, DISASSEMBLED.

and besides this there is a leather boot which fastens to the cover and straps to the propeller shaft. The outside diameter of the joint all assembled is three and a quarter inches. This same concern is also introducing another similar universal for use on low-priced runabouts, known as style D.

New Veeder Speed Indicator.—The Veeder Manufacturing Company, of Hartford, Conn., has just put on the market a new speed indicator which has some new and valuable features. The counter, which occupies the space marked A in the accompany drawing, is the same that has been in use by this company for years, and will operate equally well in either direction. The feature about this new indicator which makes it of especial value is the clutch, shown at B and C, which permits the user when taking the revolutions of a rotating shaft to place the point E in position on the end of the shaft, and with his watch in the other hand, put the counter in operation by pressing in against the spring D at any time he desires. The spring D holds the two parts of the clutch separated unless the pressure of the hand brings them together. This operation is made easy by the ball bearing thrust which has been provided. No matter in which direction the shaft turns, the difference of these two readings will be the r.p.m., if the time has been one minute. The indicator is not effected by a magnetic field; this coupled with the fact



SECTION NEW VEEDER SPEED INDICATOR.

that it works equally well at high or low speeds, makes it adaptable for motor and generator use.

"Trimo" Monkey Wrench.—Under this head the Trimont Manufacturing Company of Roxbury, Mass., one of the oldest and largest manufacturers of wrenches in the United States, has brought out a wrench especially designed to meet the needs of the automobile owner. It is made up of only three parts which are all drop-forgings of special steel and case-hardened. In the accompanying cut the three parts are clearly shown; the handle, the movable jaw, and the nut. The movable jaw is slotted from the head back to the end of the screw so that it slips over the narrow

SIDE VIEW TRIMO MONKEY WRENCH.

portion of the handle and the nut screwed on as shown, with a plug and pin to keep the nut from being screwed back too far while in use. The makers are putting this new design on the market in six different sizes, from six inches up, with larger ones to follow. The same firm have also put out a pipe wrench of a similar design.

Sager Easy Spring.—The J. H. Sager Company, of Rochester, N. Y., the makers of the Sager equalizing spring, has just brought out a new design intended for use on runabouts or any car having stiff semi-elliptic springs. In the accompanying cut the coils spring is shown attached to a

SAGER EASY SPRINGS IN POSITION.

Mitchell runabout, showing how the spring holder is attached to the rigid part of the frame, which the company claims does away with any side motion that tends to take place. On account of the coils being more sensitive than the flat springs the [illegible] of the road are taken by them, [illegible] the resistance of the coils equals [illegible] flat they will work together.

Vol. XIX New York—Thursday, October 15, 1908—Chicago No. 16

THE AUTOMOBILE

Long Island Motor Parkway Has Its Racing Initiation

BY a monster speed carnival, in which all previous American road records were surpassed and stock cars of many makes scored amazing figures in an automobile battle-royal, the Long Island Motor Parkway was inaugurated Saturday, October 10, as a racing course, whereon for all time, without breaking any laws and with safety to contenders and spectators, automobiles may be driven in competition or for pleasure. The assured and partially realized establishment of this great auto speedway and parkway, the results of Saturday's contests, and the possibilities of the course as a trial ground mark the beginning of an era that will mean much to the advancement of the American industry and the popularity of the automobile as a high-speed pleasure vehicle. The successful

Lytle and Winning Isotta Ascending One of the "Hills" of the Parkway Stretch Where the Main Highway Is Crossed.

initiatory of the parkway also gives promise, in the class of the contenders and in the comparative speed results, of a Vanderbilt race on October 24 that will mean no loss of prestige to America's great classic road race.

The outcome proved the practicability of the innovation of combining several contests among variously graded machines at different distances, and also set a fashion that is likely to be frequently followed in future long-distance stock car races on the road. Endurance runs, under varied or average highway conditions as tests of serviceability, and hill climbs, as proof of power under grade emergencies, are convincing to many, but it is doubtful whether the arbitrament of sustained speed over long distance does not appeal most strongly to the majority. This has been European experience. The selling success that has followed notable speed successes in this country would seem to confirm to a considerable extent the European ideas. Hitherto it has been sought to supply the fancied want by track contests, but their practical results have paled by comparison with those of such great road races as the Vanderbilt, the Savannah, the Briarcliff, and the Lowell. The building of the Long Island motorway is a great step toward furnishing this form of test; in fact, the Long Island cement stretch has actually solved the problem of a safe and lawful speed arena.

While interest was naturally greatest among the general public in the contention of the cars of the highest price and power, the struggles of those of lesser value were closely followed by those who looked to the series of sweepstakes to furnish evidence of the relative speed and road qualities of the various models and price classes; in a word, by the members of the automobile cult whose choice and purchase are affected by such car demonstrations. And their friends buy likewise.

The big race of the day, of course, was the Motor Parkway Sweepstakes, whose finish came after the contenders in the other five sweepstakes had run their course, gathered their respective laurels, and earned their thousand dollar prizes. It had added interest from the fact that its list embraced several prominent Vanderbilt Cup cars and drivers. There were Herbert Lytle, a well-known Vanderbilt Pope-Toledo driver and who also successfully piloted an Apperson at Savannah, at the wheel of Clifford V. Brokaw's Isotta; Louis Strang, probably well entitled to be called the American road champion, who has just been retained permanently by Paul LaCroix, in the Renault; Charles Basle in the Knox, which finished second in the Lowell race; F. Lescault with the Simplex that captured the last Brighton Beach 24-hour race, and Willie Haupt and the Chadwick he had driven so successfully in the present season's hill climbs.

Strang's Renault Flying Past Grandstand.

Strang, through his victories with the Isotta in the Savannah, Briarcliff, and Lowell contests, and Robertson, by his win of the Brighton Beach 24-hour race and his more recent triumph at Philadelphia, have earned the premiership among our drivers in critical and public estimation. The outcome of the Motor Parkway Sweepstakes easily places Lytle on a par with these two, and assures America of a trio instead of a duo of drivers in the international races at hand that bid fair to give as good an account of themselves against the foreign cracks as did Joe Tracy with the Locomobile in the last Vanderbilt race.

Under Lytle's brilliant pilotage the Isotta added the Motor Parkway Sweepstakes to its Savannah-Briarcliff-Lowell honors, and, incidentally, annexed a new American long-distance road record as well. It covered the ten laps of the 23.46-mile course, 234.6 miles, in 3 hours 39 minutes 10 seconds. It averaged 64.25 miles an hour, as compared with the best previous American average of 61.43 miles, scored by Wagner when he won the 1906 Vanderbilt Cup race with the Darracq.

Strang made a game chase with the Renault, tying the Isotta the first lap, but from that point on being gradually and very slowly outfooted, finishing 11 minutes 15 seconds behind the Italian car. Strang had made the run in 3 hours 50 minutes 25 seconds and scored an average of 61.20 miles per hour, which was but a shade under Wagner's former record. The Itala was third, the Simplex fourth, and the Chadwick fifth. The Knox and Hotchkiss completed but six and five laps, respectively.

The Meadow Brook Sweepstakes at 211.14 miles, for cars from $3,001 to $4,000, fell to the Allen-Kingston, driven by H. Hughes, a car that has made heretofore most of its reputation in short and long-distance track events. It made the run averaging 52.6 miles per hour. Mrs. Joan Newton Cuneo's Rainier, of Glidden tour fame, piloted by L. A. Dis-

brow, ran a creditable second at an average of 52.2 miles per hour. The Lancia, driven by W. M. Hilliard, third, averaged 47.9 miles. This car possessed the smallest cylinders, 3 1-2 bore by 3 7-8 stroke, of any car in the race, except the Nassau little fellows. It made the 211.14-mile run on 13 gallons of gasoline, an excellent showing.

Another newcomer to the metropolis, a Sharp-Arrow, so new and so insignificant from the point of production, being the creation of a Trenton, N. J., enthusiast, as to be looked upon as a free lance. W. H. Sharp, who drove it, walked away with the Garden City Sweepstakes at 187.68 miles, with an average of 56.4 miles an hour. As a matter of fact, this average was beaten by only two cars in the entire sweepstakes, the Isotta and the Renault. The Sharp-Arrow is an assembled car with a Continental engine. There was talk after the race of a protest of the car on the ground that there had not been a sufficient product to comply with the stock car rules requirements. It was claimed at its supply pit, however, that 40 of the cars had been produced. William Bourque's Knox, which is entered for the Vanderbilt Cup, finished second, with an average of 45.2 miles an hour.

Chalmers-Detroit Overhauling Buick.

The two Chalmers-Detroit candidates for the Jericho Sweepstakes, for cars from $1,001 to $2,000, made a most successful and impressive racing debut. They ran first and second, and were driven, respectively, by W. H. Burns and J. D. Ainslie. The winner covered the 140.76 miles at an average of 48.65 miles per hour. The average of the second to finish was 46.1. Their nearest pursuers were a pair of Mitchells.

Among the little fellows in the Nassau Sweepstakes, for cars of $1,000 and under, the Buick had it pretty much all its own way, making the 93.84 miles run with an average of 44.1 miles per hour.

The contest of the tires was also closely watched. It was Michelin's day, for Michelins were on the Isotta and Renault, the first and second in the big race, and on the winning Allen-Kingston, Sharp-Arrow, and Buick. Diamonds scored first and second in the Jericho with the Chalmers-Detroit pair.

The race was remarkably free from accidents of all kinds, either to men or machines, considering the large number of starters. In fact, but one participant was injured. In rounding a curve a Stoddard-Dayton, driven by A. C. Miller, threw off its mechanic, William La Motte, breaking his arm. Another Stoddard-Dayton, with K. Wright at the wheel, was ditched and put out of the race in the first lap. A Palmer & Singer, piloted by Ray Howard, was put out of the race by running into a fence, but neither of its crew was injured. The Chalmers-Detroit "40," which L. B. Lorimer drove, ran into a dog and broke its radiator. The latter leaked so badly that the car discontinued the contest. Two instances were reported of spectators being hit by flying pieces of metal or wood as the cars rounded the turns.

The management of the race by the A. A. A. and Motor Parkway officials was excellent, William K. Vanderbilt, Jr., acting as referee. The protection of the spectators was efficient. There was a large corps of Pinkerton men along the homestretch in the neighborhood of the grandstand. At other points of the route were stationed deputies, a large number in the aggregate. The Parkway cement stretch was well protected by a high wire fence, though this stretch runs for most of the way through the barren Hempstead plain and really was too isolated to be in danger of congested crowds, anyhow. Flagmen encorded the entire course to signal the drivers.

At the start and finish the Motor Parkway Company had erected a monster permanent stand seating 5,000 people and opposite thereto a two-story structure for officials and newspaper men. At the front of the grandstand were several rows of commodious boxes, behind which seats rose in tiers to the great roof, in itself an innovation for racing stands. The front of the stand and boxes was hung with purple cloth; festoons of the shields and flags of all automobile racing nations surmounted the pillars; and above the roof floated great American flags.

The official and press stand was most complete in its equipment. Above were score boards for each sweepstakes. The main floor was given over to long tables for the newspaper men. Behind them were booths for the telegraph operators and 15 telephones. The officials had a compartment to themselves at the tape end, and in the corner was a most hospitable bar. In the second story were Charles J. Dieges and S. M. Butler and other members of the New York Timers' Club, who looked after the clocking; the scorers' tables, and more benches and desks for newspaper men. There was an abundance of room for pressmen.

The most novel and interesting part of the homestretch equip-

The Chalmers-Detroit Winner Which Easily Won Its Class, with Another of Its Kind in Second Place.

A Maxwell-Briscoe Quartette

Chairman Thomson and Vice President Speare

Robert Graves

Cup Doner Vanderbilt joins the Union

Pardington the Indefatigable

Metzger of Detroit and Lewis of Racine with Roche acting as Centre

A Special Observation Train

Behind the Parkway Bars

ment, however, was the row of supply pits that stretched in front of the grandstand for its entire length. There was space enough between the pits and the track for racing cars to stop for their supplies. Mountains of tires were dumped into the pits in the aggregate, to say nothing of the rivers of gasoline and oil. It was highly interesting to watch the crews take on their supplies and make their adjustments. There were at times repairs made that were of hitherto unaccustomed frankness. It is safe to say, however, that when possible the more serious work was reserved for the other official supply station on the backstretch. So far as the grandstand pits showed, however, there seemed remarkably little repairing and adjusting to be done.

There Was Not Much Tire Trouble.

In front of the grandstand stretched the long broad ribbon of white cement, plain to the view for a mile in either direction. To the west it approached over a hill that bridged an intersecting highway and disappeared to the east beneath a bridge that furnished a crossing for another road. The surface of the cement was roughened to prevent skidding, and at the turns the path was well banked. There had been fears that the rough surface would prove hard on tires. This turned out not to be so. On the contrary, there was less tire trouble reported than at any former road race. In fact, Peter Prunty's once familiar announcement, "Stopped by tire troubles," was heard only occasionally.

So smoothly and swiftly did the racing cars speed over the level surface of the parkway stretch that some pilots were forced into the belief that their machines were not making as rapid progress as they did over the smooth country roads that made up two-thirds of the circuit. In fact, "Herb" Lytle stoutly maintained that the Isotta traveled ten miles an hour faster over the backstretch than it did over the parkway. The truth is the monotony of speeding over a uniform surface and the absence of any resistance or necessity for swerving to pick a path deceived the pilots. One has heard the novice drivers over Ormond Beach complain that they were disappointed in the speed the beach gave. The watch soon undeceived them, just as it undoubtedly would were the time taken over the parkway stretch. It would, by the way, be most interesting at the Vanderbilt Cup race could there be devised some way of getting and announcing the times the cars made from the beginning to the end of the parkway stretch, or from its start to the grandstand.

The start for the race from town began before daylight for the general public. The Long Island Railroad had arranged for a big and frequent train service. The first was advertised to leave at 5 o'clock. It was fully half an hour late in starting and was made up of seven cars only fairly well filled. The early racegoers were dumped out on a siding behind the stand with a quarter of a mile walk across the meadows ahead of them. When they reached the stand only A. R. Pardington and a few employees and Pinkertons were on the ground. Soon, however, automobiles began to arrive, coming down the course from the toll gates, and took their stations on the broad borders on either side of the path. The distant bridge soon filled with cars, whose owners had framed up this fine viewpoint. Before the race began there were perhaps a hundred cars between the grandstand and the bridge. The grandstand was slow in filling. To tell the truth, it did not nearly fill. There were spectators in perhaps half the boxes and a thousand or so in the seats. The crowd was swallowed up by the monster stand. Along the country highway section of the course there were thousands of people and hundreds of cars in the aggregate. That the grandstand was isolated in an unknown district, that big fees were charged for seats and parking spaces, that the viewpoints elsewhere on the course were free, and that the sweepstakes being merely a curtain raiser to the near-at-hand Vanderbilt race suffered by comparison so greatly as to injure the attendance, were among the guesses given for the patronage of the center point of the struggle being so unexpectedly small. Some thought that the splitting of the race into sub-divisions, while novel and interesting from a trade standpoint, lacked the concentrated attraction of a single contest, from which a single individual winner was to be evolved.

Parkway Curves Are so Scientifically Constructed that the Cars Had no Difficulty Whatever in Sustaining the Highest Speed.

At 8 o'clock, an hour before the time set for the start, Fred J. Wagner, the official starter, arrived and set to work to get the racers into line. It was an easy task for this experienced hustler to line them up in a double row, with even numbers on one side and the odd on the other, the various classes or sweepstakes following one another in the order set for their start.

Just before this Referee Vanderbilt had driven up in a big touring car with three friends. He wore a long overcoat instead of the usual natty "knickers" and Norfolk jacket. It was an overcoated and fur-wrapped crowd. A chilling wind blew stiffly from the north and officials and spectators promenaded briskly to keep warm. The shivering newspaper men found writing hard with benumbed fingers. The drivers had a cold ride ahead of them.

Many Prominent in Sport and Industry.

In the throng along the homestretch were many men prominent in the sport and industry. With so many makes of cars represented, their backers alone made quite a noteworthy array of trade leaders. There were conspicuous evidences of a truce in the racing war, if not an end to it altogether. A. A. A. and A. C. A. officials were both on hand and commingling in apparent fraternity. The rival chairmen, Thompson and Morrell, chatted cordially together, and Secretary Butler busied himself with preparations for the timing and scoring with as much hustle as though the scene was Savannah and the Grand Prize was about to be started.

Sharp at 9 o'clock "Wag," with Charley Dieges and "Sam" Butler at his side, the former holding a big ship chronometer and the latter with notebook in hand, sent away the first of the little fellows, a Mitchell, a candidate for the Nassau "thousand." The other Nassauvians were started at half minute intervals. The first of the Jericho outfit was started at 9:05, the Garden City at 9:10, the Meadow Brook at 9:15, and the Parkway at 9:20, the cars in each leaving at the same half minute intervals. But four of the 37 entrants failed to face the starter. They were the Garford, Pennsylvania, Cleveland, and Moon cars.

And When the Races Were On.

The first car to complete a lap was the Buick. It had gotten by the Gyroscope and Mitchell, and made the 23.46-mile round in 30:55. A string of cars followed at short intervals and so fast that the announcer and the tally sheet-keepers in the press box were soon lost in the shuffle. There was confusion for a few minutes, and then "Hank" Caldwell, A. B. Tucker, and others came to the rescue with score slips which they read aloud. Even after that it meant lively hustling for the scribes to keep tally of the race, so fast and frequent was the passing of the cars. Even in the first two laps cars overtook and passed cars of the sweepstakes starting ahead of them. The best battles of all the classes were those of the little fellows in the Nassau and the big 'uns in the Parkway.

In the early stages of the race the duel between the Isotta and the Renault was intensely exciting. Lytle and Strang were tied to a second the first round, but the next lap the former Pope pilot gained some three minutes on the three-cup winner, Strang. The Italian car, as a matter of fact, pulled away from the French machine at an average rate of a minute a lap, though Strang reduced Lytle's lead to four minutes in the seventh round. The Knox gave Lytle and Strang a close run for the leadership in the first round, but after that dropped back into the ruck. The Itala got into third place in the fourth round and was never dislodged therefrom to the finish. The Hotchkiss was never dangerous after the third lap. The Chadwick put up a good fight for third place for six rounds, but after that was passed by the Simplex.

Though the Allen-Kingston led all the way in the Meadow Brook, the Rainier, a newcomer in the racing field, gave it a pretty good rub from start to finish, being beaten out by less than three minutes. The little Lancia did wonderfully fast work, considering its small cylinders. Hilliard negotiated laps in the "28's" practically the entire way, but this was not quite fast enough to win in company so much higher powered.

The Sharp-Arrow had things practically all its own [illegible] two laps in the Garden City, and well it might, for it proved itself second in speed only to the Isotta and Renault. Its runaway, however, did not come until the third lap, for Burman (Buick), Lorimer (Chalmers-Detroit), and Howard (Palmer & Singer) all led it to the first lap. In fact, Howard led his field for two laps until the Palmer & Singer met with its accident and had to quit, its time having been 23:42 for the first and 46:29 for the second lap, as against 24:48 and 49:19 for the Sharp-Arrow. Much had been expected of the P. & S. car, and its disappearance was a source of disappointment to many. The Chalmers-Detroit pair had the Jericho practically all to themselves, the only car to dispute their leadership and continue the race to the end being a Mitchell, driven by Frank Zirbies.

The Nassau was the merriest of merry scrambles, from which Hugh Easter and his Buick emerged a leader at every lap of the biggest field of the whole race, thus atoning largely for the disappointment Mr. Durant had experienced in Robert Burman's failure to win the Garden City.

This Part of the Parkway Resembles a Huge Circular Track, but the Curve Is so Gradual that Top Notch Speed Was Possible.

TECHNICAL SIDE OF THE FIRST TRYOUT OF 1909 CARS

By CHARLES B. HAYWARD.

ALTHOUGH it was scheduled as a race, and presented to the public as an event of this character, last Saturday's canter round the Long Island course, preliminary to the holding of the Vanderbilt Cup race on the 24th, was in reality a competitive tryout of new models where a number of the entrants were concerned—the first on the slate for the new cars of next season, as well as the first of its kind ever held in this country. American manufacturers maintain a high standard where what is known as the "trying-out" process is concerned, and, before receiving the final seal of approval, a model is usually run a year or more on experimental work, while each replica of the standard thus evolved is given a thorough running-in by the factory tester before it goes to the body shop and thence to its new owner.

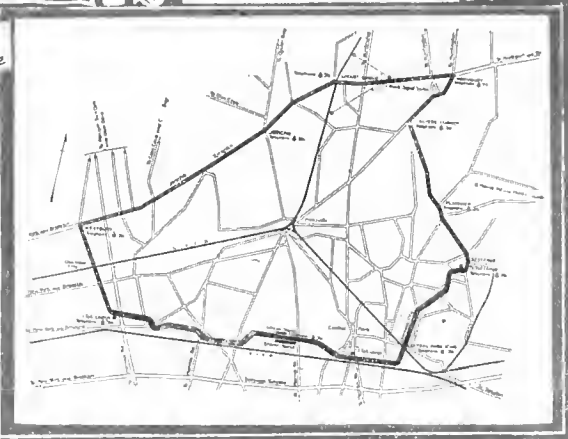
But what makers have been hankering after has been an opportunity of trying-out their new productions each year in competition with the cars of other makers. This, the Swecpstakes events, held on the Long Island Motor Parkway and adjacent roads last Saturday, provided in hitherto unprecedented manner. True, there were some that were not new models, mostly in the foreign entries, but the majority came under this head, and the performance of the various entrants gave prospective purchasers an excellent opportunity of judging of the merits of the new productions of quite a number of makers.

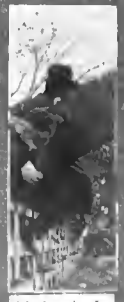
It was essentially a battle of four-cylinder cars, as with the single exception of the Chadwick, piloted by Willie Haupt, who fought for top-line honors in the Motor Parkway sweepstakes, there was not another six-cylinder car to score, and, as a matter of fact, but one other was entered. At the other end of the line,

No. 1, Mitchell - First Off

Mechanic La Motte - the Injured

Map of The Course



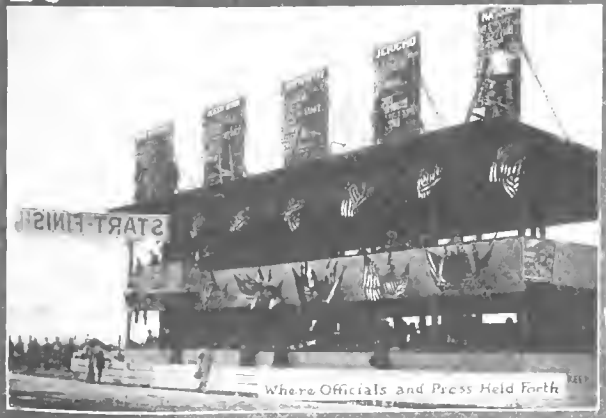


Railbirds

The Ambulance

Into the Jericho Turnpike

Flagmen at Rest



Where Officials and Press Held Forth

Michelins in Their Pit Matlack in Charge

Lancia, Pilot Hilliard, and Director Tangeman.

in the Nassau sweepstakes class, there were a couple of exceptions to the four-cylinder rule in the shape of the twin-cylinder Reo and the lone representative of the one-lunger class, the little Cadillac. Otherwise, it was largely a case of piston displacement on the basis of four cylinders, as apart from the higher-powered cars in the star event of the day, which were almost equally divided between chain and shaft-driven types, the great majority of the entrants formed a more or less close approach to a standard of construction in the shape of a shaft-driven car that is now very general.

If the results of a race could be predicated solely upon the efficiency of the motor and the various essentials of its transmission in delivering the power to the driving wheels as a basis, it would be easy to mechanically classify the contenders according to their order of finishing, barring mishaps that could not well be taken into account in such a summing up. But it has been shown time and again that not only generalship in driving, but also that final tuning up, which can only be done properly by the skilled hand, is of paramount importance, while the element of luck holds every driver's destiny more or less in hand from start to finish, so that the best efforts of the designer and maker are not always rewarded to the fullest extent.

Isotta.—This car has been a top-liner so often during the racing season of the present year that its principal features have become very well known, as the contender on the Parkway last Saturday was a duplicate of the machine that Strang has piloted to victory on three other occasions this year. It is nominally rated at 60-horsepower, but is naturally capable of an output considerably in excess of this, particularly as its motor can be run at a very high speed without a falling off in its power, owing to the unusually large size of its valves.

Stoddard-Dayton in the Grandstand Stretch.

Sharp-Arrow.—Except insofar as its mechanical details could be judged from an exterior view, this car was as much the dark horse of its class technically considered as it was from every other point of view, as it was an eleventh-hour entrant about which little was known at first and its successful performance only served to deepen the mystery. It came out later that it was equipped with a Continental motor, and in all probability its other essentials came from equally well-known parts makers, so that as an assumption of what its mechanical details may be, a four-cylinder motor of 40-50 horsepower, some standard type of clutch, a four-speed selectively operated gear-set with final drive by shaft, many of these details naturally being self-evident, will doubtless not be far wrong. Its designer was at the wheel.

Allen-Kingston.—The "A-K" is a car that has given evidences of its capacity for speed and endurance on racing occasions during the past year. It has a four-cylinder motor measuring 5 by 5 3-4 inches and is rated at 40-45 horsepower, a Bosch high-tension magneto supplying the ignition, while a pump and circulating system takes care of the oiling, and a Breese carbureter completes the essential accessories.

Chalmers-Detroit.—Owing to the numerous features in which this little 24-horsepower car differed from its competitors in its class, its performance was looked forward to with a great deal of interest and much was expected of it. Its four-cylinder motor is cast *en bloc* with both the intake and exhaust passages integral, while the circulation of the cooling water is on the thermo-syphon principle. Dual ignition is provided, consisting of a Bosch high-tension magneto and a standard set of unit coils and timer fed by a storage battery. The clutch is of the multiple-disc type and the sliding gear-set, acting selectively, provides three forward speeds, the motor, clutch and gear-set all being combined so as to form an extremely compact and light power-plant. Lubrication is effected by means of an extremely simple and reliable circulating system employing a gear-driven pump, while the carbureter is the same type as is used on the Chalmers-Detroit Forty.

Buick.—This little 18-horsepower car proved considerable of a surprise to those who were trying to figure the chances of the entrants in the small car class, particularly as the use of a two-speed planetary gear is not considered the best possible equipment for racing purposes. This car's four-cylinder motor measures 3 3-4 inches "square," while its most important accessories consist of a Bosch high-tension magneto, a Hill Precision lubricator, and a Kingston carbureter.

Some Creditable "Also Ran" Performances.

While the puhlic usually concerns itself with the winners alone, the observer who keeps his eyes open during the course of a race, and particularly at the finish, can often find more cause for congratulation in the performance of the cars that missed getting all the glory in their classes than those that shone forth most brightly in the lime-light of the tape. In the first two classes, the Renault and the Knox stand out strongly, while in the Meadowbrook sweepstakes, the work of the small Lancia was positively eye-opening.

For instance, the Renault was the standard 35-45 horsepower put out by this firm and the fact that its average for the distance was but three miles less than its much higher-powered rival hardly calls for any comment. In the case of the Knox, it was more difficult to judge of what Bourque had to run against as no one solved the mystery of the Sharp-Arrow.

Doubtless the most phenomenal performance put up by any of the cars, considering its horsepower ahility as compared with others in its class, was that of the Lancia, which with its 3.5 by 3.9-inch eylinders was pitted against cars nominally rated at 50 horsepower and concededly capable of a great deal better, so that its average of hetter than 47 miles an hour for the entire distance is not alone remarkable, but shows what a very close approach it made to the performance of cars of double its size. The absolute uniformity with which the laps were reeled off is also noteworthy, as its time differed but a few minutes at the most, and was frequently only seconds apart for the various laps.

RACE GOSSIP GATHERED FROM VARIOUS SOURCES

Auto Notables on Hand.—Noteworthy among the trade leaders at the trackside were: H. B. Joy and M. J. Budlong, of the Packard Motor Car Company; E. T. Birdsall, of the Selden Motor Vehicle Company; C. H. Tangeman and Harry Fosdick, of the Hol-Tan Company; C. A. Singer, of the Palmer & Singer Manufacturing Company; R. M. Owen, sales agent for the Reo and Premier; C. M. Hamilton, of the Isotta Import Company; Paul LaCroix, of the Renault American agency; John Matlack, of the Michelin Tire Company; W. M. Lewis and C. P. Skinner, of the Mitchell Motor Car Company; Alfred Reeves, of the American Motor Car Manufacturers' Association; A. R. Whitney and Ralph Newton, of the Stoddard-Dayton agency; Carl H. Page, of the Chalmers-Detroit and Peerless agencies; Hugh Chalmers, R. D. Chapin, and H. E. Coffin, of the Chalmers-Detroit Motor Company; W. E. Metzger, of the Everitt-Metzger-Flanders Company; E. Lillie, of the Itala Import Company; E. H. Broadwell, of the Fisk Rubber Company; John T. Rainier, of the Rainier Motor Car Company; C. G. Stoddard, of the Dayton Motor Car Company; S. A. Miles, of the N. A. A. M.; E. P. Chalfant and C. F. Clarkson, of the A. L. A. M.; W. F. Wright and C. R. Culver, of the Knox Automobile Company; A. G. Southworth, of the Buick agency; Herbert Githens, of the G. & J. Tire Company, and Charles Meyers, of the Diamond Rubber Company; L. R. Speare, S. L. Haynes, J. P. Coghlin, W. H. Chase, Paul Wolff, Secretary F. H. Elliott, and other A. A. A. directors.

Converted to Racing.—Hugh Chalmers, Roy D. Chapin, and Percy Owen were conspicuous at the Chalmers-Detroit pit. The rôle of backers of the racing game was a bit new to Messrs. Chalmers and Chapin, though Mr. Owen is a veteran of the early days and a former Gordon-Bennett pilot. The double success of the Chalmers-Detroit on its debut in speed competition also made enthusiastic converts of the Detroit members of the trio. In future they may be found flying higher.

Want a Night of It.—One of the reasons advanced for the small attendance of the general public at the race, as compared with that of previous Nassau County contests, was that being started at 9 o'clock it did not appeal to the sporty crowd, which liked an excuse to make a night of it, nor to those seeking the novel adventure of midnight race going. It was argued that thousands of people would travel by night to see a race that started at daylight, who would not get up at daylight to get to a race that started at 9 o'clock.

"Darn That Band."—Music had no charms for the scribes who were striving to catch the times from Peter Prunty's megaphone and "Hank" Caldwell's mouth organ. The newspaper fraternity is unanimous in its demand that the band be moved across the course to the grandstand from its present location alongside the press box. They say, by the way, that by Vanderbilt race time there will be score boards in front of the press stand to stop newspaperdom's frantic howls for "Time."

Physicians on Hand.—Dr. Louis N. Lanehart, of the Nassau Hospital, was at the grandstand with a corps of surgeons and trained nurses prepared for any emergency. A White steam ambulance was also in readiness for a quick run to the hospital at Mineola, should there be an accident.

To the Vanderbilt by Electricity.—By the time of the Vanderbilt race the Long Island Railroad will have completed its line of electric poles to the siding at the rear of the grandstand. This electrification of the service will vastly quicken it.

Evidence of Peace.—Former A. C. A. Presidents Colgate Hoyt, and Winthrop E. Scarritt, Chairman Robert Lee Morrell, and Secretary S. M. Butler were in evidence at the starting point. Mr. Butler superintended the timing and scoring.

"Suppose It Rains?"—"Suppose it should rain on Vanderbilt Cup day what would happen those poor devils in the supply pits?" asked one of the inveterate trouble-seekers.

A Smooth-Faced Referee.—The photographers had an excuse to snap the much-pictured referee repeatedly, for since the last race Mr. Vanderbilt has shaved his mustache.

Garden City Hotel Crowded.—Though there was not the hurrah at the Garden City Hotel that is incident to the night before a Vanderbilt race, there was enough of a crowd on hand to force the management to put several beds in rooms.

Little Fellows Slowed Big 'Uns.—The drivers of the big cars all agree that the obstruction of the small cars on the course made a big difference in the time, owing to their slowing down constantly through fear of collision. Lytle is sure that the Vanderbilt will show at least five miles an hour better.

Fosdick Averts Danger.—Some one undertook to water the stretch in front of the supply pits, several mechanics having complained of the dust. Harry Fosdick, however, protested, since the mixture of oil drippings and water endangered some car skidding into the pits. A spectator's clothes, by the way, were ruined through a wheel spinning and throwing the greasy muck on him.

Chadwick, Haupt Driving, Ascending the "Hill."

Congressman Chases Fakirs.—One of the biggest outlying crowds was gathered at the junction of the Jericho turnpike and the old Westbury road. Some light-fingered gentry set up some roulette wheels there. It happens that the crossroads at this point adjoins the estate owned by Congressman William W. Cocks, of automobile law fame. Mr. Cocks landed suddenly on the scene and without ado kicked over the table and put the gamblers to flight. One of them attempted to again set up his wheel in an adjoining field. By this time the congressman had his fighting blood up and the rural croupier did not dare even to look back until he had put a mile of road behind him. Some three-card monte men, by the way, tried to work the first race train out of Long Island City, but they found the early bird mechanics and newspaper men too "wise guys" to fall for their game and they only got the laugh along the aisles of the cars when they tried to catch a victim.

Sharp-Arrow, One of the Parkway Surprises.

Railbirds on Bridge Enjoying the Racing.

TABULAR STORY OF THE SWEEPSTAKES WITH WHICH LONG ISLAND MOTOR PARKWAY WAS OPENED.

MOTOR PARKWAY SWEEPSTAKES, 234.6 MILES—For Cars Selling Over $4,000.

No.	CAR	Driver	1	2	3	4	5	6	7	8	9	10	Total	Fastest Lap	Avg. Lap	Average Miles per Hr.
P42	ISOTTA	Herbert Lytle	22.17	43.42	65.06	86.25	107.49	129.00	154.09	176.09	197.30	219.10	3:39:10	21:11	21:55	64.23
P46	RENAULT	Lewis Strang	22.17	46.26	69.34	92.35	115.29	138.10	160.37	183.15	205.48	230.25	3:50:25	22:27	23:03	61.20
P47	ITALA	G. Lechleiter	25.56	51.23	76.30	101.10	126.11	153.02	178.21	203.23	228.15	253.09	4:13:09	24:40	25:19	55.6
P43	SIMPLEX	F. Lescault	34.30	58.27	81.22	111.22	135.02	158.20	181.45	205.12	228.57	256.21	4:16:21	22:51	25:38	55.0
P41	CHADWICK	W. Haupt	26.13	50.35	75.43	103.16	127.51	154.32	192.49	220.24	244.03	267.57	4:27:57	23:39	26:48	52.7
P45	KNOX	Charles Basle	22.46	71.01	137.03	173.30	214.23	252.36	.....	.....	.....	.....	.....	22:46	.....	....
P44	HOTCHKISS	J. Kilpatrick	23.46	47.19	70.55	93.58	116.43	.....	.....	.....	.....	.....	.....	22:45	.....	....

MEADOW BROOK SWEEPSTAKES, 211.14 MILES—For Cars Selling from $3,001 to $4,000.

No.	CAR	Driver	1	2	3	4	5	6	7	8	9	Total	Fastest Lap	Avg. Lap	Avg. Miles per Hr.
M35	ALLEN-KINGSTON	H. Hughes	25.33	54.30	79.11	103.19	127.17	164.15	188.42	214.23	240.47	4:00:47	23:58	26:45	52.6
M32	RAINIER	L. A. Disbrow	27.44	55.27	83.16	110.16	137.20	164.13	190.54	217.32	243.42	4:03:42	26:19	27:05	52.2
M34	LANCIA	W. M. Hilliard	29.42	58.35	86.45	114.52	149.09	177.48	206.05	235.08	264.15	4:24:15	28:07	20:24	.....
M36	RAINIER	Axel Peterson	28.14	75.14	104.09	130.12	156.14	182.14	208.02	233.24	.....	.....	25:22	.....	47.9

GARDEN CITY SWEEPSTAKES, 187.68 MILES—For Cars Selling from $2,001 to $3,000.

No.	CAR	Driver	1	2	3	4	5	6	7	8	Total	Fastest Lap	Av. Lap	Avg. Miles per Hr.
G28	SHARP ARROW	W. H. Sharp	24.48	49.19	73.45	97.56	121.59	150.05	174.47	199.34	3:19:34	24:03	24:57	56.4
G27	KNOX	W. Bourgue	39.03	87.13	115.11	142.30	168.09	197.46	222.32	249.11	4:09:11	25:06	31:09	45.2
G21	STODDARD-DAYTON	A. R. Miller	38.39	58.06	84.25	109.37	162.22	188.59	214.54	251.52	4:11:52	24:27	31:29	44.8
G26	BUICK	R. Burman	23.40	53.29	81.45	106.41	130.48	154.09	191.01	.....	.....	23:21	.....	....
G25	STODDARD-DAYTON	H. Tuttle	29.07	67.19	93.33	120.02	147.53	193.04	.....	.....	.....	26:14	.....	....
G22	CHALMERS	L. B. Lorimer	24.38	62.13	104.34	130.21	.....	.....	.....	.....	.....	24:38	.....	....
G24	PALMER-SINGER	Ray Howard	23.22	46.29	.....	.....	.....	.....	.....	.....	.....	23:22	.....	.....

JERICHO SWEEPSTAKES, 140.76 MILES—For Cars Selling from $1,001 to $2,000.

No.	CAR	Driver	1	2	3	4	5	6	Total	Fastest Lap	Avg. Lap	Avg. Miles per Hour
J11	CHALMERS	W. R. Burns	29.10	.....	.....	.....	.....	.....	.....	27:57	30:26	48.65
J16	CHALMERS	G. J. Ainslie	39.26	57.07	87.41	119.08	150.31	182.36	3:02:36	24:57	32:03	46.1
J18	MITCHELL	F. Zirbes	49.01	64.23	96.28	128.52	161.25	192.00	3:12:00	32:18	37:46	39.2
J13	MAXWELL	Charles See	50.54	87.45	123.55	156.13	189.04	226.07	3:46:07	28:24	.....	.....
J15	SELDEN	Charles Young	29.42	180.54	109.18	.....	.....	.....	.....	29:42	.....	.....
J12	MITCHELL	C. A. Kerchoff	53.57	03.14	.....	.....	.....	.....	.....	53:57	.....	.....

NASSAU SWEEPSTAKES, 93.84 MILES—For Cars Selling for $1,000 and Under.

No.	CAR	Driver	1	2	3	4	Total	Fastest Lap	Avg. Lap	Avg. Miles per Hour
N3	BUICK	Hugh Easter	30.55	67.10	97.23	127.52	2:07:52	30:55	31:58	44.1
N4	CAMERON	F. P. Cameron	33.54	67.59	101.54	135.52	2:15:52	33:54	33:58	41.7
N1	MITCHELL	W. Olney	32.28	71.04	108.12	142.23	2:22:23	32:28	35:36	39.6
N5	MITCHELL	H. R. Cousins	33.04	68.05	113.42	150.02	2:30:02	33:04	37:30	37.6
N7	BUICK	L. H. Titus	43.32	79.43	119.09	150.04	2:30:04	30:55	37:31	37.5
N6	CADILLAC	F. W. Darnstadt	44.02	94.13	135.06	194.13	3:14:13	40:53	48:33	49.2
N8	REO	A. F. Camacho	36.29	72.41	108.30	.....	.....	35:53	.....	.....
N2	GYROSCOPE	C. White	99.53	105.05	.....	.....	.....	49:53	.....	.....

The Air-cooled Cameron Starting on Its Journey.

Here's Where the Parkway Passes Under the Main Road.

Quakertown's 200 Mile Captured by a Locomobile - Robertson driving

PHILADELPHIA, Oct. 10.—Amid the plaudits of as many of the more than four hundred thousand spectators as could get within eyeshot of the finish, George Robertson to-day drove his Locomobile "40" across the line a winner of first honors in the Founders' Week 200-mile stock chassis road race. Cyrus Patchke with a 45-50 Acme finished second, over twelve minutes behind. Ralph Mulford, 50-horsepower Lozier, was third, and Bert Maucher, a local driver, came in fourth with his 38-horsepower Peerless. The course was 7.8 miles long, and 25 circuits were made—195 miles.

The sixteen contestants were all lined up awaiting the road for fully a half-hour, and the first car was started just as the factory whistles in the nearby city sounded the signal for beginning the new day's toil at 7 o'clock. They were sent on their 195-mile journey at half-minute intervals in the following order:

Car.	Cyls.	H.P.	Driver.	Tires.
1. Maxwell	4	28	H. Bittner	Ajax
2. Apperson Jack Rabbit	4	48.4	George Davis	Diamond
3. Peerless	4	38	Bert Maucher	Diamond
4. Pullman	4	40	Max La Roche	Diamond
5. Thomas*	6	70	George Salzman	.....
6. Studebsker	4	38.5	Frank Yerger	Diamond
7. Chadwick	6	50	Jack Harkins	Diamond
8. Stoddard-Dayton	4	34.5	E. C. Ireland	Contin'ti
9. Locomobile	4	40	J. W. Florida	Firestone
10. Locomobile	4	40	George Robertson	Firestone
11. American Locomotive	6	60.	L. J. Bergdoll	Fisk
12. Palmer & Singer	6	60	Wm. Wallace	Contin'ti
14. Acme	6	45-50	Cyrus Patchke	Diamond
15. Lozier	4	45	H. Michener	Contin'ti
16. Pennsylvania	4	38	Len Zengle	Diamond
17. Lozier	6	50	Ralph Mulford	Contin'ti

*Substituted for Welch 6-51, withdrawn.

The race was hard-fought from the start to near the finish. Just how close it was can be gathered from the fact that at the beginning of the 20th lap—148.2 miles—seven of the nine cars still in the race were separated by less than a lap. At that point Robertson's time on the leading Locomobile was 3:05.14. "Bill" Wallace, in the 60-horsepower Palmer & Singer, who occupied seventh position, was a little over eight minutes behind the Locomobile, for when he flashed past the tape the clocks registered 3:13:41. Just at this point a smash-up or persistent tire trouble could have sent any one of the others into the lead, but Robertson played safe, and by continuing to grind out 9:30 laps, according to the schedule, he finally wore down his opponents. Five cars covered the entire distance, although Florida's Locomobile was shut off from an official finish by the crowd. Frank Yerger's Studebaker was also running, five laps behind.

Robertson, who has many victories to his credit, can hardly appreciate any of them as highly as he did that of to-day. Not only was his win witnessed by a record-breaking crowd, but unless he has a particularly level head it was at least temporarily turned by the adulation of the hero-worshiping Quakers. Mayor Reyburn, who handed out the plunder after the race, metaphorically patted him on the back to the limit; Mrs. Reyburn insisted on poor, blushing "Robby" taking a bunch of American beauties, and when the crowd yelled "Speech!" the winner looked helplessly about, almost dropping the huge $2,000 Founders' Week cup that he hugged in his arms, and begged Glenn Ethridge, his mechanician, to "crank 'er up and let's get out of this." But the crowd was so dense that the winning Loco simply couldn't get through, and its team had to go through a course of hand-shaking such as would have made a presidential candidate's arm sore for a week.

It was a great day for Robertson and Ethridge and the Locomobile, not to mention the Firestone tires, which had carried the combination to a well-earned victory. The Acme, which finished second, was fitted with Diamond tires, as was the Peerless, which came in third. The Mulford Lozier, which finished in fourth place, carried Continental tires.

The fastest bit of work in the race was seen during the Lozier 50's tenth lap, when Mulford, in an effort to get up—he was five minutes behind the leader at the time—sent his car around the circuit in 8:32, creating a new record.

While the victory is the Locomobile's, it might not have been possible without Robertson. Over such a course, with no long straights, heady driving counts more than in a long circuit, with five and ten-mile straightways. On a long course the car's speed has a more direct relation to the result; on the Fairmount Park circuit intelligent driving is more than half the battle. There were speedier cars in the race than the Locomobile, but there were no headier drivers than Robertson. He nursed his tires on the turns; he took no chances on "grandstand" work. Those who, perhaps, were disappointed at his victory, said "Luck!". He made but one stop, it is true, but that was because he treated his car and his tires as tenderly as the conditions of a bruising race would permit. When, at the conclusion of the 15th lap, he considered it advisable to replenish his fuel, he passed the word to be ready with a complete set of tires when he came around on the next lap. All hands were ready, and the car had hardly come to a standstill before the Loco helpers were all over it like a colony of ants. In less than three minutes he was off. Organization helps.

Patchke, in the Acme 40-45, was compelled to make four stops —three for tire trouble (all on the road, away from the control) and one for fuel. These it was that helped keep him back. His car was fully as fast as the Loco, but his tire troubles, occurring, as they did, at points far removed from the Acme control, put all the work on him and his mechanician, Jere Price. Not a few valuable minutes were lost to the Acme-Patchke combination in consequence.

When interviewed after the race, Robertson was quite modest over his victory and was as ready to ascribe his success to good luck as were some of the disappointed ones. "We hadn't the semblance of an accident," he said, "and my car ran just like a well-taken-care-of watch. We stopped but once, and did everything needed to the car then, including the putting on a full set of Firestones. The tires we started with were not bad, but we had a little in bank, and played things safe. The course was not a fast one, and I early realized that any one who attempted to 'beat it' would come to grief. I figured it out that the Loco outfit could stand a 50-mile gait and win. I adhered to that schedule as nearly as I could."

Patchke, whose Acme finished second and won the MacDonald & Campbell cup, and who also captured a diamond ring for himself, said: "We lost our chance when our tires began to give way, as luck would have it, as far as possible from our control. Price and I had to 'get on the job' three times, and once you fall behind on that course, there is little chance of getting to the front, unless the leaders 'get theirs'. They didn't, and there you are." Asked to explain, he corroborated Robertson's statement that a speed in excess of 50 miles an hour meant trouble. The only stretch where sustained speed was possible, along the West River drive, was somewhat soft, the oil with which it had been liberally treated having filtered through the loose top dressing and leaving the surface mushy.

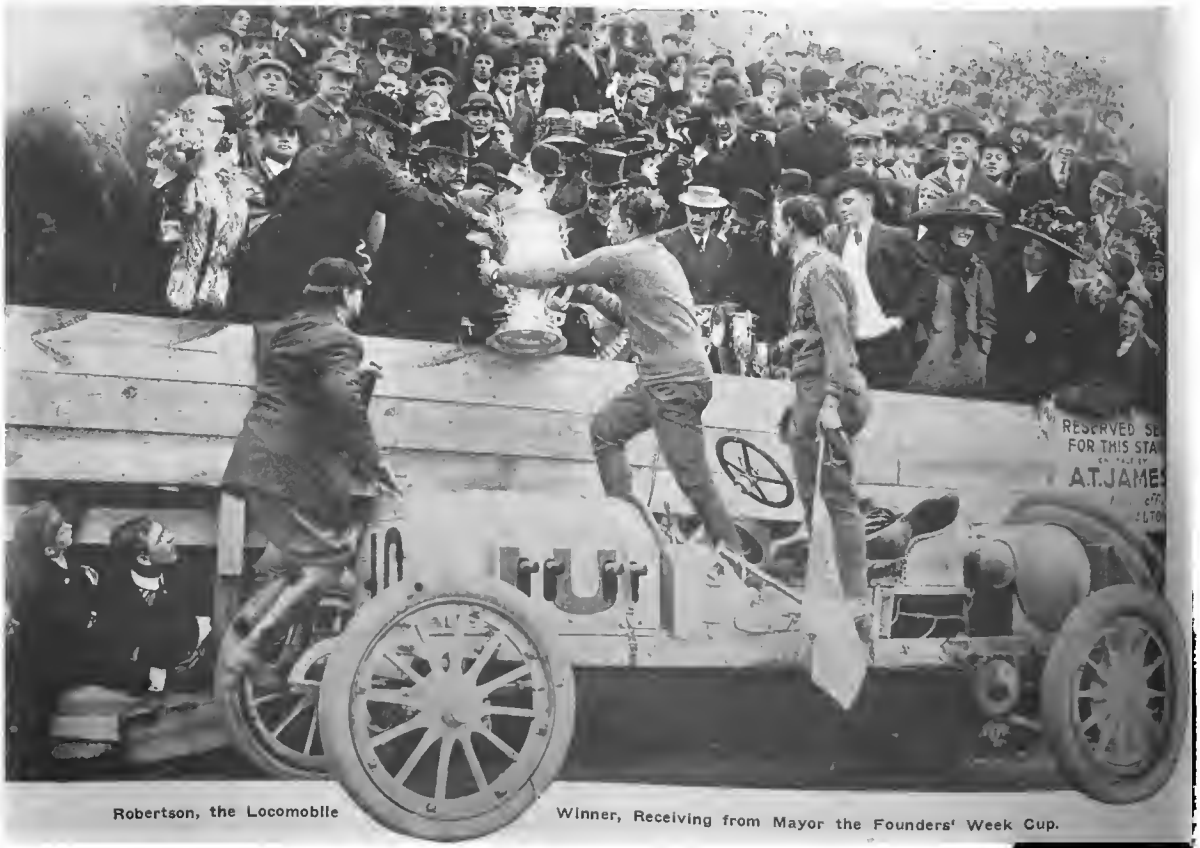
Ralph Mulford, driver of the Lozier "six," while somewhat disappointed over the result, said he might have won had the race been twice as long. "We were on the same lap with the leaders right up to the 20th round, when we lost six minutes with a bad tire. We showed what we could do on the tenth lap, when we made the fastest circuit of the day." And he showed the *North American* trophy which he had captured as the result of that fast bit of work.

Salzman won the *Record* cup for making the fastest time in the first lap with the Thomas—8:57. The *Press* trophy for the best average time and the *Evening Telegraph* cup for the most uniform time for the 25 laps have not yet been awarded.

It was a bleak morning, with a strong northeast wind chilling the marrow of the thousands of sport-loving Quakers who had left their warm couches to witness the novelty of a big road race right at their doors, as it were. All the trolley cars were put at work an hour earlier than usual to accommodate the huge crowds who flocked to the park. Many automobile parties went out to the course shortly after midnight in order to secure favorable positions to witness the race; not a few of them provided themselves with the materials for making coffee, and as dawn broke the scene suggested an immense army just waking to the day's activities—lacking the canvas and the instruments of warfare, of course. At the big camp on Belmont avenue, the handlers of the various cars and the tire men were up betimes, several of the racers taking slow trips over the course to finally size it up before the actual race should be on.

The spectators were gratified at the early announcement that the Thomas would start. The A. A. A. officials had limited the number of entries to sixteen, and there were several disappointed candidates when the limit was reached. Erwin R. Bergdoll, however, withdrew his Welch, and as the Thomas was first substitute, it was given the coveted place. It looked like a winner for six laps and then went to the discard with a broken crankshaft.

The management of the whole affair from the beginning was excellent. The mayor was in his place in the official grandstand for five long hours, and under his eye Superintendent of Police Taylor had his men on their mettle. Only one criticism was heard, and that was as to the rather primitive score-board provided. This was built over the press stand, and apparently for the sole benefit of the grandstand occupants. If the press men wanted to see it, they were compelled to descend to the ground and walk out in front of the press stand, jostled meanwhile by the horde of "officials" who seem to do everything but officiate. The score board had but two lines on it—one for laps, the other for time. Whoever built it evidently thought a baseball battle was to be fought out. As each lap was finished, the assistant scorers would sponge out the official time of the car for the previous lap and chalk in the new time. Woe betide the pressman who failed to be on the job when the times were announced! If he wanted to get them later, if he couldn't borrow them from a fellow-reporter, he had to climb a ladder to the scorers' box, access to which was thus made purposely difficult to keep out "undesirables."



Robertson, the Locomobile Winner, Receiving from Mayor the Founders' Week Cup.

Acme Moving Some on a Straightaway Stretch.

The race was unique in several respects. In the first place it was held over a course within a half-hour's ride of a city of a million and a half of people, who could reach the scene of the contest by the expenditure of a nickel. Besides, it was a practical holiday, being the last day of a most successful series of public spectacles in honor of Founders' Week. Visitors from out of town who had never seen an automobile race flocked to the park by tens of thousands. Any portion of the course could be reached via park trolleys for an additional nickel, and but for this fact and the numerous points of vantage around the entire eight miles of the course, there would have been such a congestion at the start-finish as to have seriously interfered with the race. The affair, however, was in the hands of the city. Mayor Reyburn, himself an enthusiastic autoist, felt the city's responsibility, and it was through the excellent work of the 1,500 police and Fairmount Park guards that the course was kept clear.

Quaker City Club Received Mayor's Praise.

The Quaker City Motor Club furnished the flagmen, and they and the "coppers" worked so well together that the Mayor went out of his way after the race to hunt up the Quaker club committee and congratulated them on the thoroughness of their arrangements. Almost the entire eight miles of the circuit had to be roped off, so dense were the crowds. At those points where there was possibility of an accident, the spectators were especially numerous. Sinuous Sweet Brier hill, where the Thomas went out with a broken crankshaft, was an especial favorite with the morbid bloodthirsty ones who scented a possible tragedy; so were Neill drive, and the "Y" turn at the T. A. B. fountain. Here it was that the "cops" had their work cut out for them.

The course, while well policed, was not well suited to the purposes of the speedsmiths. In the first place it was too short—less than eight miles—and had too few straights in it. Those drivers who attempted to take liberties with it suffered the penalty. Michener and his Lozier "45" were eliminated by a tricky "Y" turn at the foot of George's hill. "Mitch" attempted to take the turn at too high a rate of speed, and over the Lozier went. Thousands of the spectators who had gathered there hoping to see some such calamity rushed to the scene. Fortunately, the force of police just there was a heavy one. and they beat the crowd back while the unfortunates were being put on their feet. Neither was seriously hurt, and a few minutes later both were perched in their wrecked car smoking as unconcernedly as if a spill were an everyday affair and watching the other contestants striving for the prize they had hoped to win.

Apperson Which Figured Prominently in the Battle.

A few minutes later the little Maxwell "28" broke its crankshaft on the ugly "S" turn on Neill drive, and Bittner and Smith dragged their car to the side and watched the race from that vantage point. Then the Stoddard-Dayton was stopped for nearly an hour with valve trouble, and got going again only to be stopped on the next round by a stripped pump gear. Next the big Thomas, which had been burning things up, came to grief with a broken crankshaft while descending Sweet Brier hill. The Pullman "40," driven by La Roche, broke a wheel at the bumpy Belmont avenue crossing, and retired. The other retirals were voluntary, being ascribable to the loss of time due to tire troubles, with no hope of catching up.

The control stations were lined up for half a mile along Belmont avenue. Here it was that the men "behind the guns"—those whose work renders success possible—labored like fiends, with thousands looking on and applauding their efforts. Each time a car would run up to the long platform the crowd would surge nearer to get a view of what was doing, and the numerous "cops" on duty here had their hands full maintaining sufficient elbow room for the repair and tire men to work unhindered.

TABULAR STORY OF THE 200-MILE RACE FOR THE FOUNDERS' CUP, IN FAIRMOUNT PARK, PHILADELPHIA, SATURDAY, OCTOBER 10, 1908.

No.	CAR	1st Lap	2nd Lap	3rd Lap	4th Lap	5th Lap	6th Lap	7th Lap	8th Lap	9th Lap	10th Lap	11th Lap	12th Lap
10	LOCOMOBILE	9:52	19:36	29:07	38:07	48:04	57:31	1:06:55	1:16:26	1:25:48	1:35:16	1:44:33	1:54:12
14	ACME	10:19	20:26	30:32	40:43	51:56	1:01:32	1:11:32	1:21:31	1:32:26	1:41:37	1:51:39	2:01:36
17	LOZIER	14:41	24:04	33:29	42:48	52:44	1:02:48	1:11:05	1:20:03	1:31:04	1:39:36	1:49:13	1:58:51
3	PEERLESS	9:57	24:24	34:23	44:31	56:51	1:05:14	1:15:04	1:26:11	1:36:37	1:47:14	1:51:41	2:08:02
9	LOCOMOBILE	9:59	19:37	29:11	38:45	48:20	57:51	1:07:25	1:17:04	1:26:37	1:36:14	1:45:57	1:55:31
2	APPERSON	10:28	19:39	29:11	38:41	48:15	59:36	1:11:05	1:20:34	1:29:56	1:39:30	1:48:52	1:58:23
11	AMERICAN LOCOMOTIVE	10:03	20:54	29:41	39:40	49:37	59:41	1:09:47	1:19:54	1:30:02	1:40:03	1:49:50	1:59:54
12	PALMER & SINGER	9:27	18:42	27:58	37:16	46:43	55:15	1:05:39	1:21:42	1:30:07	1:39:35	1:48:58	1:58:23
6	STUDEBAKER	12:40	22:45	33:09	43:32	54:23	1:04:27	1:14:50	1:25:29	1:35:38	1:46:03	1:56:12	2:06:19
16	PENNSYLVANIA	10:08	20:10	30:07	40:47	51:56	1:02:46	1:12:54	1:28:56	1:40:09	1:59:18	2:10:25	†
7	CHADWICK	11:33	23:23	33:16	43:18	53:53	1:11:40	1:29:28	1:39:50	1:49:55	2:00:06	2:29:02	2:38:58
5	THOMAS	8:57	17:37	26:32	38:47	47:32	56:22	Broke crankshaft.					
8	STODDARD-DAYTON	10:29	20:45	31:00	41:21	53:21	1:43:14	Valve hung up on 6th lap: stripped pump gear 7th lap.					
4	PULLMAN	10:44	24:34	34:23	47:20	Smashed left rear wheel.							
1	MAXWELL	11:31	22:42	33:46	Broke crankshaft.								
15	LOZIER	9:47	Tire blew out: car overturned at T. A. B. Fountain turn.										

No.	CAR	13th Lap	14th Lap	15th Lap	16th Lap	17th Lap	18th Lap	19th Lap	20th Lap	21st Lap	22nd Lap	23rd Lap	24th Lap	25th Lap
10	LOCOMOBILE	2:03:43	2:13:09	2:22:28	2:32:11	2:46:31	2:55:53	3:05:14	3:14:41	3:24:03	3:33:30	3:43:15	3:52:52	4:02:30
14	ACME	2:11:38	2:21:37	2:31:31	2:41:27	2:51:26	3:02:38	3:12:49	3:23:15	3:33:33	3:43:49	3:54:09	4:04:26	4:14:54
17	LOZIER	2:08:32	2:18:08	2:31:58	2:42:12	2:51:47	3:01:30	3:11:13	3:26:45	3:36:21	3:45:54	3:55:30	4:06:55	4:17:26
3	PEERLESS	2:18:17	2:26:46	2:38:41	2:49:08	3:01:22	3:11:20	3:21:25	3:31:29	3:41:29	3:51:29	4:01:28	4:11:35	4:21:26
9	LOCOMOBILE	2:05:13	2:14:5[illegible]	2:24:46	2:34:36	2:46:21	2:56:53	3:05:44	3:15:22	3:27:39	3:37:37	4:03:30	4:14:56	*
2	APPERSON	2:07:50	2:17:20	2:26:46	2:39:11	2:48:46	2:58:17	3:07:50	3:17:36	3:47:59	†			
11	AMERICAN LOCOMOTIVE	2:09:53	2:19:59	2:29:57	2:40:00	2:49:55	2:59:58	3:10:01	3:20:00	†				
12	PALMER & SINGER	2:07:48	2:26:32	2:36:10	2:45:33	2:54:31	3:04:15	3:13:41	3:27:59	†				
6	STUDEBAKER	2:16:29	2:59:23	3:09:30	3:19:49	3:30:02	3:45:14	3:55:43	*					
16	PENNSYLVANIA													
7	CHADWICK	†												
5	THOMAS													
8	STODDARD-DAYTON													
4	PULLMAN													
1	MAXWELL													
15	LOZIER													

*Still running when race was stopped.
†Dropped out.

Sample Stretch of the Average Road in the Thousand-mile Reliability.

CHICAGO, Oct. 12.—Progress made in the construction of American automobiles in one year is furnished by the results of the four-day 1,000-mile reliability run of the Chicago Motor Club, which was finished last Friday and in which five of the seventeen cars that started were hall-marked perfect both for the road work and mechanical efficiency at the finish, when the technical committee made a rigid scrutiny of the survivors: two Haynes cars, a roadster and a touring car; a Pierce Arrow touring car, a Premier roadster, and a Franklin touring car, being found to be without a loose bolt or nut, without a broken part, with all wheels true; in fact, there was not the slightest chance for the technical committee to find fault. A year ago, when this same club promoted a three-day run of 600 miles and in which thirty-five cars competed, only one was found perfect at the end. There were a dozen which had escaped penalization on the road, but the mechanical examination disclosed broken parts or something loose that eliminated all but Nutt's Haynes roadster. The scrutiny of Messrs. Beecroft, Edwards, and Nadall last Friday night, however, failed to bring to light a single instance of a loose nut even on the thirteen cars examined, while it was a remarkable fact that every engine was hitting as regularly as if it had just come out of the tester's hands. That's a remarkable testimonial to the efficiency of the 1908-1909 crop of American-built cars when it is remembered that these five perfect machines had just run 1,000 miles without an adjustment, without a break of any sort, and with the motors running all the time outside of controls.

The Chicago Motor Club contest was a remarkable one in many ways, for in it were included three different angles—car reliability, tires, and gasoline consumption, in each division of which there were prizes offered.

The tire competition was entirely new in American competitions, this being the first time any promoting organization has attempted to tabulate the work of the pneumatics. It was rather an awkward proposition to tackle, but the technical committee evolved a set of regulations by which the penalizations against the different makes of tires were computed on a basis of 2 points per man per minute of labor, whether inflating or changing inner tubes or casings. No difference in penalty was imposed between punctures and blowouts, the only criterion being time spent. No additional penalties were imposed where demountable rims or quick detachables were used. Any make of tire eligible for the trophy had to be represented by two complete sets, but the only makes so represented were the Diamond and Goodrich, the former having six cars and the latter three. The Diamond was the winner, having a penalty of 11.4 points average against each tire, or a total of 274 points against the twenty-four tires. The Goodrich had an average penalty of 25, or a total of 300 against the twelve tires. The Apperson and No. 14 White, both fitted with Diamonds, went through without a puncture, or any work done on them.

While economy tests are no new propositions, the one held in connection with the Chicago run was the longest on record and shows more than any of the others, for the conditions were the same as the average tourist encounters. There was no adjustments of carbureters to make a good showing in this line, for the main consideration was the reliability end of the event, and so the contestants had to pay the greatest attention to that, with the result that the gasoline showing can be taken as an excellent criterion of the abilities of the various cars in the fuel consumption line. The trophy in this was put up by the Standard Oil Company, and was awarded for the smallest consumption under the Chicago Motor Club formula, in which the weight of the car with load was divided by the fuel consumption in ounces. Under this formula the winner was the Premier roadster, driven by Ray McNamara, which showed a pound mileage of 224.1. But the Premier also distinguished itself in the line of straight fuel consumption regardless of the formula, for it used the least gas of any, going through the four days, on 69 1-4

Perfect Score Haynes Touring Car, Wagoner Driving.

Perfect Score Haynes Runabout, Nutt D[illegible]

gallons, or an average of 15.18 miles per gallon. Altogether two main trophies were offered by the club, one for roadsters and the other for touring cars, as well as medals in the various classes, which were made according to price. The results brought about two ties in the roadster division in which the Haynes and the Premier were perfect, while there were three touring cars, the Franklin, Haynes, and Pierce-Arrow, without a mark against them. There will be no run-off, however, the club officials declaring that the cars have done all that was asked of them and that they can see no reason to ask the entrants to continue in what really means a test in which the main objects is to wreck the survivors, whereas the object of the original test was to demonstrate the efficiency of the modern car. The classes did not fill as well as expected, and in consequence there were several walkovers. Class E, for touring cars costing from $2,000 to $2,499, secured the keenest competition but brought about no winner, the Franklin and Haynes having perfect scores.

The report of the technical committee on the winners in all three competitions is an interesting one and is as follows:

ROADSTER DIVISION WINNERS.

No.	Car.	Driver.
8.	Haynes, 35-horsepower	Frank Nutt
9.	Premier, 32-horsepower	R. McNamara

Class E, for touring cars costing $2,000 to $2,499—Franklin and Haynes, perfect; Marmon, 2 points; No. 14 White, 21 points; No. 12 White, 55 points.

Class H, for touring cars costing $4,000 and up—Pierce-Arrow, perfect, won.

OFFICIAL REPORT OF THE TIRE COMPETITION.

DIAMOND CONTESTANTS—

No.	Car.	No. of Tires.	Points Penalty.
5.	Apperson	4	0
14.	White	4	0
9.	Premier	4	52
16.	Haynes	4	68
19.	Marmon	4	68
8.	Haynes	4	86
	Total	24	274

Total penalty 274 points divided by 24 equals 11.4.

GOODRICH CONTESTANTS—

No.	Car.	No. of Tires.	Points Penalty.
20.	Pierce-Arrow	4	24
7.	Pierce-Arrow	4	32
15.	Franklin	4	244
	Total	12	300

Total penalty 300 points divided by 12 equals 25 points.

Particular attention is called to the Diamond tires fitted on cars No. 5 and 14, all of which went the 1,000 miles without work of any nature being done on them. In addition to the cars fitted with Diamond and Goodrich tires, there were four others fitted respectively with Hartford, Ajax, Michelin, and Fisk tires, the last mentioned being attached to demountable rims. Their standing is as follows:

12.	White	Fisk	20
8.	Mason	Hartford	76
2.	Maxwell	Ajax	210
4.	Mason	Michelin	246

Four other contesting cars which failed to complete the 1,000 miles of the contest, or did not check into the night garage, had no recognition taken of the tires used.

Premier Perfect Score Performer, McNamara Driving.

Franklin Clean Score Survivor, Carris Driving.

Pierce-Arrow Which Survived Faultlessly, Hofmann Driving.

TOURING CAR DIVISION WINNERS.

No.	Car.	Driver.
15.	Franklin, 28-horsepower	C. S. Carris
16.	Haynes, 36-horsepower	L. Wagoner
20.	Pierce-Arrow, 60-horsepower	P. Hofmann

The final standing of the field was as follows:

ROADSTERS.

No.	Car.	Score.
8.	Haynes	Perfect
9.	Premier	Perfect
7.	Pierce-Arrow	Perfect
5.	Apperson	1 point
3.	Mason	32 points
11.	Ranier	224 points
6.	Midland	Withdrawn
1.	Reliable Dayton	Withdrawn

TOURING CARS.

No.	Car.	Score.
15.	Franklin	Perfect
16.	Haynes	Perfect
20.	Pierce-Arrow	Perfect
4.	Mason	2 points
19.	Marmon	2 points
14.	White	21 points
2.	Maxwell	51 points
12.	White	55 points
17.	Studebaker	Withdrawn

No winners were reported in classes A and F owing to the withdrawal of the Reliable Dayton in the former division and the lack of an entrant in the latter. Winners in the other classes were:

Class B, for cars selling from $1,000 to $1,999—No. 3 Mason, 2 points, winner.

Class C, for cars selling from $2,000 to $2,499—No. 5 Apperson, 32 points, winner.

Class D, for cars selling from $2,500 up—Haynes and Premier, perfect; Pierce-Arrow, 1 point.

Class E, touring cars costing up to $1,999—No. 4 Mason, 2 points, winner; Maxwell, 51 points.

RESULTS OF THE GASOLINE CONSUMPTION TEST.

No.	Car.	Passenger Load.	1st D. Gal.	2d D. Gal.	3d D. Gal.	4th D. Gal.	Weight Load.	Total Con.	Pound Mileage.
8.	Haynes	3	21	22 1-2	21	20 1-4	3,675	64 3-4	198.
9.	Premier	3	19	13	20	17 1-4	3,585	69 1-4	224.1
4.	Mason	4	19	15	20	15 3-4	2,735	69 3-4	170.
15.	Franklin	4	18	15	22	15 7-16	3,255	70 7-16	200.
2.	Maxwell	4	16	18	21	19 3-8	2,950	74 3-8	171.3
3.	Mason	4	24	20	24 1-2	18 7-8	2,615	87 3-8	119.
16.	Haynes	4	28	22	23	20 7-8	4,000	93.7-8	184.5
5.	Apperson	3	26	22	24	24 3-4	3,420	96 3-4	153.
7.	Pierce	3	29	27	28	26	4,230	110	169.5
19.	Marmon	4	34	31	27	27	5,060	119	183.5
20.	Pierce	6	32	30	35	31 1-2	5,575	128 1-2	187.5
14.	White	4	39	33	38	35 3-8	4,630	145 3-8	137.9
12.	White	4	43	35	40 1-2	34 1-2	4,765	153	134.5
1.	Reliable Dayton	4	Withdrawn.						
6.	Midland		Withdrawn.						
11.	Rainier	3	Withdrawn.						
17.	Studebaker		Withdrawn.						

Upon the completion of the run Friday afternoon each car was officially weighed with its load, then sent to Eighteenth street between Indiana and Prairie avenues for the brake and clutch tests, in both of which all the survivors showed up exceedingly well. From that point the cars were sent back to the garage and turned over to the technical committee for the mechanical examination. At that time there was nine cars left with perfect road scores, but the examination put out four of them. The Pierce-Arrow roadster was penalized a point for its fan belt being off. It was lost the first day, but the car ran without one the rest of the journey, Kumpf not desiring to be penalized for breaking a seal. The Marmon lost a point for its fan belt being off, while another point was added for a leak in the air line that creates the pressure on the gasoline feed. The No. 12 White was found to have its oiler chain off the sprocket, which cost it 20 points, while another point was given for the fan being out of commission. The No. 4 Mason was penalized 2 points for the two threaded locking bushings on the front end of the rear strut rods being loose.

Only four cars were penalized during the actual run and four others met with mishaps that caused their withdrawal. The Maxwell was penalized for magneto trouble, while the No. 3 Mason was demerited on every one of the four days. The Apperson drew 22 points on the third day when it was necessary to break a seal to repair an oiler belt. The No. 14 White was penalized the fourth day when its oiler chain slipped off. Of the four cars that were withdrawn, the Reliable Dayton went out the first day with a broken frame. Six holes had been bored in it to permit of lamps being attached. This weakened it so that when the car hit a culvert near Kenosha the frame broke. The car ran the last day as a non-contestant. The Midland smashed a wheel the second ray turning off the road because of new gravel, but went in again as a non-contestant. On the fourth day it again met with hard luck breaking a frame.

"Beating it" was responsible for the Rainier breaking its frame, the car being withdrawn the second day, but going through the full 1,000 miles, being first home all of the four days. The last two days the car was driven by A. M. Robbins, manager of the Chicago branch, and it experienced no trouble. The Studebaker also was one of those to be withdrawn. Its first mishap occurred the first day when a pinnion gear in the differential was stripped through a broken ball. On the third day the car skidded on the wet cobbles in South Chicago and broke a wheel. It went through the entire 1,000 miles, however.

The first day's run was over a course taking in Kenosha, Janesville, and Rochelle, the distance being 262.7 miles. The second day the cars went via Aurora, Ottawa, and La Salle, 241.8 miles; the third day to Crown Point, Valparaiso, La Porte, Plymouth, South Bend, Michigan City, Hobart, and Hammond, 257 miles, and last to Rockford, Oregon and Rochelle, 230 miles.

SCORE OF THE 1,000 MILE RELIABILITY RUN OF CHICAGO MOTOR CLUB, OCTOBER 6—9, INCLUSIVE, 1908.

No.	CAR	Div.	Class	H.P.	Bore	Stroke	No. of Cyl.	Tires	Driver	1st Day	2d Day	3d Day	4th Day	Ex.	Total
8	HAYNES	1	D	36	4 3-4	5	4	Diamond	Frank Nutt	0	0	0	0	0	0
9	PREMIER	1	D	32	4 1-2	4 1-2	4	Diamond	R. McNamara	0	0	0	0	0	0
15	FRANKLIN	2	G	28	4 1-4	4	4	Goodrich	C. S. Carris	0	0	0	0	0	0
16	HAYNES	2	G	36	4 3-4	5	4	Diamond	L. Wagoner	0	0	0	0	0	0
20	PIERCE-ARROW	2	H	60	5	5 1-2	6	Goodrich	P. Hofmann	0	0	0	0	0	0
7	PIERCE-ARROW	1	D	43	4 1-2	4 3-4	6	Goodrich	Kumpf and Keller	0	0	0	0	1	1
4	MASON	2	E	20	5	5	2	Michelin	F. M. Harn	0	0	0	0	2	2
19	MARMON	2	G	50	5 3-8	5	4	Diamond	Shafer and Stillman	0	0	0	0	2	2
12	WHITE	1	G	30	3×6	4 1-2	2	Fisk	Leitch and Condon	0	0	0	0	21	21
5	APPERSON	1	C	30	4 3-8	5	4	Diamond	N. McLain	0	0	22	0	2	24
2	MAXWELL	1	B	20	5	5	2	Ajax	J. Muntwyler	24	0	0	0	27	51
14	WHITE	1	G	30	3×6	4 1-2	2	Diamond	Sheridan and Phillips	0	0	0	34	21	55
3	MASON	1	B	20	5	5	2	Hartford	F. S. Duesenberg	66	2	68	62	26	224
1	RELIABLE-DAYTON	1	A	21	5 1-8	4 1-2	2	Goodyear	C. L. Halladay	Withdrawn; non-contestant last day.					
6	MIDLAND	1	C	32	4 1-2	5 1-4	4	Diamond	Hayes and Hall	0	Withdrawn; continued as non-con				
11	RAINIER	1	D	45	5	5 1-4	4	Fisk	M. Hagelstine	0	Withdrawn; continued as non-con				
17	STUDEBAKER	2	G	27	4 1-8	5 1-4	4	Diamond	G. Smithson	Withdrawn; continued as non-con.					

DIVISION 1—RUNABOUTS.

DIVISION 2—TOURING CARS.

Class A—Selling for less than $1,000. Class C—Selling for $2,000 to $2,499. Class E—Cars costing up to $1,999. Class G—Cars costing $2,500 to $3,999.
Class B—Selling for $1,000 to $1,999. Class D—Selling for $2,500 to any limit. Class F—Cars costing $2,000 to $2,499. Class H—Cars costing $4,000 and up.

NARRAGANSETT PARK AGAIN THE SCENE OF RACING

PROVIDENCE, Oct. 12.—The race meet of the Rhode Island Automobile Club on the mile circular track at Narragansett Park was marked by the most daring and exciting automobile racing that New England has seen, the smashing of the track records, and two accidents in which two drivers escaped death by a miracle. The meet was attended by upwards of 7,500 persons, and was a success from every standpoint. The several events were run with regularity, with not more than five minutes' wait between any two of them, and had it not been for the accidents, the meet might be classed as ideal.

Both accidents happened at the same place on the track, at the three-quarters mark, and both occurred within an hour. The first was when Joseph Wilcox, of Beverly, lost control of his machine when rounding the curve. The car crashed through the fence, plunged into a ditch, and overturned. Wilcox was thrown out and landed upon his back, injuring his spine. The crowd surged upon the track, and after being driven back by the police the injured man was removed to St. Joseph's Hospital, where he was placed on the list of those dangerously injured.

In the second heat of the race for gasoline cars of all horsepower, Arthur Lee, of this city, while leading in the first lap, struck an obstruction of some sort in the track while the machine was skidding around the same curve. The wheels were jammed, the car tipped forward, made a complete somersault, and pitched over into the ditch. Mr. Lee was thrown about twenty feet, and had he not struck clear of the ground upon which the machine fell, would have been crushed to death by the mass of wood and iron into which the car was speedily reduced. The summary:

STOCK STEAM CARS.

1.	Stanley	F. W. Marrtott	5:28 3-5
2.	Stanley	W. R. Files	6:16 2-5
3.	Stanley	A. C. Trimble	

GASOLINE STOCK CARS, 15.1 TO 24-HORSEPOWER.

1.	Chalmers-Detrott	Oliver Light	6:48 3-5
2.	Ford	C. A. Edgecomb	7:06 2-5
3.	Ford	James Myers	

GASOLINE STOCK CARS, 40.1 TO 60-HORSEPOWER.

1.	American Locomottve	Grant	5:14 4-5
2.	Welch	L. S. Rogers	5:34
3.	Stearns	C. Stafford	

EXHIBITION MILE RACE AGAINST TIME.

1.	Flat-Cyclone	Ralph De Palma	:52 3-5

Old record, 54 seconds.

SPECIAL RACE, for Gasoltne Stock Cars all Horsepower.

First Heat.

1.	American Locomottve	Grant	5:14 4-5
2.	Pope-Hartford	H. A. Capron, Jr.	5:15

Second Heat.

1.	Welch	Rogers	5:17 2-5
2.	Stearns	C. Stafford	5:23 4-5

Final Heat.

1.	American Locomotive	Grant	5:13 3-5
2.	Pope-Hartford	H. A. Capron, Jr.	5:15 1-5
3.	Welch	Rogers	

FREE-FOR-ALL.

1.	Flat-Cyclone	Ralph De Palma	4:26
2.	American Locomotive	Grant	5:16 2-5
3.	Flat	Crafford	

THE UTILITY OF AUTOMOBILE CLUTCHES

By THOS. J. FAY, E. E., President Society of Automobile Engineers.

CLUTCHES may be classified as follows: (*a*) *cone,* (*b*) disc, (*c*) band; cone clutches may, in turn, be subdivided as follows: (*a*) metal to metal, (*b*) leather faced, (*b*) cork insert; while disc type may be classed as: (*a*) leather faced, (*b*) multiple disc, (*c*) cork insert; and band clutches may be put down as of the (*a*) constricting, (*b*) spiral, or (*c*) expanding types. Clutches, of whatever type or class, have but one prime object, *i.e.,* to enable the operator to start and stop the car without having to stop the motor. There is a secondary consideration, if we take into account the fact that it is convenient to be able to slip the clutch, on occasion. Some types lend themselves to this secondary purpose with greater facility than others, and it is also true that some clutches are most easy of application, all things considered.

With clutches, the temptation is to champion some one type. This temptation is dictated, perhaps, by limited experience, for the most part. If one becomes accustomed to using one type it naturally influences his inclinations, and he ultimately arrives at a point where he is blind to the perfection of types with which he has had the least to do. It is not too much to say, that of all the types of clutches known in connection with the automobile, none are so inferior as to fail to work, if they are properly designed. On the start, then, it is proper to point out that, in service, clutches may be of any type and still be so good as to be commendable.

Few Clutches That Are Utter Failures.

Every autoist has his preference, as is amply borne out by the fact that every type of clutch mentioned is now represented on the automobile, and the volume of business is equal to the output in nearly every case. How futile it is, then, to deny to a type of clutch the place it actually holds, in spite of the fact that one would not have to go far to find a defamer who would be willing to swear that certain types are useless. If we proceed in an unbiased manner to a full investigation of clutches, with the idea of realizing correct methods of design and with the hope of shedding light upon the materials to use, not forgetting that in the manipulation of clutches something is to be gained by favoring the several types in a way consistent with their respective characteristics, the result will be of benefit to the designer, the constructor and the user.

To show the extent to which the clutch question persists in occupying the minds of designers, it will only be necessary to relate a circumstance or two. In one of the best-known cars its design and development was attended by the construction and use of some thirteen different clutches, representing all the types known to designers. All the clutches worked so well that the car might have been put on the market, with any one of them, and have made a success. The history of several of the better-known cars is largely the same. The clutch seems to have attracted the notice of the designers with more frequency than any other one essential. In some cases good clutches were superseded by others that proved to be far inferior. Of course, this condition was not tolerated any longer than the time required to make another change.

It might be said, why make changes? Again, why stick to the "ox-cart"? It is easy to see that clutches must be a bone of contention for some time to come. When the time arrives that speed changes can be made through the clutch, then will be the time to shed the sliding gear-set, and not before. Speed changes cannot be made through the clutch as a regular and continued operation now, nor will the future be likely to afford us more kindness in this respect. On the other hand, if motors ever do become as flexible as the six-cylinder advocates say they are now, all that will be required is a clutch that will stand slipping for short intervals of time, provided the slipping can take place under well-regulated conditions.

A well proportioned motor that delivers power in proportion to speed, over a considerable range of available speeds, would come very close to the point of eliminating the gear-set, without being so over big as to debar its use. This would hold good in the cases in which the aim would be utility, rather than the maximum possible speed. In other words, if the gear ratio is fixed for moderation, and the motor is provided with a little extra power, a clutch that will admit of slipping will then do the rest. But even with all the other facilities available, it would not be wise to take to the road without the gear-set unless the clutch would lend itself to the slipping operation, as there are spots in otherwise fair roads in which cars will stick and in which the power of the motor must be exerted to the maximum. A little extra flywheel would, of course, help out. This is a facility that is rarely afforded on account of the desire to reduce weight, even if it has to be taken out of the wrong place. In six-cylinder motors, the opportunity to realize nearly the gearless condition, assuming the clutch is so designed as to afford a due measure of slipping, is a good possibility, but the featherweight flywheel generally defeats the project. The most ill-behaved car the author ever had the misfortune to kill time in was otherwise so good as to be noteworthy, barring the bucking under severe conditions, in the absence of enough flywheel to complete the cycle on the "high," in which gear it was said to be big enough to go through a mud hole.

With sufficient flywheel it would be possible to eliminate gear changes to some extent, if not entirely, provided the clutch would stand the slipping. It would have to slip to any desired degree. A "fierce" clutch would never do. Nor would one of the kind that would either hold entirely, or be entirely free. There are such clutches and they serve their purpose because the gear-set enables the operator to run the motor fast or slow, independent of the car speed, so that the power of the motor always matches the road conditions. Some clutches are prone to slip, in that they have not the requisite holding power. This is due to faulty design in every case, some difference accounting for the failure on the one hand, and the success on the other.

Why Is a Clutch Called "Fierce"?

This property seems to be characteristic of some types, and is rarely found in others. Those that are prone to exhibit this fault are kept in working order, as a rule, by taking such measures as will prevent this action, such as oiling. But others that lack the fault will hold just as well as the "fierce" kind. "Fierce" clutches are usually the kind in which the engaging movement is abrupt. In other words, from the instant of contact of the shoes to the point of "full on," the travel is short and quick. Certain toggle motions have this property. In cone clutches, certain angles are known as "sticking angles" and clutches in which such angles are found will be "fierce." Some clutches have a wedge motion, and if the wedge is so designed as to apply the pressure in a short travel, and the pressure is relatively great, a "fierce" clutch will result. In certain cam motions the same phenomenon will be noticed. The process is the same, in that the pressure is great and reached a maximum very quickly. "Fierceness" is sometimes a sign that the clutch is not powerful enough for the car. The adjustment has then to be so tight that the action is just about that which would be expected of a clutch in which the principle is wrongly applied.

A disc clutch, for illustration, can become "fierce," if the spring is too strong, the discs are too few, or of a radius less than that likely to produce good results, in the absence of oil. Without oil, this type fulfills the conditions of a "fierce," conical

clutch in that the distance (or time) of travel between initial contact and final maximum pressure is small. In a disc clutch it is the oil that introduces the factor of time since the oil has to be squeezed out from between the discs before the clutch will take hold sufficiently to drive the car. The slippery surface afforded by the lubricant will stay in place for a time depending upon conditions as follows:

(*a*) The pressure between the discs.
(*b*) The mobility of the lubricant.
(*c*) The distance the lubricant has to travel to escape.
(*d*) The unctiousness of the lubricant.

If the lubricant is lacking in mobility it will hold to a constant viscosity under the changes in temperature that are wholly unavoidable in a clutch. The absence of mobility is of greater importance than viscosity at some constant temperature. Body is something to take into account, in that the lubricant can easily have body in excess of that desired with the result that the clutch would not take a hold within the desired time, if at all. Just how slippery the surface should be, in a given clutch is something to determine, and the unctiousness of the lubricant must on that account be taken into consideration in calculating this factor.

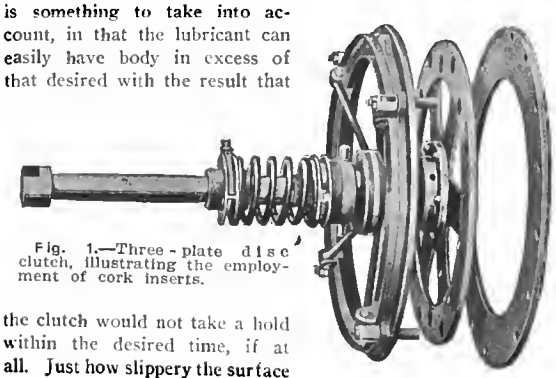


Fig. 1.—Three-plate disc clutch, illustrating the employment of cork inserts.

Clutches in which "cork inserts" are properly applied are probably as far away from the "fierce" condition as it is possible to go. Cork is a peculiar product and it performs in accordance with its peculiar characteristics. In the first instance, it has a high coefficient of friction, so that high pressure is not necessary, and its coefficient of friction is but little influenced by the question of lubrication. In other words, the cork will hold on a dry surface or if the surface is lubricated and the degree of polish of the surface is not a factor of such marked import as would be the case in the absence of the cork. High temperatures are not so prone to char cork as they would leather or fiber. This is an important matter in clutches. Even wood will be charred by the heat generated in clutches under certain conditions, which is fair evidence of the fact that the temperature can raise to a point as high as 500 degrees C.

Present Materials Not Suited to Slipping.

How futile it would be, then, to anticipate the use of leather, or fiber (compressed wood pulp), in clutches, with the idea of taking advantage of the slipping phenomenon, in the absence of change gear. Of course, cork is wood, but there is a decided difference as between wood and cork, as it is used in clutches. This will best be understood by illustrating the method of applying the cork. Fig. 1, showing a three-plate disc clutch, is a good illustration of its application; the middle disc is perforated and the perforations are filled with cork. The cork is pressed into the perforations so tightly that, in view of its elasticity, it overflows the holes and protrudes beyond the surface. As a result, the compression of the plates ends in a close contact of the cork inserts against the faces of the plates in juxtaposition, and in view of the high coefficient of friction of the cork, the negative torque of the clutch becomes a maximum.

If the pressure be great, the cork inserts compress sufficiently to become flush with the plate, but without losing the transmission value of the cork. This increase in pressure may bring the plates into metal to metal contact and if it does, the ability of the clutch will be increased. The ability of a clutch can be stated in terms of negative torque, and when the negative torque value equals the torque of the motor (positive torque) the transmission will be on a basis of 100 per cent.

In a motor the torque may be estimated as follows:

$$P = \frac{2\pi \ RS}{33{,}000}$$ In which:

P = pull in pounds (average).
π = 3.1416
R = radius of the lever arm.
S = angular velocity of the crankshaft (r.p.m.).

In a clutch, the negative torque may be estimated in the same way, taking into account the fact that a reserve factor is valuable, in order that the ability of the clutch will be well beyond the slipping point, when the motor is delivering its maximum power. If the negative torque of the clutch barely equals the torque of the motor, slipping will ensue for reasons as follows:

(*a*) Flywheel effect adds momentarily to the torque of the motor.

(*b*) The inertia component puts work on the clutch, under certain conditions.

(*c*) The condition of the clutch will not remain constant.

The best probable ability of the clutch might be regarded as that which would register a negative torque equal to about twice the average torque of the motor. This difference would be enough to insure the holding ability of the clutch, under all road conditions.

Design Must Depend on Other Features.

Let us take up one other phase of this subject, the question of the ability of clutches in the abstract, taking for illustration a clutch of say 20-horsepower at 1,000 r.p.m. It might appear at first sight as if this clutch would do for any 20-horsepower motor. But a motor can deliver 20-horsepower under several conditions of torque. In other words, the torque of all 20-horsepower motors would not be the same. The clutch, then, should be compared on a basis of torque and not of horsepower. If it is true that the negative torque of a clutch should be in excess of the torque of the motor, by an amount equal to 100 per cent., the formula would be as follows:

$$P' = \frac{2\pi \ RS}{33{,}000 \times Q}$$ In which:

P' = negative torque of the clutch.
π = 3.1416;
R = mean radius of the clutch bearing surfaces.
S = angular velocity of the clutch members;
Q = 0.50.

P' is the actual pull, and the coefficient of friction must be taken into acount in the process of determining the necessary pressure of the clutch spring. If the pressure is not directly applied, the angularity and the lever advantage must be allowed for. In a single pair of discs, pressed together by a spring, the pressure may be regarded as direct. In this case, if cork inserts are used, the spring pressure would have to be three times the value of P', on the ground that the coefficient would be about 0.33. To reduce the spring pressure, it would be necessary to do one of two things, i.e., (*a*), increase the mean radius of the members, or (*b*), increase the number of discs. Theoretically, the spring pressure would decrease directly as the discs increase, or inversely as the number of effective discs. Discs, to be effective, must be prevented from rotating.

Considering the Multiple Disc Type.

The number of discs must be limited, else the pressure between the respective surfaces would fall below the point of pressing the oil out from between them, on a basis of the reasoning as above set forth. On the other hand, the number of discs might be so great as to produce a clutching effect, due to the resistance of the lubricant used. The capillary attraction of all

lubricants is so great that the section of the lubricant is *sheared*, before the clinging effect of the lubricant is overcome. On this account, it is possible to so design a clutch using a large number of discs, that the work required to shear the numerous sections of the entrapped oil, will equal the ability of the motor, plus a reasonable reserve. In this scheme it would not be the idea to have the discs come into contact with each other at all. The slippery surface, due to the oil, would always interpose, and the oil would be the only part this would be consumed, and is all that would have to be replaced.

Some clutches of the multiple disc variety come so near to this ideal that it is necessary to select oil of a character almost devoid of unctuousness, and of almost no body. Mixtures of light mineral oil and kerosene are sometimes used for such purposes. Centrifugal force plays a part in the clutch if the radii of the members is sufficient to render this force potent. The oil is thus cast off and the members are then free to contact with each other. The phenomena termed drag is present in clutches of this character and it increases in direct proportion to the number of films of oil. This is explained in the same way that it is possible to show that a clutch can be so constructed that it is the shearing of the oil that affords the resistance necessary to set up the negative torque.

The drag is reduced if the discs are parted very much, for then the shearing moment is eliminated and molecular resistance is all there is to be overcome, again illustrating the effect of different grades of oil. While drag is a characteristic of clutches of the multiple disc genera, they are not valueless on that account, since drag can be the lesser of two evils. In the cone clutch the inertia of the mass is a detriment; the mass itself is not so great, but its radius is usually excessive. Cone clutches are from 15 inches to 18 inches in diameter and even aluminum weighs enough to be felt. It must be remembered, moreover, that the aluminum is covered with leather and the actual weight of the clutch rim is sufficient to set up a flywheel effect. This is most noticeable when the sliding gears are collided with each other. If the clutch rim is not carefully whittled down, to eliminate all possible weight, the sliding gears will soon show the effect of it.

In multiple disc clutches the radii are less, in view of the fact that the discs are about one-half the diameter of the rim of a cone clutch of the same ability. If we take into account the fact that the inertia of the mass is proportioned to V^2W (the square of the velocity multiplied by the weight), it is easy enough to see that diameter plays an important part, especially since the velocity is as follows:

$V = 2\pi Rs$ in which,
V = speed of the mass in feet per second,
$\pi = 3.1416$,
R = radius of the mass in feet (from the axis of rotation),
s = angular velocity in feet per second.

From the formula it would appear as if whittling the rim down to the smallest possible section is not nearly so good as reducing the radius as much as possible. The effect of mass is in direct proportion, while the effect of speed is as the square.

Can Slipping Be Taken Advantage of?

As clutches are at present designed, the question is, can slipping be tolerated? or, can clutches be slipped to control the speed of a car? It is believed not. The average clutch has very little of the character of the average braking system and when it comes to brakes they do not last so long that it is desirable to wear them out sooner than they will naturally need replacement. In other words, it seems quite out of the question to consider the clutches of to-day as suitable for the double purpose of clutching and speed controlling, by way of slipping the clutch at will. It is not uncommon to hear autoists talking of the multiple disc clutch as one that undergoes little or no deterioration as a result of continuous slipping under variations of load.

They seem to think that the large surface exposed, especially in view of the fact that the discs are submerged in oil, will prevent damage if the clutch is caused to slip. They forget that the discs are thin, and also that they are loose on the splines, keys, or feathers that prevent the discs from rotating. No member keyed onto a shaft will stand much abuse. This is especially so, if the member has but little bearing surface on the key. Even a considerable number of such members working in unison will fail to stand up under the work because the joint is not firm. Lost motion is bound to result in more lost motion in a short while, and in a multiple disc clutch the discs soon fray out and interfere with each other and the clutching functions, within a space of time so short as to surprise even those most experienced in the use of this type.

Tempered saw-blade steel, of some thickness, will stand quite some work of the kind in question, especially if the radius of the bore of the discs so made is considerable. If, however, the saw-blades are only one-half of the total number of discs, and the relating members are of bronze, it is not impoossible to anticipate which of the two links in the chain, as it were, will show distress, first and soon. One of the best clutches the author knows about is of the multiple disc type, in which all the discs are tempered saw-blade steel, and so designed that the pressure on the driving faces is very low indeed. This clutch runs in oil and the metal probably does not come together to the entire exclusion of all the oil, when the clutch holds and drives the car. This clutch will come near affording the speed regulating advantage, but it will give out sooner if it is caused to slip, than it will if it is confined to its legitimate function, and the difference in its life will be very great.

Slipping Cannot Be Tolerated.

Some designers are of the opinion that clutches, as now made, will stand any amount of slipping, and they will go so far as to point to their products as examples. The main trouble with some of these wonderful clutches is that they slip when they should hold, and they are also "fierce." In these clutches, "fierceness" is bound to follow adjustment, and as a result of the buffs that "fierce" clutches are heir to, the time they will stay adjusted is the time it takes to negotiate a fairly long hill of some grade pretensions. When it comes to the multiplication of driving faces difficulty is encountered in having all the faces bear equally. A dividing head on a milling machine is about the most exact device possible to use and the dividing head is not so exact as to assure equality of pressure. Even assuming that a dividing head would afford practical equality of spacing there is the cutter problem to master.

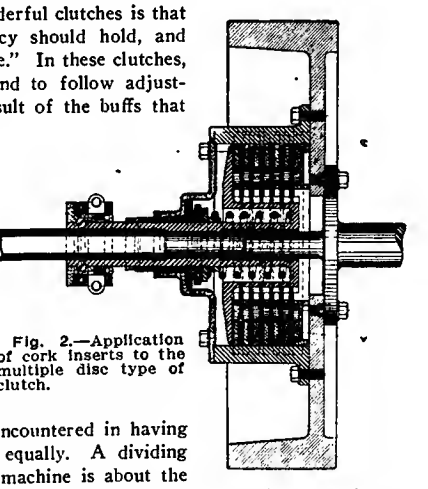


Fig. 2.—Application of cork inserts to the multiple disc type of clutch.

A comparatively small number of cork insert discs of sufficient thickness would assure immunity from key-way trouble. With a liberal section there would be little room for increasing the number, but the cork would make up for the smaller number of discs. Fig. 2 is a cross section and plan of just such a clutch and if change gears are provided to take the main work, then this type of clutch (Fig. 2) would be of excellent advantage in a pinch. There are those who think they can keep to the high gear under all and diverse circumstances. They can, to a large extent, if the clutch performance is considerably better than it is on cars that are not noted for their low first cost.

(To be continued.)

SPECIFICATIONS OF THE A. L. A. M. STANDARD SPARK PLUG

LIKE the A. L. A. M. standard screws, the standard spark plug has now been adopted by nearly all of the members of the Association of Licensed Automobile Manufacturers. The Mechanical Branch has spent much time in determining the features which it seemed advisable to standardize and in fixing dimensions. The spark plug, which has been known for several years as the "Autocar," can be described in a few words as having a ⅞-inch diameter, 18 pitch, straight thread, the form or profile of the thread being the so-called United States standard; that is, having flat top and bottom of a width of ⅛ of the pitch. This was the extent of the standard, and was really nothing more than a standard for a hole in a gas engine cylinder head. There was considerable opposition to standardizing any more than this of the spark plug. But as time went on it became clear that certain other elements of the spark plug should be defined. At first the Mechanical Branch signified its ideas in the matter by stating certain features or dimensions to be "preferred construction." However, it was some time ago decided to standardize certain further features and dimensions, still leaving other such matters as preferred construction.

The diameter of the thread, ⅞-inch, was considered necessary in order to leave the spark plug manufacturers plenty of room for insulating material in the plug. The straight thread, in combination with a shoulder or flange which seats upon a gasket close to the cylinder, always gives a gas-tight joint when the plug is screwed into the cylinder the same distance comparatively. In this connection the pitch of the standard, 18, is proper. It will be recalled that the pitch of the ⅞-inch diameter A. L. A. M. standard screw is 14, but there, another function, namely, holding power, and not a gas-tight joint, is the desideratum.

The stock used in the manufacture of the plug is 1 1-8-inch round; the hexagon head having a short diameter of 7-8 inch, being milled on this stock. This is distinguished from the construction where large hexagon-shaped stock is taken, and the part below the head turned down to a cylindrical surface. The shoulder, which is intended to seat upon a copper-asbestos type of gasket, has the same diameter as the round stock from which the plug is made, and is 1-8-inch thick or deep, having a face seating upon the gasket 1-8-inch wide.

The blank, or portion below the shoulder or flange, has a minimum length of 1-2-inch. The dimensions of this portion of the plug cannot be standardized owing to the requirements of the different types of engines, as water-cooled and air-cooled, and those having different thickness of water jacket, etc. There was considerable sentiment against even stipulating a minimum dimension for this blank on account of the tendency of any specific dimension to become standard, although intended only as a minimum or maximum. However, it was finally decided that it would be necessary in this case to specify a minimum dimension, in order to insure that in any case the blank would have a sufficent number of threads.

The question of whether the spark plug should have a recess adjacent to the shoulder was a subject of sustained debate. In this connection, previous current practice had material weight, as omitting the recess contemplated counter-boring the cylinder, whereas many thousands of engines which had been in use for some time were not counter-bored. In determining the diameter of the packing-gland nut head, that is, the separable portion of the plug which holds the insulation in place, one determining factor was that the distance across the corners of this smaller hexagon should be less than the distance across the flats of the larger hexagon, in order to make possible removing the plug from the engine with a socket wrench.

From the above it will be seen that all the essential features for a standard spark plug have been settled upon. At the same time ample leeway has been left in the matter of details to leave play for that competition which is characteristic in the business of the members of the Association of Licensed Automobile Manufacturers, and to leave the gates open for joint active inventive genius which is constantly perfecting such details.

CALL FOR COMMERCIAL VEHICLES IN THE FRENCH CAPITAL

PARIS, Oct. 3.—There are possibilities of an almost complete revolution in the building trades of Paris by the decision of the Builders, Contractors and Masons' Association to hold a competition for mechanical substitutes for three types of horse vehicles at present extensively employed. During the building of a very extensive subway, motor trucks have been employed almost exclusively for the removal of earth from the mouth of the boring to barges in the river. It is doubtless as the result of this successful work that the builders have decided to encourage the development of mechanical vehicles for the transport of large blocks of stone and for building material in general.

The first of the three types for which a mechanical substitute is requested is a two-wheeled, low-built wagon fitted with a bogey operated by a windlass, and used exclusively for carrying blocks of chisseled stone as used for foundations, facings, etc. The mechanically operated vehicle must be able to carry a load of five tons, must have metal-shod wheels, easy means of loading and unloading, an engine-driven windlass to help it out of difficult ground and a speed of not less than six miles an hour.

The second type is a long-bodied two-wheeled cart, enclosed at the sides, but open front and back, for the carrying of planks, scaffolding, ladders, and other cumbersome material. Its load capacity must be four tons, and its speed six miles.

The third type has a substitute already found in the tip wagons now extensively employed by large contractors. The regulations stipulate a vehicle capable of carrying five to six ton loads of sand, gravel, earth, etc., and of tipping them either at the rear or the side.

A ten hours' test under normal working conditions will be held for each of the three types, during which a minimum speed of six miles an hour must be maintained. It is stipulated that the motor trucks must accomplish all that the present horse vehicles perform, but full liberty is also left to designers to introduce improvements in the handling of loads. Rubber tires are barred, on account of the rough ground on which the vehicles will generally have to operate. An efficient winch, driven off the motor, is considered essential in order that there may be no difficulty in getting the vehicles out of the rough ground of building yards. The Builder's association guarantees to purchase the most successful vehicles taking part in the competition. The importance of the field thus thrown open to mechanical transport can be appreciated by the fact that the amount of material transported annually by the Paris building trade is estimated at not less than five million tons.

It is proposed that the 1909 Prince Henry touring competition shall be under the auspices of the German, Imperial, Bavarian, Austrian, and Hungarian automobile clubs, and that the event shall extend over six days. The projected route is from Berlin to Breslau, Brunn, Budapest, Vienna, Salzburg, and Munich, where the contest will end.

LETTERS INTERESTING AND INSTRUCTIVE

POINTS CONCERNING THE LAWS OF PHYSICS.

Editor THE AUTOMOBILE:

[1,583.]—Can modern automobile designers reverse the laws of physics to suit their passing whims? This question may seem absurd on the face of it, but my reason for asking it is because I notice in the epecifications of the Cbalmers-Detroit "30" and the new Columbia 30-horsepower model both bave exhaust valves considerably smaller than tbe intake valves. Tbis seems to me to be contrary to common sense, because tbe very cause for the engine's operating is the increase in volume of the gas after it is drawn into the cylinder. As no engine expands the gas down to atmospheric pressure or cools it to its original temperature, it is evident that tbere is more gas, by volume, to be exhausted than was drawn in. As this is tbe case, how can an engine with exhaust valves smaller than tbe intake work to best efficiency, especially at high speeds? If the intake valves were of the automatic variety, this combination of large intake and small exhaust is all right, because an automatic intake is more or less of a throttle, thereby cutting down the supply of gas; but on both the engines above mentioned the intakes are mechanically operated, hence none of the throttling. I do not mean to infer that I think the intakes too large, but that the exhausts are too small. This question of valve size may be a question for the designers to answer, but if you can I wish you would explain why they uss intakes larger tban exhauste.

Hoping that tbe designers of the above-named cars will see their way to explain this detail through these columns, I remain,

Worcester, Mass. FRED B. FAY.

In jumping to the conclusion that the designers in question have reversed a law of physics, you have apparently overlooked one of them yourself. The cylinder contains many more volumes at the end of the explosion than at the beginning due to the fact that the gas is under *far greater pressure;* hence, it escapes far more quickly. This is further aided by the fact that the lift of the exhaust valve is greater than that of the inlet in the two cars you mention, and this adds greatly to the effective opening of the valve port. The inlet valve is always made as large as possible in order to inspire the maximum charge, owing to the slight impelling force set up by the suction, and also to overcome the phenomenon known as "wire-drawing" at the higher speeds. But as its diameter is increased, the lift of the valve is decreased correspondingly. It is not merely a question of handling two volumes of widely differing proportions, but also one of the manner in which they are moved.

STEERING CONNECTIONS—DIFFERENT PLACING.

Editor THE AUTOMOBILE:

[1,584.]—Please tell me through "Letters Interesting and Instructive" why the connecting arms of automobile steering knuckles are bent toward eacb other when connected behind the axle and vice versa when connected in front?

Seattle, Wash. STEERING KNUCKLE.

The theoretical requirements of a perfect steering gear are that all wheel axles, when produced, *i.e.*, extended on the drawing board, should meet in a single point, but this is not carried out in practice. The rule now followed was introduced by one of the pioneer French designers, and consists of giving the steering knuckle arms such an inclination that when produced, they will meet at a point representing the center of the rear axle of the vehicle. It will be evident that in order to comply with this requirement, the steering knuckle arms, when placed forward, would have to represent a continuation of the lines passing through their centers when placed behind the axle. The reason for favoring a forward placing of the cross connecting rod of the steering gear, is that it is then under tension for most road shocks, beside giving a somewhat better action of the wheels where side slipping is concerned, and offering a slightly greater angular range than when in the rear. The chief reasons for placing it in the latter position are the improved appearance and greater protection thus gained, an increased angular range being obtained by narrowing the frame forward.

WANTS INTERNATIONAL BUGGY DESCRIBED.

Editor THE AUTOMOBILE:

[1,585.]—I am a subscriber to "Tbe Automobile" and I see that many automobile manufacturers are giving detailed reports on their machines in your magazine, ebowing all points about their macbines. I own an International bigh wheel auto-buggy, and bavs been eagerly searching for a good write-up and explanation of the International, but have looked in valn. I write to ask you to approach the good people of the International Harvister Company of America, to give the pubiic a good, explicit, and thorough explanation of tbe auto-buggy, as I believe that all owners of International auto-buggies, and others, would appreciate and read with interest sucb an explanation, for the reason that I believe most of such owners are amateurs, and it would be a good iesson for us. Get after tbe manufacturers, and have them come out in dayligbt and tell us what they know about their product.

Buffalo Lake, Minn. MRS. F. G. NELLERMOE.

Such an appeal, particularly when coming from an owner and driver of the fair sex, should certainly bring the desired result at a very early date, and we would accordingly refer it to the manufacturers of the International. If they will supply the necessary information, it will be given due attention in the near future. There are probably a great many other amateur owners, and not all of them owners of the high-wheel buggy type of automobile who would be pleased to learn a great deal more about the machines they own, so that makers and publicity men might take the hint and depart slightly from stereotyped descriptions.

A MONTANA MAN HAS HIS SAY.

Editor THE AUTOMOBILE:

[1,586.]—Referring to "Letters Interesting and Instructive," Nos. 1534 and 1553. In the former a typographical error would seem to bave crept in, as you state "coefficient is not as high as when two similar metals are used," wben the rest of tbe article would show that you had intended dissimiiar. In No. 1553, Mr. Rhodes takes you to task on your answer to "Brakes." My idea of "Letters Interesting and Instructive" is a source of aiding those who want to know, and not a meane of pulling and splitting hairs. Am I right? It would eeem to ms that your statement as to the "why" of using dissimiiar metals for brakes is concise, and I know it to be correct. The reason for using Babbitt and other white alloys is that they heat less, despite the fact that their coefficients of friction are to all intents and purposes the same as the harder metals, and that they lend themselves more readily to the inequalities of the driven or driving shafts.

Mr. Rhodes states that the sole reason for using different or dissimiiar metals is that they would wear too fast; this is not tbe sole rsason, with due respect to Mr. Rhodes. Friction is greatest with soft and least with harder metals; bronze is employed because it is softer than steel or cast-iron, and is still very tough; steel against steel would heat too rapidly and still would not give the required friction, except with greatly increased pressure over steel and bronze. As to the two flies, this only illustrates the rsiative positions of the fibres of the metals under consideration. It will be seen that two like metals will wear in the fibre evenly and the grains come to an amicable understanding, thus giving no resistance, while two dissimiiar metals will always be wearing in this respect, thus producing friction.

No. 1537. Possibly the fault is to be found in the msthod of driving. I have noticed that the average driver does not control sufficiently by spark advance and retard. If the escape screw on the carbureter is regulated to feed an average amount of gasoline, then by leaving the throttle down to the last notch on tbe ratchet and controlling by spark, the driver will find not only perfect control, but a very material decrease in fuel consumption. This does not mean that the throttle is not to be used at all, but on the contrary, that where the driving is being done on the nearly level stretches the throttle is to be closed, sxcept for the amount provided by the escape screw. In teaching to run, this seems to be the most difficult point to impress upon the minds of those learning, that "except in speeding and hill climbing, close the throttle to the last notch and accelerate entirely by means of the sparker; when more power is needed, leave the spark advanced and use a little more gasoline." Drivers of two-cylinder cars will soon find the advantage, and those of four and six-cylinder in direct ratio to the number of cylinders employed. They will also find that this method will put them close to the five-mile limit on high, as the advanced spark will give the required time for complete combustion in the cylinder chamber, thus utilizing all the gasoline energy

of a weak mixture. Would like to hear from a few who try this for the first time, as their experience should be interesting.

No. 1547, Ideal Car. May I take exception to three of the points? First, water cooling is not ideal, by reason of the fact that it necessitates the loading of the machine with dead weight in the way of the water carried. Would advise Mr. Lloyd to look into the Franklin, Cameron, and other air-cooled care. Second, two flexible joints are not necessary; one is all that is required, as in the Rambler. Flexible joints use considerable power. Third, the wheel base of 124 inches is excessive. How would one get around some of the sharp curves to be found on many of the roads in the country? This long wheelbase would make rapid work in cities very difficult, if not altogether impossible.

No. 1549. Mr. Evarts has mixed his dates a little. In railway and other grading the per cent. of grade is figured from the feet of rise, in each 100 feet on the level or horizontally by the engineers, though they may, of course, go it backwards, as has Mr. Evarts. Per cent. of grade is equivalent to the number of feet of rise in each 100 feet of the horizontal; thus 1 per cent. is a rise of 1 foot in 100 feet on the level; 10 per cent. is 10 feet rise; therefore, 100 per cent. would be 100 feet, and if he will take the trouble to draw the triangle he will find that this resultant is 45 degrees and not 100 per cent. of 90 degress, which comes to infinity, as you state. Hope that pie did not hurt the rest of the party.

It looks good to see at least one automobile manufacturer come down and be friends with the trade. Thank you, Mr. Duryea. Guess this will be enough for one week from

Butte, Mont. MONTANA.

A VALUABLE SUGGESTION FOR CLEANING.

Editor THE AUTOMOBILE:

[1,587.]—If you think the following suggestion would be of enough interest to your many readers to publish it, you are at liberty to do so. In 1900 I purchased my first automobile, since which time I have owned from one to three machines at a time. At the present I am the owner of two, a runabout and touring car. Yes, I have employed chauffeurs at different times, to my personal expense and regret, but for the past two years I have used my handy man about my country home for the care of my machine, such as washing, cleaning the brass, and keeping them in good shape, with instructions at the same time to clean the grease from the engine, but this latter part, for some reason, is usually neglected, and from time to time I find it necessary to roll up my sleeves and with the aid of my handy man, give my engine and other working parts a thorough cleaning.

Only a few days since in going over and cleaning the grease from the engine, shafts, and other parts, I commenced with a can of gasoline and a paint brush, and after more than an hour's hard work I managed to remove a good portion of the accumulated grease and dirt, and after another hour's hard rubbing with waste, rags, etc., I succeeded in doing a job which would pass inspection, but after finishing I noticed there were certain parts of the engine and under parts of the differential gears and placee which were hard to get at, had not been properly cleaned, largely on account of their inaccessibility. Just at that stage of the cleaning process I happened to notice a brass hand torch, or so-called plumber's gas furnace, such as is used for heating solder irons and found in most garages, and right here is the point of my suggestion. I pumped it up to give as much pressure as I could by hand, opened the valve and found I had a good strong pressure, and was surprised to see how rapidly and thoroughly it removed all the grease from parts which I could not get at otherwise, such as bolt heads, small screws, and other parts which were impossible to reach by hand.

The thought occurred to me, if some inventive genius could get up a suitable spray used in connection with a compressed air tank suitably arranged with connections and a tube, that it would be a quick and easy way to clean grease and dirt from the engine. Everybody knowe the process of whitewashing and painting by spraying, also the familiar process of sand-blasting for cleaning the fronte of buildings, and the thought occurred to me, if something could be invented to use as a spray with gasolene, that it would be a boon to automobile owners as well as chauffeurs, as the cleaning of an engine could be accomplished in not only a quarter of the time, but in a more satisfactory manner. If you think the suggestion practical and any inventive genius cares to take advantage of it, he is welcome to it. THOS. C. SNEDEKER.

New York City.

WHAT ONE MAKER'S TRUCK DEMONSTRATES.

Editor THE AUTOMOBILE:

[1,588.]—You might be interested to know of an experience with one of our three-ton trucks last week. This machine is hauling lumber twenty-two miles, from Tully to the Solvay Process Co., Syracuse. The machine is making one round trip a day, or about forty-four miles, and is hauling from four to five tons of lumber. The total load of approximately 15,000 pounds is so much greater than the roads are accustomed to that the towns have been obliged to replank the bridges along the way, one after another, because of the danger of the truck breaking through. Last week, while coming out of the Solvay property at Tully, with a five-ton load of plank, it was necessary to cross a wooden bridge which spanned a narrow ditch. When the rear wheels struck the bridge, the driver felt something go, and the bridge and machine settled gently on one side and the truck and load turned completely bottom side up in the ditch. The truck was released from its load, and in some way was righted. We give our driver credit for a pretty clever piece of work in getting this machine on its legs again without a particle of equipment of any description to assist him.

Examination showed that only about one gallon of gasoline remained in the tanks. Because the car being completely turned over, the gasoline had escaped through the vent holes in the top of the tanks. As far as the driver could discover, the machine looked all right, and, on trying the engine, everything appeared O. K., and so he put his five-ton load on again and started for Syracuse. After a short distance his gasoline gave out, and he was hung up for two or three hours until a passing machine loaned him fuel enough to bring him to the city. The truck finished its trip as usual, and, so far as we can discover, there was not the slightest damage sustained by the machine in its upset.

We think that this is a most remarkable demonstration of the flexibility of the wood-slil construction of the Chase truck, as we do not believe any steel frame could have withstood the enormous twisting action caused by the rear end of the truck tipping over and pulling the front with it. As compared with the horse, we think that a mix-up of this kind would have resulted in about as spectacular a runaway as could have been desired.

Syracuse, N. Y. CHASE MOTOR TRUCK CO.,
S. M. CHASE, Pres.

BRITISH MANUFACTURERS AND MOTOR RACING.

Editor THE AUTOMOBILE:

[1,589.]—The views which have been expreesed with regard to dangerous motor racing have interested and impressed me greatly.

There can be no doubt that the rapid development of the automobile has in the past been very largely due to racing, and the public undoubtdly then took a great interest in it; but recent utterances have devioped the fact that there is now an immense volume of public feeling against dangerous racing, and that there is a general idea that the automobile is developed and estahlished so sufficiently that racing demonstrations of an extreme type ere no longer neceesary.

As one who has been responsible for most of the racing in the Britisb Isies, I think it may perhaps be my duty in deference to public feeling to be the first manufacturer to publicly announce my intention of withdrawing Napier cars from all dangerous competitions.

In making this announcement I hope the public will accept my assurance that my sole object in automobile racing in the past was to demonstrate the ability of a British manufacturer to hold his own in this high type of engineering against any one in this world, notwithstanding the long start our faulty legislation gave our foreign competitors in this great industry. I feel that that object has now been achieved, and that the British motor-car now leads in type, design, and workmanship.

This matter is a serious one for the manufacturer; and it is possible that abstention from racing contests may, as some think, react upon my firm. I must therefore qualify this declaration of my withdrawal from abnormal contests by claiming liberty to lead the way again if I have mistaken the trend of public feeling.

London, England. S. F. EDGE.

WHAT IS NORMAL COMPRESSION?

Editor THE AUTOMOBILE:

[1,590.]—In the September 10 issue under the head of "Suggestions for the Man Who Drives His Car," by Thos. J. Fay, he uses the expression: "Compression is normal." How do you determine this and by what instruments?

Kingman, Kas. GEO. C. TREDICK.

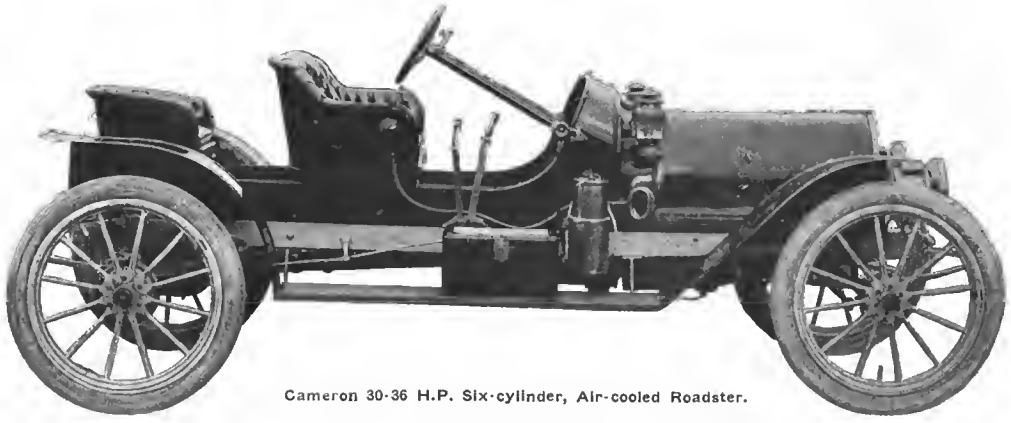
Normal compression in any given design of motor would be the compression (cold) fixed by the designer by the relation of the sweep of the piston to the clearance space. Normal compression is not the same, as measured in pounds per square inch, in all motors. The normal compression as against "loss of compression" would be evident to a motorist in the act of cranking. Were the compression to become abnormal, as a result of carbon deposit, it would be rendered manifest by knocking on a gradient or by way of pre-ignition.

The cold compression can be found by means of a "gauge" reading to about 90 pounds per square inch. Screw the gauge into the threaded hole, normally used for the spark plug. Another way is to use a spring balance, hooked to the starting crank, and by a steady up pull, against the compression, the pull in pounds resultant of the compression may be noted.

THOS. J. FAY.

Brooklyn, N. Y.

CAMERON AIR COOLERS IN 4- AND 6-CYLINDER MODELS

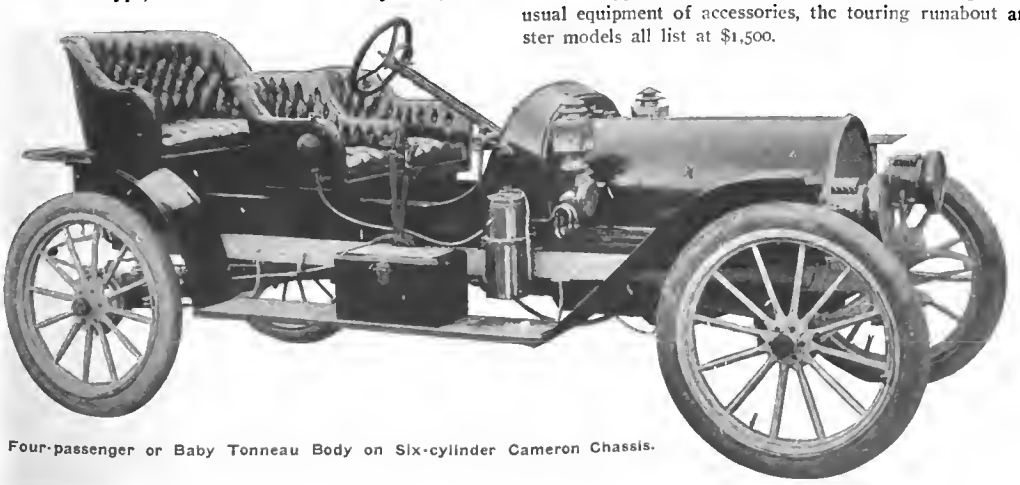


Cameron 30-36 H.P. Six-cylinder, Air-cooled Roadster.

FOR the coming season the chief representative of the Cameron air-cooled line of cars, made by the Cameron Car Company, Beverly, Mass., will be a machine of the six-cylinder type, which will be placed on the market at $1,500. As a matter of fact, this new Cameron, which is known as Model 11, is already on the market. The motor is of the well-known air-cooled type that this concern has been turning out for the past six years, and has undergone practically no changes in the 1909 model, with the exception of improvements here and there that are the result of experience. The six-cylinders are cast independently, the valves being placed opposite each other in the head, thus obtaining all the advantages of a direct placing in the head, and at the same time making a smooth chamber inside the cylinder, with the added benefit of permitting the cool air coming through the inlet to keep down the temperature of the exhaust, this valve arrangement being responsible for the great fuel economy of the Cameron motor.

The crankshaft is a one-piece drop-forging supported on four ample-sized bearings of Parsons' white bronze, the big end bearings of the connecting rod also being of the same metal, the bearings themselves being die cast. Both cylinders and pistons are cast from very hard, fine-grained gray iron, and this is also true of the piston rings. The wrist pins are unusually large and are ground to a perfect fit. The cylinder dimensions are 3 7-8-inch bore by 3 1-2-inch stroke, and the motor develops its rating of 30-36 horsepower at a moderate normal speed. A dual system of ignition is fitted, employing the Remey high-tension magneto, which is included in the list price. The clutch is of the internal conical type, self-contained in the flywheel, thus doing away with all end thrust. Drive is by means of a propeller shaft through a single universal joint to a unique type of selectively operated sliding gear-set giving three speeds and reverse. This is a special design of transmission that has been developed by the builders of the Cameron cars and is one of the strong features of their machines. It is built integral with the rear axle, the pinions and shafts being made from high-grade chrome nickel steel, supported on imported annular ball-bearings. The latter are also employed on both the front and rear wheels and in the rear axle driving unit, the only plain bearings being in the motor. The forward axle is a piece of seamless steel tubing, the knuckles, steering arms and connections all being substantial drop-forgings; the driving axle is of the floating type, the entire load being carried by the housing tube, while the driving shafts are of chrome nickel steel.

Two sets of brakes are combined in the same drum, mounted on the driving wheels, the service brake consisting of a thermoid-lined hand contracting on the drum, while the faces of the emergency brake are malleable iron against steel, the former constituting the shoe, which expands against the inner face of the steel drum. Full elliptic springs are used on the rear and three-quarter elliptics on the front, making the car very easy riding for its weight, which is but 1,650 pounds in the touring type. The steering gear is of the enclosed rack and pinion type. Wheelbase is 112 inches and the tread is standard, but the 60-inch southern tread will be provided on order. Tire equipment is 32 by 3 1-2 inch all round on all models. The touring car is capable of 50 miles an hour, and the runabout and roadster types of 60 miles. Complete with magneto and the usual equipment of accessories, the touring runabout and roadster models all list at $1,500.



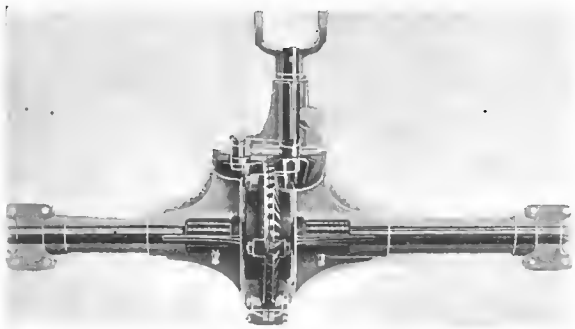
Four-passenger or Baby Tonneau Body on Six-cylinder Cameron Chassis.

Maxwell Model A, 10-Horsepower Junior Runabout.

MAXWELL JUNIOR RUNABOUT FOR 1909.

As a leader for its 1909 line, the Maxwell-Briscoe Motor Company is planning to build no less than 5,000 10-horsepower runabouts, which will be marketed at $500 each. The foregoing illustration of this new car, known as Model A, shows that it closely follows the lines of its predecessors in the Maxwell fold. and a review of its specifications makes this even more apparent. As a matter of fact, it is practically a replica of the 12-horsepower Maxwell that has been on the market for several years past and which lists at $825, the chief difference between the two cars lying in their size. The two-cylinder motor is of the horizontal opposed type, and its cylinder dimensions are 4 by 4 inches, its rating of 10-horsepower being delivered at 1,500 r.p.m. The valves are mechanically operated and the cams and camshaft, contained in a separate housing, are removable without disturbing the timing. The entire motor is protected by a sheet metal pan extending from the radiator to the dash.

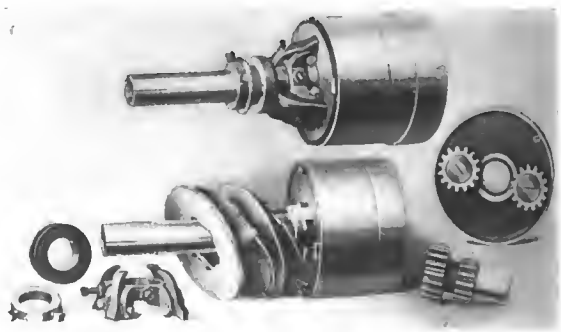
The carbureter is of the standard Maxwell, float-feed type.



A View of the Maxwell's Rear Axle and Connections.

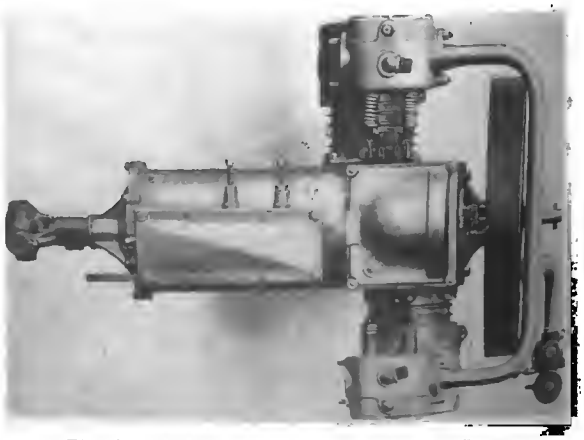
while ignition will be of the high-tension order, employing a double unit coil on the dash; a compression oiler located on the forward face of the dash under the hood, with three sight-glasses on the dash proper, will take care of the lubrication. For cooling, the thermo-syphon system used on the other Maxwell cars, is employed, with a honeycomb radiator. The same type of multiple disc clutch is also used, the gear-set being of the planetary type and providing two forward speeds and reverse, both the clutch and the gear-set running in a bath of oil. Final drive is by shaft to a live rear axle, there being two universals between the gear-set and bevel gear. The frame is of pressed steel, hot-riveted, while the running gear will consist of 28-inch wheels with 3-inch tires of the clincher pattern. The suspension consists of full elliptic springs, both front and rear. while the wheelbase is 82 inches, and the tread standard. The brakes are placed on the driving wheel hubs and are double-acting. A 10-gallon gasoline tank is provided, while the radiator holds 2 1-2 gallons of water, and the oiler one quart, or sufficient for 100 miles. The weight, all on, is 1,100 pounds. A metal body of the runabout type with a divided seat and an open deck in the rear provides accommodation for two.

In its preliminary announcement concerning the newcomer, the Maxwell-Briscoe Motor Company makes a very interesting comparison between the initial cost and the expense of maintaining a horse and buggy as compared with running a Maxwell Junior runabout for a year, conceding, of course, that any automobile would be used so little that its total mileage for a year would be but 1,000 miles, which is said to represent the average travel of the individually owned horse rig in this country. Rather a significant fact in this connection is the citation from the government statistics of the figures covering American carriage production, which show that very close to 1,000,000 carriages of all kinds are turned out by American makers annually. Of these, 770,000 in round numbers are of the one-horse buggy type, which may best be compared in first cost and expense with an automobile of the size of the Maxwell Junior. Figuring depreciation and interest at the same rate in each instance and charging the usual prices for supplies and repairs in the case of both the horse and wagon and the automobile, it is calculated that it costs the average horse owner $375 to cover 1,000 miles in the course of a year, at an average speed of eight miles an hour, which is high, as the usual horse-drawn vehicle seldom averages better than six miles an hour, even for comparatively short distances, while on a long run this would naturally be less.



Showing the Planetary Transmission Assembly.

On the other hand, the Maxwell Junior is capable of speeds ranging from four to 40 miles an hour, and in the hands of the average horse owner in the country would probably cover 1,000 miles every three months, due to its far greater range of travel, making convenient and easy visits that are practically out of the question with a buggy, owing to the distance. To cover 1,000 miles with the Maxwell the makers figure would cost $108, which could be spread over a year or not as the owner desired.



The 10-Horsepower Motor That Furnishes the Power.

Autoing's Limitations In Uruguay

By Sigmund Krausz

One so called road

One real road

Uruguayan farm houses

The old and the new

MONTEVIDEO, Uruguay, Sept. 1.—Upon unpacking my car in the customs house at Montevideo I found that one of the fenders had received large rust spots through some corroding liquid which had run over it. They said it was saltwater, but how in the world saltwater could have penetrated into the tight case is more than I can understand, for they pack well at the Dayton factory, as I had learned through actual experience at Havana and Rio de Janeiro. However, the damage was so well repaired by a native firm of coach builders that I can only pay them the highest compliment.

This matter was not the only thing, though, to ruffle my temper at the customs house. While I was not subjected to so much running from Pontius to Pilate, as in Rio de Janeiro, I was told, to my great surprise, that there was a duty on automobiles in Uruguay. I had been informed just to the contrary by the consul of that country in New York, whom I had interviewed shortly before shipping my car. True, the duty is not prohibitive, but it is always a disappointment to have to pay for something which you expected to get for nothing.

The worst thing, however, was to come, before I could clear my car entirely. There was a charge for lighterage against it, and this lighterage amounted to more than the whole freight charge from New York to Montevideo. While the latter was only slightly over $100, the robber barons of the lighter trust—for there are trusts down here as well as in the United States, although they operate under different names—demanded more than $125 for taking the car from the big steamer to the dock, and there was a charge of another $20 for hauling it under cover to the customs house.

I tried to protest, first mildly, then energetically, but to no purpose. The company would listen to no protestations; there was a fixed tariff, they said, and since the law gives them a lien on the goods until the charges are paid, there remained nothing but to "cough up," as they say at home.

After these gall-raising experiences, I was somewhat recompensed by finding an excellent up-to-date livery garage—by the way, the only one in Montevideo—where I was able to hire a closed stall, including cleaning of the car for a price which I do not care to mention, for fear it would bring the blush of shame on the cheeks of some of our garagemen in the United States. At the same place was an excellently equipped machine and repair shop, for which, however, I have so far never had any use, in spite of some considerably hard driving.

I wish to dwell a little on the fact that, whereas I had a lot of trouble and waste of time in Rio de Janeiro before I could get a license for car and driving, this matter was arranged here with slight effort, and, what is more, there were no fees and taxes connected with the procedure. In the Brazilian capital they had amounted to more than $60. But, then, they do not have to support such a lot of loafers here as one finds in the municipal offices there.

This garage, being the only one in town, as mentioned above, I had immediately a chance to get fairly well acquainted with the types prevailing in Montevideo, a city of about 300,000 inhabitants. They are French, French, and again French, with a slight sprinkling of English, German and American machines. The latter are nothing to be proud of, however, consisting of a few cheap vehicles. No wonder there is a prejudice against them when one sees them running next to such machines as Renaults, Panhards, Mercedes, etc. The Stoddard-Dayton was an eye-opener to the connoisseurs and laymen here with its first appearance on the street, and even the daily papers noticed the fact that there was "a new coon in town."

The majority of Montevidean cars are of the limousine type, though why this should be is a conundrum, since they have only two to three months of so-called winter here. During the rest of the year it is warm and hot. Just now it is the winter season, but aside from rainy days, there is nothing in the temperature to indicate this. There is no frost and the temperature does not range lower than 10 to 15 degrees above zero (celsius). It can, in my judgment, therefore, be only the characteristic hankering of the Latin-American race to "show off" which makes the limousine popular.

I don't expect that the auto sport will ever take deep root here, as there are no attractive drives within the city limits. The pavement of the streets, too, on which, by the way, you have to drive on the left, is not too seductive. It consists of

granite blocks, not badly laid, but still this is not the ideal pavement for motoring. Another thing which does not tend to make auto driving in the city enjoyable is the number of big heavy electric street cars which shoot past the crossings at an amazing rate of speed. Why they should be allowed such speed in narrow, rectangular streets is more than I can comprehend, when the limit for automobiles is to about seven miles within the city. The Prado, a small park, and the Parque Urbano are the only places where one can drive without having his nerves at high tension all the time. But there is not a mile of driving in the two parks together.

On the other hand Montevideo has a great advantage over Rio de Janeiro. It has at least some good macadamized country roads in its immediate vicinity. There are several of them in various directions, on some of which, I am told, one can get as far as 50 kilometers from town. I have tried several, for example, the ones leading to the Barra Santa Lucia, to Colon, and to Pando, a village of about 35 kilometers from the city.

The Barra Santa Lucia is a pretty river scene, which I could only admire from some distance, as the road at its end was torn up by repairmen and the heavy rains of the preceding two or three days had made the mud there knee-deep. Having several guests with me, among them ladies, I did not care to get "stuck," and gracefully yielded to the request of the latter not to go any further. The stopping place is pictured in one of the photographs accompanying this article.

The drive to Pando, however, proved more enjoyable, in spite of various adventures, and, it is of this I want to speak now. I had invited Mademoiselle Mathilde de Lerma, the celebrated Spanish prima donna, who is at present singing in Montevideo, and who wants to take a Stoddard-Dayton machine with her back to Spain, to enjoy a spin with me in the country, and there were several more in the party. We started from the Hotel Lanata, where we all stopped, and soon gained a fairly good country road a short distance from the city limits. It was a magnificent day, corresponding to our late October days, and the air was filled with ozone. Past avenues of eucalyptus trees, large cactus hedges, and American barbed-wire fencing we went at a moderate speed which allowed us to admire the undulating landscape, with its scattered adobe farm houses off the road, the numerous cattle grazing on the *estancias*, and here and there, the distant view of the La Plata river, which is here about 80 miles wide and looks certainly like the ocean.

From time to time we met heavy two-wheeled carts drawn by four or six oxen, or three horses harnessed abreast, on one of which the driver was riding. The wheels of these carts were not less than 6½ feet in diameter, and, although these vehicles are not heavy and do not carry great loads, the thick mud covering the hubs and spokes plainly indicated the reason why so many draft animals were attached to them. As a rule, the lanes and side roads of Uruguay are either a sea of mud or sand, and I would not advise any automobilist to leave the main roads around Montevideo for exploring purposes.

The majority of the animals we met were evidently not used to the sight of an automobile, and more than once they turned the carts into the shallow ditch beside the road, in spite of the efforts of their drivers and our own moderation of speed and noise. Frequently we stopped the motor altogether to allow the frightened beasts to pass. This we had to do specially when we met a *gaucho* on a young and refractory horse. These Uruguayan cowboys in their wide trousers and flowing *ponchos* are picturesque characters, and only their splendid horsemanship enabled some of them to keep the saddle while their mounts shied and reared at the puffing and whirring of the approaching auto. By stopping the car and allowing a horse-drawn vehicle to come out of a lane and up to the automobile I was able to take a picture showing the modern and ancient method of transportation in South America.

Once we met several oxen and cows crossing over the road. We approached slowly. Then, two or three of them stopped in the middle of the road turning their heads in our direction. As we came nearer one of the beasts faced the car, and, lowering its head, prepared to charge. The two ladies of the party uttered frightened shrieks, and I saw already in my mind a smashed radiator and an aching bull's head, when the chauffeur pressed the exhaust pedal and the sudden gunfire-like clamor frightened the animal so that it turned tail and jumped over the cactus hedge lining the road. A young calf, though, got so scared that it ran directly in front of the auto and only our slow gait, together with a quick turn of the steering wheel prevented a catastrophe.

"I am passionately fond of a *corrida*," remarked Senorita De Lerma, a minute later, "but I do not care to be myself the matador in an automobile. Perhaps we better turn back." But we had arrived within a mile or so from Pando, a picturesque village, and, all of us being rather hungry, it was decided to push on. We reached the *fonda* of the village a few minutes later, where the car was immediately surrounded by crowds of natives. It was Sunday, and, although the host of the inn could not possibly have figured on unexpected guests, we were soon served with a native dinner, consisting of *cossido* (boiled beef and pork, garnished with cabbage, potatoes, sweet *patates*, slices of pumpkin, and *garbanzos*) and cold *mulita*. The latter is a dish, the taste for which does not need much cultivation, if one can overcome the repugnance it causes at first to those who never have seen and tasted it before. *Mulita* is the native name of the armadillo of natural history, the little South American animal which carries its armor on its back and is thus protected against its enemies, except men, who close up its holes and then catch it running. The *mulita* is roasted in its iron-hard shell and served with it. It is the view of the animal lying on its back complete with head and tail that at first tends to turn the stomach of a *gringo*, but if once you have tasted its tender, juicy meat, which has the flavor of roast pork or goose, you are bound to like it.

After dinner we visited the little church and had some fun with the dark-skinned, black-eyed and pretty country girls, who innocently expressed their admiration for the new kind of vehicle. Some of them indicated that they would like to have a ride, and we packed a load into the car, taking them around the plaza. This did not prove a good policy, for the whole crowd now clamored for a turn around the square, and, to escape their importunities, we had to start on our way back.

We reached Montevideo after several more incidents similar to those related further above, and with slightly different experiences from those gained on American country roads.

MARYLAND MAY GRANT RECIPROCITY.

BALTIMORE, Md., Oct. 5.—Numerous suggestions for controlling autos in this State were brought out at the conference of the Maryland Automobile Commission with Governor Crothers. One of the principal subjects discussed was that in reference to licenses of owners from other States who bring their cars into Maryland. Col. Sherlock Swann argued that it was unfair to make an automobile owner from outside of Maryland who came into this State with his machine for a few days pay as much for a license as the man who has the use of the State roads the entire year. All the members of the commission and the Governor agreed on this matter.

Walter B. Brooks then recommended that a 20-day period could be granted to outsiders with automobiles for their stay in Maryland without a license, and the commission decided to make this recommendation. The commission also recommended the alloting of licenses so that a man who took a license out in September of the current year would not have to pay as much as the man who waits until January to procure a license.

The placing of signboards throughout the State was also advocated. On the question of taxing autos Governor Corthers said he wanted to tax machines up to the neck, but not so high as to impose a hardship upon the owners. The Governor declared all revenues should be used in the interest of good roads.

NEWS FROM SOME ACTIVE CLUB CENTERS

BUFFALO CLUB DOING MUCH GOOD WORK.

BUFFALO, Oct. 12.—The Automobile Club of Buffalo still continues to grow in a way which will keep the rival clubs on the jump to equal its membership. When September ended the rolls showed 1,390 names on the list with 37 more waiting to be acted upon. The most notable achievment of the club as recorded for September was the final completion of arrangements with the Canadian authorities whereby any member of the Automobile Club of Buffalo may enter Canada, at any point on the Niagara Frontier, on presentation of his membership ticket, free of any bond. The customs official will make out a duplicate card and hand one to the tourist, good for a three days' stay in Canada.

The club committee on road signs has continued its good work, and the route to Lockport and Niagara Falls, via Pekin, has been re-marked, and danger signs placed where required. The new signs for the road between Fredonia and Jamestown, via Cassadaga, have arrived and will be erected before the middle of the month. The club has been troubled in their work of placing road signs by people who have maliciously torn them down or defaced them, and has made a standing offer of $50 reward for information leading to the arrest of such persons.

WHAT ONE CONNECTICUT CLUB IS DOING.

HARTFORD, CONN., Oct. 12.—The recently organized Automobile Club of Willimantic is a live body, as is evident from the activities of the club of late. For instance, an effective sign-posting campaign has been inaugurated, and the good and bad spots will be indicated as the case may be. A special meeting of the club was held recently and action was taken regarding the betterment of the city streets. A club run is slated for the near future, and also a game dinner at some favorite resort to be decided later. It was voted to purchase a score of A. A. A. radiator emblems, which will be placed on the cars of members as soon as received. A strenuous season is anticipated, and, as Secretary Lincoln expresses it, "in the spring we are going to try to do some other good things which will attract attention.

MINNEAPOLIS CLUB WILL BUILD A HILL.

MINNEAPOLIS, Oct. 5.—Members of the Minneapolis Automobile Club are all enthused over the proposed plan to erect, to order, a permanent hill on the club property at Bloomington, for hill climbing contests. The plan has been talked for a couple of weeks, and the proposition of financing the deal will be taken up before the directors of the club at the next meeting.

As planned the hill would be half a mile long and having a grade varying from 10 to 24 per cent. The course would be laid out along the Minnesota Bottoms directly in front of the clubhouse, so that the races could be watched from start to finish from the porches of the clubhouse or from grandstands to be erected on the spacious lawns. It is thought sandstone block will be used to assure permanency of construction and identical conditions year after year.

The building of a hill "to order," so to speak, has not been done, it is believed, by any other club in America, and the members of the Minneapolis Club are all anxious that the honor of being first should fall to this club. Consequently, with all this interest it is very likely that on Saturday, July 3 next, the hill will be the scene of a contest which will attract national attention.

Chairman J. deM. Thompson of A. A. A. Racing Board and Vanderbilt Cup Commission at Chateau des Beaux Arts, Huntington, L. I.

A. C. A. PROVIDES FOR NEW MEMBERSHIP.

NEW YORK, Oct. 12.—Two new classes of membership have been established by the board of governors of the Automobile Club of America. First the bars were let down to women, and second, a clubroom membership was established. Women have formerly only been allowed in the ladies' rooms under the stairs. By the action they are to have all the privileges of ordinary members, except that they cannot vote or hold office, nor may they use the restaurant and assembly room. Hopes are held out that the proposed extension of the clubhouse over the recently purchased property on Fifty-fifth street will provide them with better facilities later.

The clubroom membership is limited to 100 and can be secured for $25 a year without payment of any initiation fee.

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FIRST OF THE MOTORWAYS IS OPENED.

An epoch in motor-driven land transportation is marked by the opening of the Long Island Motor Parkway, a race course only incidentally and not constructed exclusively for high speed competition, as is the generally erroneous impression. First of many motorways for the use of automobiles is the Long Island road, and therein William K. Vanderbilt, Jr., has placed to his credit something which logically should come from a family whose members for three generations have figured in the history of transportation. If man is to get the full worth of the latest form of individual transport, he must supply a road whereon he can take advantage of its time-saving possibilities. All other arteries of travel must be avoided, including the highway on which the horse will continue for a longer period to plod its weary way; the dangers of railroad crossings at grade must be obliterated and the rights of the pedestrian cannot be overlooked, for while many will use the automobile, a still greater number may never be so fortunate. 'Tis a clear and open road that the automobile requires, and, given such, man will enjoy and employ his new means of progress to its fullest reasonable extent; not a few will go beyond the limits of prudence—and, frequently, pay the penalty.

When its plans are entirely consummated, the Long Island motorway will supply an uninterrupted route across the island which, owing to its proximity to the metropolis, its destined to be the home of millions with business and social interests in New York City. Some day the State will supply such motorways—for the ultimate form of all highway traffic is certain to be of the motor-propelled sort—but until that time arrives the owner of the automobile will not object to paying for the boon of an "open road" that is such in reality. The assured enormous population of Long Island is a guarantee of the ultimate financial success of its motorway, but those who have made it possible are not counting upon any substantial immediate return from their investment.

When automobiling will have attained some years to its being, and the events of its past will necessitate the telling so that the new generation can inform itself of that which is history, the chapter on the first of the motorways will make known to what great degree one William K. Vanderbilt, Junior, first prominent because of a racing cup bearing his name, added more permanently to his outoing fame by being the moving and responsible factor in the building of the first road in the world for the daily use of the automobile, which undertaking created an example that was soon followed by many such highways throughout the country, thereby aiding materialy in the growth of a great industry which carried with it far reaching effects.

* * *

PRESENT STATUS OF CLUTCH DESIGN.

Doubtless the weakest part of the design of early cars was to be found in the clutch, and many constructors instead of attempting to overcome the defects of the then standard type, the leather-faced cone, cast about for something entirely different. The result has been the development of a number of types, all of which appear to have proven equally successful when properly designed and constructed for the work to be done, the lack of which summed up the defects of early attempts. Time has shown that it was not the principle so much as the manner of its application.

Despite the predictions of those who found its use a difficult matter of practice in earlier years, the plain conical type has not been superseded by something of later growth, but is as much in evidence on high-priced cars today as it ever has been. It combines the manifest advantages of simplicity, light weight, low initial cost, and ease of repair, and while improvements in design have done much to perpetuate it, the adoption of cork as a friction material, either directly on the metal, or as a supplement to the usual leather facing, has been a factor of great importance in its retention. The multiple disc clutch, which is probably favored by a greater number of designers than any one other type, with the exception of the cone, represents a close approach to the ideal, for all designers are seeking a clutch that may be slipped under heavy loads without damage to itself, besides which it has the great advantage of a low inertia factor, not to mention its extreme compactness and the fact that it is self-contained and generously lubricated. Aside from these two types, which appear to be about equally favored, there are several modifications of band clutches which have been developed to a high degree of efficiency and reliability, and it is worthy of remark that the use of cork has influenced the development of these types, as well as of the disc clutch, where the number of plates employed is comparatively small.

A. A. A. IN QUARTERLY SESSION TAKES IMPORTANT ACTION

IF present plans materialize, and the American manufacturers of commercial vehicles come forward with a plenteous entry, there will be a notable first contest next Spring for the Powell Evans $2,000 trophy for commercial vehicles. This trophy, donated by Mr. Evans, who is president of the Automobile Club of Philadelphia, was formally accepted at the quarterly meeting of tbe Board of Directors of the American Automobile Association, beld in New York City, Friday, October 9, with First Vice-President Lewis R. Speare, of Boston, presiding, in the absence of President William H. Hotchkiss, of Buffalo, who was unable to attend.

For the greater convenience of the association's membership at large, it was decided that the offices of the Touring Board should be removed to New York City in the near future and its work carried on from the general headquarters of the organization, at 437 Fifth avenue. Powell Evans was named as chairman of wbat hereafter will be known as the Touring, Information, and Maps Board, and Frank B. Hower, president of the Automobile Club of Buffalo, who has been chairman of the Touring Board, will become chairman of the Contests Board, which will succeed the Technical Board, and have charge of all contests other than racing and speed events, same to include all touring, technical, endurance and economy contests, as well as hill climbs.

The Racing Board, as heretofore, will continue in charge of speed contests.

Various recommendations of President Hotchkiss were adopted, including an enlargement of the national board of directors, so that every club throughout the country will have a member on the board.

R. D. Inman, of Portland, Ore., was elected a director to represent the Portland Automoble Club. A long list of individual members was also passed upon, and action was taken providing that any individual member whose application is filed after this date will be extended membership privileges covering the fiscal year ending December 1, 1909.

President Hotchkiss was authorized to appoint a committee of five to represent the A. A. A. on the National Conservation Commission, at the suggestion of Gifford Pinchot, chairman of this government body.

The Executive Committee having previously referred to President Hotchkiss and Secretary Elliott the solution of the California situation, their recommendation was that provision be made for two State bodies in a commonwealth of such great geographical extent, and this plan was adopted.

The advisability of issuing a monthly or quarterly bulletin will come up for consideration at the next meeting.

The offer of the Show Committee of the American Motor Car Manufacturers' Association to allot space to the A. A. A. at the Grand Central Palace exhibition in New York City, was accepted. It was also decided to hold a general meeting of the association at the time of this show and again during the Madison Square Garden show in January. Application will be made to the Trunk Line Association for reduced railroad rates during the weeks of these shows. Adjournment was to October 23.

TWENTY AND PERHAPS MORE FOR THE VANDERBILT CUP

AS the entry list for the Vanderbilt Cup race, which is to be beld on the Long Island Motor Parkway course on the 24th, now stands, there are twenty entries in all, representing America, Germany, France and Italy, and there appears to be good reason to believe that there may be further entries in the fortnight still intervening. Of the total number now in hand, tbirteen are American cars, consisting of three Thomas cars, two Locomobiles, two Knox representatives, two Mathesons, and one each of the Chadwick, Acme, Mora and B. L. M. makes. Tbe seven foreign cars are the three Mercedes, a Brasier, an Isotta, a Hotchkiss and a Renault.

Up to the present, all but six of the drivers have been selected. Salzman will pilot one of the Thomas cars, the other two still being without drivers, while Robertson is to have charge of a Locomobile, but his running mate for the other car of the same make is still to be chosen. The Knox entries will be handled by Basle and Bourque, and the two Mathesons will have as pilots, Chevrolet of former track fame, and J. B. Ryall. There is no driver as yet for the Mora. Willie Haupt will handle the Great Chadwick "six," while Strang has been nominated for the Renault and Patsche is to pilot the Acme entry. Of the Mercedes team, two are to be handled by professionals. W. K. Vanderbilt, Jr.'s car being piloted by Luttgen, while Stricker will have the Graves entry. Foxhall Keene will drive his own car as usual.

It is rumored that Montague Roberts will be put at the wheel of one of the added Thomas cars. Kilpatrick seems a likely pilot for the Hotchkiss, in view of the fact that he has been identified with the efforts of that make this season in straightaway and 24-hour contests. Although no announcement of the final choice of driver for the second Locomobile, Jim Florida was given a try-out in the Philadelphia race of last Saturday.

Joseph Tracy has concluded a contract with C. W. Matheson to look after the Matheson camp. Tracy will pitch the Matheson camp at Gifford's. Stricker was formerly a demonstrator for the late Alexander Fisher, of New York, when he was the importer of the Rochet-Schneider. Strang gives Stricker's instructions credit for most of his success as a driver.

Lytle's high average of 64 miles an hour, made in the Isotta last Saturday, has shown what can be done over the new course, and much in the way of record-breaking is to be expected of the Vanderbilt race. Lytle's performance has also created a strong speed craze among autoists generally, and the demand for permission to use the Parkway stretch has been so great that it has been thrown open from 8 A. M. to 6 P. M. daily, the fee being $2 for that time, but no night driving will be permitted until after the Vanderbilt. Motorcycle riders who have had an opportunity to try the course are anxious to have a big motorcycle event.

In the Vanderbilt race itself, six of the American cars will carry Diamond tire equipment, and to add further zest to the race, the Diamond Rubber Company has offered $1,000 in prizes for winning cars shod with its tires. This sum is divided into a first prize of $500, the second, third and fourth to finish receiving $250, $150 and $100 respectively. The tires will be mounted on Diamond demountable rims and will be inflated ready for use.

The entry list and drivers as complete up to October 12 are given out as follows:

Car.	Country.	Entrant.	Driver.
Acme	America	Cordner & Flinn	Patschke
B.L.M.	America	Thos. Williams	Williams
Chadwick	America	Chadwick Eng'g Wks.	Haupt
Knox	America	Knox Auto Co.	Basle
Knox	America	Knox Auto Co.	Bourque
Locomobile	America	Locomobile Co.	Roberteon
Locomobile	America	Locomobile Co.	———
Matheson	America	Matheson Co.	Chevrolet
Matheson	America	Matheson Co.	Ryall
Mora	America	Mora Co.	———
Thomas	America	E. R. Thomas Co.	Salzmann
Thomas	America	E. R. Thomas Co.	———
Thomas	America	E. R. Thomae Co.	———
Brasier	France	H. Payne Whitney	———
Hotchkiss	France	Hotchkiss Import Co.	———
Isotta	Italy	C. V. Brokaw	Lytle
Mercedes	Germany	W. K. Vanderbilt, Jr.	Luttgen
Mercedes	Germany	Robert Graves	Stricker
Mercedes	Germany	Foxhall Keene	Keene
Renault	France	Paul Lacroix	Strang

HOW A NEW JERSEY COUNTY GAVE AN AUTOING LESSON

MADISON, N. J., Oct. 10.—New Jersey automobilists turned out in great numbers for the big automobile tour "Around the World" in Morris County, Saturday, and despite the threatening weather the affair was a success. It is estimated that $3,000 was realized from the sale of tickets, fancy articles, etc., which amount would certainly have been doubled but for the cold, threatening weather during the afternoon, and the rain that brought things to a stop fully two hours earlier at night.

The tour was arranged for the benefit of the Y. M. C. A. of Morristown and Madison and the Girls' Club and Boys' Brigade of Chatham. Each passenger was charged $1 for the entire tour of fifteen miles, which included stop-over privileges at the different stations. These included the beautiful estate of James M. Gifford at Chatham, which was decorated as Peking, China; the home of C. F. Wheeler in Main Street, Chatham, representing Washington; the home of James H. McGraw, Prospect Street, Madison, which was attired to represent Madrid; the home of C. M. Decker at Convent, which represented Yokohama, Japan; F. C. Blanchard's large estate in the Woodland Road, near Chatham, which was decorated to represent Berlin, and L. B. Tompkins' home at Morristown, which place represented Constantinople, Turkey. Each of these places was gorgeously decorated in the native colors they represented, and were all the more attractive by the costumes of those in charge of the various booths. Aside from the different stations as above described, the tourists were given an opportunity of shopping at the Y. M. C. A. buildings at Madison and Morristown. Among the many attractions at the latter place were the two Arabian horses of Homer Davenport, which were on exhibition at the Tompkins estate. The route of the tour carried the sightseer past the historic Washington headquarters in Washington Avenue, Morristown, one of the chief objects of interest.

The affair was arranged by a group of prominent residents of the three New Jersey towns, who were organized as the International Touring Company. These included James H. McGraw, president; Willard W. Cutler, Thomas W. Cauldwell, Homer Davenport, Alfred Evans, James A. Webb, H. S. Heitkamp, and Charles M. Lum, vice-presidents; Edward P. Holden, Jr., secretary; Edward D. Conklin, treasurer; Herbert Strong, general manager; W. Reginald Baker, superintendent; A. B. Leuder and H. B. Stopford, division superintendents; Melvin Jackson, general ticket agent; H. D. Ogden, general passenger agent; Emory N. Faulks, general freight agent; Carrol B. Merritt, general advertising manager; Theodore B. Morris, general publicity agent; F. A. Trowbridge, master mechanic, and W. F. Day, Jr., courier-in-chief.

Aside from it being a huge charitable entertainment, the affair was a gigantic automobile carnival as well, and the society folk of Morris County were out in force. Never before was there such a large procession of automobiles assembled in that section, and the beautiful macadam roads connecting the three towns resembled a Vanderbilt Cup course. More than one hundred machines were loaned for the day, and these were kept on the go from 2 o'clock in the afternoon until 7 o'clock at night, when it began to rain. Many of the nearby residents kept their cars in service until late in the evening, and the tourists were given an opportunity of reaching their respective starting points. There was much congestion during the afternoon, and many more cars could have been pressed into service, but the crowd was very well taken care of.

Not a single accident marred the event in any way, and it was voted a grand success. Aside from this, it demonstrated the true merits of the modern automobile, and will be the means, no doubt, of relieving much prejudice that has heretofore existed. The people of Morris county, hundreds of whom took advantage of the fifteen-mile run, were shown the need of better legislation. As an example, a large percentage of the residents of the towns in that fashionable section are devoted to their horses and use the roads extensively, and the immense number of automobiles traveling along the fifteen-mile course was the means of demonstrating the necessity of lights on all vehicles, while the roads themselves need more lights.

ONE THOUSAND AUTOMOBILES IN LINE.

Probably one of the most notable features of the Deep Waterways convention in Chicago last week was the outing given the 5,000 delegates in automobiles supplied by Chicago owners for use of the Association of Commerce. When the 1,000 machines were lined up they extended over six miles of pavements, representing a total valuation of over $3,000,000.

HARTFORD AUTOISTS HELP OPEN A CONNECTICUT BRIDGE

HARTFORD, CONN., Oct. 11.—There has just been successfully concluded a three days' celebration of the formal dedication of the new stone bridge across the Connecticut River. The structure is said to be one of the finest stone bridges in the world. In connection with the celebration there was an industrial procession. The Hartford Rubber Works Company, the Electric Vehicle Company, the Pope Manufacturing Company, the Whitney Manufacturing Company—in fact, all concerns identified in one way or another through their product with the automobile industry—were represented. Of the good accomplished by the demonstration there is not the slightest doubt. As celebrations go, it was typically New England. The automobile parade in the evening was a gorgeous affair.

Cars and commercial vehicles were gorgeous in their embellishment. One that is particularly deserving of mention is a light electric truck used by a local Swedish society, by means of which was shown a model of a Viking ship, and so gracefully did the mimic craft spin over the ground that the mode of propulsion remained a mystery to the uninitiated. Of the commercial vehicle section proper, the Hartford Rubber Works had a very unique float. The big electric truck of the company was decorated in keeping with the event, and the sides bore mammoth trade-marks in electric lights in the form of winged tires. The Pope Manufacturing Company was present with the big Waverly electric truck, on which was carried a 1909 model. The Electric Vehicle Company used the Riker electric truck, above which was an illuminated electric sign, and two old-time models were carried. The touring and runabout section was notable for many reasons. The seasons of the year were portrayed by various cars and decorated accordingly. President W. F. Fuller, of the Automobile Club of Hartford, was marshal of the procession in the Pierce-Arrow "six."

In all, about 600 cars participated, about three times as many as had been expected, and 50 motorcycles. So long was the procession that long after the start of it had reached the center of the city the finish had not passed that point to the turn, about three miles distant.

The Automobile Club of Hartford after the parade entertained the visiting autoists at the Allyn House. During the smoker there was formulated the Aero Club of Hartford, of which H. P. Maxim was chosen president, C. H. Gillette secretary, and F. W. Dart treasurer. Charles F. Glidden was the guest of the Automobile Club of Hartford, and the formation of the Aero Club is practically due to his visit.

FIRST SPACE ALLOTMENT OF A. M. C. M. A. SHOW.

Last week the American Motor Car Manufacturers' Association held a three days' session for the purpose of allotting space for the "Great White Auto Show" which opens on New Year's Eve. Because of the large demand for space—more than 70 different American and foreign makers applying to be assigned floor room, besides the accessory manufacturers—those in charge found that they would not be able to give each exhibitor the amount first thought possible, a reduction of 30 per cent. being necessary for vehicle makers while the producers of parts were taken care of as expected. The following were among those lucky enough to draw space in the court of honor:

Reo, Stoddard-Dayton, Mitchell, Ford, Maxwell, Premier, Mercedes and Panhard. The other cars assigned spaces included the DeDion, Delahaye, Clement, DeDietrich, DeLaunay, Fiat, C. G. V., Isotta, Renault, Lancia, Hotchkiss, Jackson, National, Overland, Marion, Mora, Atlas, Buckeye, DeLuxe, Pennsylvania, American, Brush, Marmon, Simplex, Motorcar, Gacth, Gearless, Kiblinger, Holsman, Welch, Abendroth, Moline, St. Louis, Austin, Moon, Chadwick, York, Oakland, Midland, Acme, Regal, Coates, Anderson, Benner, McCue, Wayne Works, Middleby, Speedwell, Lanc, Kissell, Schacht, Omar, Claude E. Cox, Gyroscope, Page, Cameron, Sultan and Cleveland.

Among the commercial vehicles are Rapid, Grabowsky, Abendroth, Mack, Bristol, Lansden, Hart-Kraft, Gram-Logan, American Truck, Pittsburg, Reliance, and DeDion.

CARTERCAR BUILDERS EXPAND GREATLY.

DETROIT, Oct. 12.—The Motorcar Company, builders of the friction driven Cartercar, has filed papers for an increase in the capitalization of the concern to $350,000, as well as for a change of title, the corporation being known in future as the Cartercar Company. The large plant of the Pontiac Spring & Wagon Works, Pontiac, Mich., has been acquired, and the work of transferring the machinery and stock now in the old Motorcar company's factory, at Twenty-first and Baker streets, Detroit, will be undertaken at once, and it is expected that the new plant will be working full blast on the 1909 product within 30 days. The new plant is excellently situated, being located at the junction of the Detroit, Grand Haven & Milwaukee and the Michigan Airline railroads. The buildings are brick and concrete, five stories high, and cover about two acres of ground.

The leading Cartercar model for 1909 will be of the runabout type, and is designed to list at $1,000; it will be known as Model K, and its specifications are such that there is little doubt of its popularity during the coming season. The Model G roadster will be continued for another season, with a few improvements here and there, while an entirely new touring car, known as Model H, will be put out to succeed this year's Model A. The Cartercar Company will also continue to build the Pontiac, which is a high-wheeler listing at $675.

IMPORTS SHOW INCREASE FOR AUGUST.

During the month of August the foreign manufacturers seem to have done an increasing business in this country as shown by the Government reports for that month. In the month of August, 1907, only 69 machines valued at $229,704 were imported, while for the same month, this year, 179 cars with a valuation of $280,970 were shipped here. These figures show that the price per car was a great deal lower this year than last, being about half, which is probably due to the fact that some of the smaller foreign chassis is becoming more popular in this country and also the fact that a large number of the taxicab chassis come from France.

Houston, Tex.—The Southern Motor Car Company has purchased the lease, machinery, tools, garage and good-will of the Empire State Motor Company, and in the future will be located in the former garage of that concern at Texas avenue and Caroline street.

PACKARD LOSES BIANCHI IN JERSEY DAWN.

If the man responsible for the New Jersey auto law, one Frelinghuysen by name, was really in earnest in his endeavor to prevent speeding by its misguided provisions, he must have had a powerful bad dream in the wee sma' hours of Sunday last, for the peace of that Sabbath morn in Jersey was rent by two automobiles keeping as far above the legal speed limit as their motors and their drivers' nerve would let them. They were a Bianchi and a Packard, at least that is the order in which they got away, the former crossing the imaginary line near West End station, a part of Long Branch, at 5:52 A. M., the Packard leaving five minutes later. When they came in the order was reversed, the Packard leading the way by a considerably greater margin than favored it at the start. Henry Weisel and M. R. Rothschild, two New York brokers, were the offenders, and the run-off was the result of many wagers as to the ability of the cars. Mr. Rothschild drove his Packard, while the Bianchi was entrusted to a chauffeur, and none of the essentials of a first-class event, such as timers, starter and referees, was missing. The course was 60 miles through a number of Jersey's seashore villages, the distance being covered by the Packard in 1:10:30,1-5, despite the drizzle.

ONE MAKER'S HUNTING TRIP.

Henry Ford recently took a ten-day hunting trip, the greater part of his traveling being done in a Model T Ford car. As the first of these cars happened to be ready about the time Mr. Ford wished to start on his trip he found it very convenient to give one of them this extra trying out in Northern Wisconsin. The trip was made via Chicago to Milwaukee, and to Iron Mountain, where several days were spent, then back again to Detroit, a total of 1,357 miles as shown by the speedometer. During the whole trip the magneto alone was depended upon, as no battery was taken at all. The following record of gasoline and oil consumption for the trip is rather interesting:

From	To	Miles.	Gasoline.	Oil.
Detroit	Chicago	345	15	5
Chicago	Milwaukee	118	6 1-2	1-2
Milwaukee		30	1 1-2	1-2
Milwaukee	Iron Mountain	285	14	3
Iron Mountain		25	1	1-2
Iron Mountain	Milwaukee	292	17	1
Milwaukee	Grand Haven	Boat	..	..
Grand Haven	Detroit	262	13	1
		1357	67	11 1-2

The average for trip was 20 miles per gallon of gasoline and 85 miles per gallon of oil. From this table it can be figured that the cost per mile per passenger was a little over ⅛ of a cent and if depreciation, etc., is added, less than ⅜ of a cent per mile per passenger.

Mr. and Mrs. Clarence Mackay, Who Are Renault Users.

Original Winton That Was Shown in Philadelphia Parade.

ORIGINAL WINTON IN QUAKER CITY PARADE.

In the industrial parade during Founders' Week at Philadelphia, October 7, one of the floats carried what is claimed to be the first gasoline automobile made and sold in America. This is a single-cylinder Winton phaeton, bought by Robert Allison, of Port Carbon, Pa., on April 1, 1898. For several years the car has been in the museum at the Winton factory. It appeared in exactly the same condition as when Mr. Allison drove it last; the old single-tube tires are rather the worse for wear, but the mechanism is still in working order. In fact, before the car was shipped, Mr. Winton started the motor and drove it around the factory yard.

MINNEAPOLIS TO HAVE AN AUTO ROW.

MINNEAPOLIS, MINN., Oct. 12.—Recent developments among the local agencies indicate that Minneapolis will have a "Motor Row" worthy of the name. Five of the large companies have closed deals involving heavy investments for sites and elaborate buildings on Hennepin avenue, the main thoroughfare of the downtown district, and building operations have been started. The five concerns thus far in the movement are the Stoddard-Dayton; the Minnesota Motor Sales Company, handling the "E-M-F," Studebaker, and Babcock electrics; the Maxwell-Briscoe combination; the Pence Auto Company, handling the Stevens and Buick; and the local branch of the Winton Motor Carriage Company. These are among the largest agencies in the Twin Cities, and such a general movement to a new locality carries weight.

The Stoddard-Dayton location, next to the corner of Hennepin avenue and Ninth street, is regarded as an ideal one. Its new garage building, to cost about $20,000, has been started.

Across the street will be the Minnesota Motor Sales Company's location, and here also a very showy and complete building will be erected to cost about $20,000.

The Pence Auto Company have acquired a site formerly owned by the Mutual Life Insurance Company, where the foundation was put in several years ago for a 21-story building. This project was abandoned, however, so in taking over the site the Pence Company gets a good start on its new six-story building.

The local branch of the Winton Company is having a garage and sales building erected on North Eighth street within a short distance of Hennepin avenue. This building will be so constructed that additional stories may be added in the future.

The Maxwell-Briscoe Company has also located in this same vicinity and plans are being drawn up for a $20,000 building, which will also be used as the Northwestern distributing plant.

Many dealers in accessories and other auto dealers have watched the progress of events, and there are several deals now on foot leading to the location in this neighborhood.

CHANGING THE DARRACQ TAXICAB.

PARIS, Oct. 1.—Several modifications have been made in the Darracq taxicabs familiar to New Yorkers by reason of their exclusive use by the New York Taxicab Company. The gilled tube radiator across the fore end of the frame has been abolished in favor of a dashboard radiator with thermo-syphon water circulation. The bonnet takes the form that up to the present has been almost exclusively associated with Renault cars.

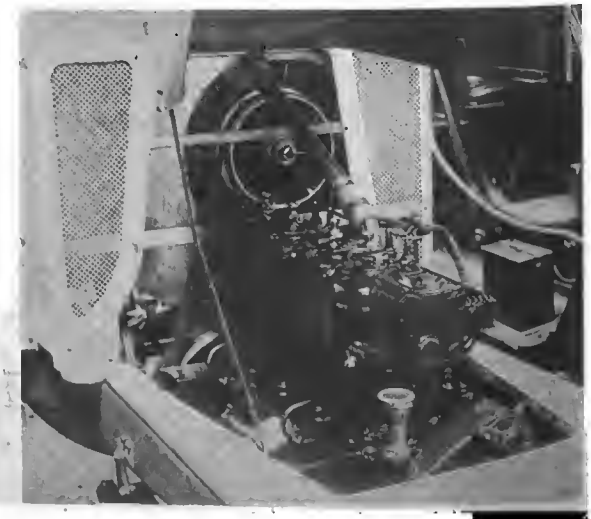
The new radiator consists of a series of circular plain copper tubes, there being twelve tubes in each circle and four or five circles. On the dashboard, and in the center of the inner circle of tubes is a flat blade ventilator driven by a belt direct from the flywheel at one-third increase on the engine speed. The dashboard space left free on each side of the rear of the bonnet does not allow a view of the radiator, as on most dashboard-radiator cars, this being enclosed by sheet metal super-imposed by a perforated plate, the object of the enclosure at this point, of course, being to increase the draught of the fan. The passage of the steering column through the dashboard has not allowed the radiator to be mounted in a central position, but slightly to the left. As no tubes are visible owing to the front covering plate, this peculiarity does not in any way mar the appearance of the car.

Advantage has been taken in the change of cooling arrangements to improve on the lubrication of the engine. On the 1907 taxicabs the flow of oil from the dashboard lubricator was assured by pressure from the exhaust, a system which possessed more simplicity than efficiency. On the new models the Lefebvre lubricator is of the force feed type, being direct driven off the ventilator shaft; the one belt operates fan and lubricator.

There has inevitably been a slight modification of the engine by the abolition of the water pump, but this is really the limit of the changes on the power plant. Transmission and final drive also remain as before, but suspension has been changed, the transverse rear spring being abolished in favor of three-quarter elliptics, a type of suspension which is being more and more generally adopted by European constructors. There has been a strengthening of the steering gear and modifications on the connecting bar to allow of taking up play with greater facility, thus assuring the parallelism of the wheels.

A series of three hundred of the improved models are about to leave the Darracq factory for service in New York and other American cities.

Atlanta, Ga.—Within the next few weeks the new garage being built for the White Company will be ready for occupancy. Their representative, E. W. Gans, will make this the distributing point for the Southern States.



New Thermo-Syphon Radiator Used on Darracq

ONE STORY OF A CLEVELAND RACE MEET.

LEVELAND, Oct. 13.—Dashing and tearing around the track, ling like an alarm of musketry, flying around dangerous ves, yet always holding true to the track, roaring monsters iron and steel, emitting flashes of flame and smoke, kept tators and officials keyed up to a highly nervous strain for days last week.

Vomen shrieked and all but fainted as the daredevil drivers ed life and limb in their mad efforts to be first at the tape! ng men grew sick at heart as the powerful machines seemed med to destruction, and laughed with relief when the cars ped as by a miracle. The whole crowd swayed with the rs as they tore around the turns and held their breath when car or the other gained a slight advantage. Never had such derful work been witnessed upon a race track! All the ers were striving to do their best (?), each wishing to cleave himself a niche in the hall of fame. And what roars went when first one and then the other won during the heartling two days. Oldfield, Christie, Kelsey, and Soules are es that will live forever in the hearts of Cleveland motorists!

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his was received in THE AUTOMOBILE's mail early Monmorning, and upon wiring our Cleveland correspondent to out what it was all about, it was discovered that the "Nal Circuit Meet" was held in that city last week. No records broken, as the track was not fast on either day.]

NCH AUTOISTS ANNOUNCE SAILING DATES.

RIS, Oct. 8.—Passage has been secured for the French teams g part in the Grand Prix of the A. C. A., at Savannah, on teamship *La Lorraine*, leaving Havre Saturday, October 24. drivers will consist of Szisz, of the Renault team; Duray, ie Dietrich firm, and Rigal and Hautvast, the two Bayardent drivers. Each driver will have his own mechanic, and or two helpers will be taken over. Six racing cars will be ed on the same boat, the Renault firm sending two and rd-Clement three, though racing one and two, respectively. tober 14, Victor Breyer, the European representative of the ican Automobile Association and manager of the first e Grand Prix, will sail from Cherbourg in order to attend anderbilt Cup race and the Savannah event.

is declared by Henry Fournier that two Italas will be ed in the Savannah Grand Prix, one of which will be hanby himself, and the other by Cagno. In the Bologna race ly, Fournier proved himself one of the fastest drivers, and or missing the turn might have been very near the winner.

. KELSEY IN DIFFICULTY WITH HAYNES CO.

VELAND, Oct. 13.—After having made a good showing in ack races here on Friday, and while he was tuning up his at night preparatory to doing still better work the follow-y, Robert G. Kelsey, of New York, the well-known driver, aken into custody by the Cleveland police, charged with a fugitive from justice, the arrest being made by request Chicago police. The warrant was sworn out by the s Automobile Company.

ey will say little, but he is mad clear through, and inhat the Haynes people are taking into the criminal courts which belongs under civil jurisdiction. All day Saturday sts of this city who know Kelsey offered to bail him out, der the charge bail cannot be accepted. Kelsey says he ake things warm for somebody.

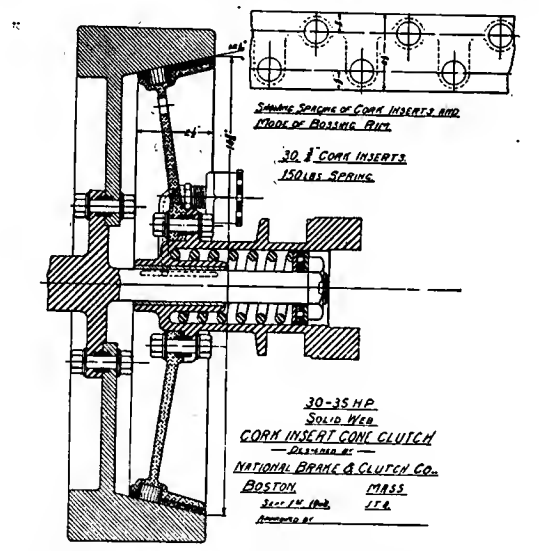
TERNATIONAL ROAD CONGRESS OPENS.

s, Oct. 12.—M. Barthou, the French Minister of public officially welcomed the delegates to the first International Roads Congress, which was formally opened to-day. The es represent 24 different countries.

DRAWINGS OF CORK INSERT CLUTCHES.

Editor THE AUTOMOBILE:

As the demand for cork insert clutches is constantly increasing and as the designers of these clutches have not always the necessary data to bring the best results, our engineer has prepared plans of three clutches of 20-24, 30-35 and 45-50-horsepower, respectively, embodying the results of three years' experience in designing these clutches and indicating the angle and width of face, diameter of



cone, area of cork surface, weight of spring, etc., required to give the best results, and we are forwarding to the automobile manufacturers drawings of these in reduced size and will furnish full-size drawings to engineers or manufacturers (without charge therefor) where they will be of use, and we suggest that the publication of this letter or a statement of its contents may be of value to some engineer or prospective manufacturer who may not otherwise have an opportunity to receive these drawings.

NATIONAL BRAKE & CLUTCH CO.,
LAWRENCE WHITCOMB,
Treasurer.

Boston, Mass.

NEW JERSEY'S BIG CLUB TO CHANGE NAME.

NEWARK, N. J., Oct. 13.—It is very probable the name of the New Jersey Automobile and Motor Club will be changed to the New Jersey Automobile Club at the annual meeting of the organization. At the last meeting of the trustees a resolution to that effect was passed, and the matter was referred to the special committee consisting of Secretary A. B. Massena and Dr. James R. English, which was appointed some time ago to revise the by-laws of the club. The club was originally organized to admit motorcyclists as active members, but the by-laws have since been changed so as to admit only automobile owners, hence the word motor is superfluous. It is not likely that there will be any objection to the change.

The new club house will be formally opened on Thursday evening of this week. A delightful program, which will take the nature of a house warming, has been arranged, and several hundred of the members have notified Secretary Massena of their intention to participate in the festivities.

FORT GEORGE CLIMB ON ELECTION DAY.

The New York Automobile Trade Association has postponed its Fort George hill climb, originally scheduled for next Saturday, to Election Day. It has assurance that the Board of Aldermen ordinance giving the permission will be signed by Mayor McClellan. A previous ordinance of the Board of Aldermen intending to grant permission for the climb had failed to provide for police surveillance or to mention the name of the promoting organization. For this reason Mayor McClellan had vetoed it.

Arthur Lee Trying Out a Four-cylinder Maxwell for the Jericho Sweepstakes.

alisbury Wheel Company's "Annual."
n keeping with its established custom, Salisbury Wheel Company of Jamesn, N. Y., gave its annual three days' ertainment to its customers at the comy's camp at Lake Ctautauqua the latter t of last week, and nothing was left one to make the visitors feel that they had the time of their lives before they through. Among those present were the owing: R. Harry Croninger, Penn Auotor Co., Bryn Mawr, Pa.; Benjamin sco, Maxwell-Brisco Motor Co., Tarryn, N. Y.; B. J. Walker, Erie Malleable n Co., Erie, Pa.; Mr. Harris, Driggsbury Ordnance Co., Sharon, Pa.; W. J. idervoort, Moline Auto Co., Moline, Ill.; A. VanWie, Overland Auto Co., Indipolis, Ind.; H. W. Hayden, Dayton Mo- Car Co., Dayton, O.; W. S. Gorton, ndard Welding Co., Cleveland, O.; H. McDonald, W. H. Vanduesen and J. Edsel, of the E. R. Thomas Co., Buf-; B. B. Covert, Covert Auto Co., Lockt, N. Y.; G. W. Atterbury, Autocar ipment Co., Buffalo, N. Y.; S. E. Babk, Babcock Electric Co., Buffalo, N. Y.; nk Barnett, representing *The Automo-* and *Motor Age;* L. W. Palmer, Jamesn, N. Y.; T. G. Meachem, New Process whide Co., Syracuse, N. Y.; Mr. Grunr, secretary of the Auto Manufacturers' dit Association; Charles Backus, West- Malleable Steel Co., Detroit, and E. Sherman, S. H. Penfield, C. A. Mccheon, C. A. Pickard, E. D. Cook and tcher Goodwin, of the Salisbury Wheel

Why Pierce Transmission Is Changed.
peaking of the change from the prossive gear, operated by a small lever on steering column, to the side-lever oper- selective gear, which will be a feature the Pierce cars for the coming season, announcement from the George N. rce Company, Buffalo, is as follows: uch greater significance than appears at t glance is contained in the change in transmission on all the new model rce-Arrow cars. Heretofore cars of this ke have been equipped with a threeed progressive transmission with the r-shifting lever under the steering wheel. w, however, all five Pierce-Arrow modwill have four forward speeds, and selective type of transmission, while gear-shifting lever will be at the side, and will work in an H double slot. Several reasons have been responsible for the retention of the former type after the selective had been proven a success. Among the more potent of these was the fact that it has been the belief of the George N. Pierce Company that the progressive system, with the lever under the steering wheel, is the simplest and most convenient style for the man not thoroughly up in motoring. In other words, the Pierce company held that, in former years, the general autoing public had not advanced in its knowledge of conditions to a point where the selective type would prove more serviceable than the progressive."

Autoists Combine to Fight Thieves.—The automobile owners in Fort Wayne, Ind., have been troubled to such an extent of late by automobile thieves that they have formed the Fort Wayne Automobile Protective Association. At the first meeting over $500 was subscribed to a fund which should be at the disposal of certain officers of the association to use in the apprehension and conviction of all auto thefts and for the purpose of taking some action against the careless throwing of glass and tacks on the highway. The members also pledged themselves to do all in their power to aid in the crusade against those persons owning automobiles who persist in disregarding all speed regulations to the detriment of all others.

Buys Beaver Engine Plant.—The Filer & Stowell Company, Milwaukee, Wis., has secured control of the Beaver Manufacturing Company, builders of Beaver engines, and will conduct the business in the future, gradually increasing the output to about 25 engines per day. A new four-cylinder, 40-45-horsepower, vertical engine will be added to the line, the same design as the present R. A. type. The Filer & Stowell Company's interest in the Beaver Company furnishes ample capital to do business on a large scale which was a much needed requisite of this rapidly growing business. New buildings are being constructed to take care of the increased output, and over one-half of next year's business has already been contracted for.

How One Company Does It.—A six-day conference for traveling mechanics of the Franklin Manufacturing Company, whose duty it is to instruct and assist Franklin dealers in the proper care of Franklin automobiles, has just closed, and the nine men who cover territories that represent all the United States left for their several quarters. The entire week was taken up in study of the 1909 models and their features augmented with talks given by Chief Engineer John Wilkinson and his staff. One day they took a trial of 225 miles in the 1909 models, and during the journey every man was given an opportunity to drive each of the various 1909 models.

Continentals Out of Smaller Races.—Manager Joseph Gilbert, of the Continental Caoutchouc Company, announces that the numerous races which are being held now have so interfered with the regular business of the company that the company will have to withdraw its support from the racing game, except for the large events.

Cleveland Taxicab Company.—The Cleveland Taxicab Co., with its factory in the old Geneva steamer plant at Geneva, O., will not have its new machines ready until the 1st of January. The factory is busy now, but no completed machines will be ready for some time.

Jones Speedometer.—The Jones Speedometer Company of New Rochelle, N. Y., has been incorporated with a capital stock of $100,000, for the manufacture of instruments, tools, machinery, etc.

Oakland, Pontiac, Mich.—The Oakland Motor Car Company, of Pontiac, has filed a certificate at Lansing, increasing the capital stock of the company from $200,000 to $300,000.

Made Record-Breaking Easy.—Herbert Lytle used Harris oil to lubricate the Isotta he drove to victory in last Saturday's Motor Parkway Sweepstakes.

IN AND ABOUT THE AGENCIES.

Rambler, Kansas City, Mo.—The Rambler Automobile Company has been organized with the following named as incorporators: W. L. Lacy, Estel Scott, George Devol, J. R. Nave and E. G. Anderson, the latter to act in the capacity of general manager. The new concern will handle the Rambler line exclusively and establish branches in this section.

American Locomotive, Chicago.—General Sales Manager James Joyce of the American Locomotive Automobile Company has completed arrangements whereby the Chicago branch will be located in the old Zion Tabernacle, at Twelfth street and Michigan avenue. Benjamin C. Day, who has been with the Winton Company for some time, will be in charge.

Lancia, Boston.—The Hol-Tan Company has decided that a Boston branch would be profitable, and have secured quarters at No. 66 Hereford street, where salesrooms will be opened within a few days. W. M. Hilliard, who has driven for the Hol-Tan Company for some time, will be in charge of the new branch.

Gray & Davis, New York City.—A branch of this well-known concern, which has its factory at Amesbury, Mass., has been opened at 377 West Broadway, near Broome street, the telephone number of which is Spring—2478. William H. Gray is in charge of the branch.

Continentals, New York State.—The Continental Caoutchouc Company, 1788-90 Broadway, New York City, has added one more distributing agent to their long list. The Albany Hardware & Iron Company, Albany, N. Y., will represent this company in the Northeast and middle part of New York State.

ozier.—W. S. M. Mead, Eastern sales ager of the Lozier Motor Car Com- , has established the following new cies: Westcott Garage Company, a; A. C. Foss, South Norwalk, Port- er, Stamford and Greenwich; C. S. om, Albany, and Newburg Auto Shop, burg, N. Y.

anklin, Utica, N. Y.—The Franklin r Company has been organized with s in the Commercial Travelers' build- to handle the Franklin cars in Utica. Gardinier, the former manager of . H. Childs & Company automobile ess, bas been elected president and al manager.

ne, Savannah, Ga.—The Graham nobile Company, of No. 14 Bryan , has taken the Georgia agency for the and some adjoining territory. This my has for its president and treasurer es Graham, with Thomas Halligan as ary and general manager.

rry Autocab Company, New York —The Cherry Autocab Company, of York has been incorporated to carry garage and sell and rent automobiles, capital of $25,000. Incorporators: rd Stein, L. L. Dobbin and A. S. t, all of New York City.

Consumer's Auto Supply Com- Pittsburg.—With C. D. Mandille, rmer manager of the automobile de- nt of Kauffmann's store, as presi- nd H. G. Kimmich as treasurer. This n has opened up for business in the block.

h, Philippine Islands.—The Brush ut Company, of Detroit, Mich., re- made a shipment of samples of its t to H. R. Cooper & Company, Philippine Islands. This latter firm present the Brush interests in that y through 1909.

and, Indianapolis.—Charles R. formerly of the Olds Company, anized the Independent Automobile y, which will be located at 214 East ork street, Indianapolis. The new ll carry a complete line of Oakland

on, Utica, N. Y.—Cbarles H. & Company have arranged to act as ting agents for the Jackson cars in ork State outside of New York id will establish branch agencies wns where the trade warrants it.

ell, Indiana.—The agency for the cars in St. Joseph and Elkhart , has been taken by George F. Eb- who will have his headquarters at Second street, Mishawka, Ind.

, Philadelphia.—The Acme cars aken care of by the Theobold Mo- Company, 608 North Broad street. mpany has H. P. Childs for its t, and J. B. Theobold for manager.

Kar, New York City.—The Ap- otor Car Company, in addition to ge on West Eightieth street, has salesroom at 2250 Broadway, for of Kissel Kars.

r Pumps, Boston.—S. F. Heath ny, 288 Columbus avenue, Boston, n appointed New England distrib- the well known Spencer power ps.

New York City.—Charles A. s removed the Moon Agency to in the old Smith & Mabley build- roadway and Fifty-sixth street.

Blanchard, New York City, has incorporated with capital stock , for the manufacture of auto- nd supplies.

Midland Motor Car Company, Kansas City.—This concern has removed to its new quarters at No. 1608 Grand avenue.

Michelin, Philadelphia.—A branch of the Michelin Company has been opened at No. 320 Broad street by H. D. Benners.

PERSONAL TRADE MENTION.

"Pete" Estey, Studebaker Publicist.—Following the announcement to the effect that E. L. Pelletier, of the E-M-F Company, will handle the entire advertising of the Studebaker Automobile Company, as well as the E-M-F campaign, comes the further announcement that Mr. Pelletier has engaged as assistant advertising manager for the Studebaker, F. L. ("Pete") Estey, who for several years has been attached to the automobile department of the Chicago *Inter-Ocean*. Mr. Estey is known to almost every newspaper man in any way interested in the development of the automobile industry. Mr. Pelletier plans to superintend all Studebaker publicity and advertising from the Detroit office, and Mr. Estey will follow up stunts and contests, reporting them in detail.

James F. Patton, superintendent of the F. B. Stearns Co., Cleveland, has resigned to go into the repair business for himself in that city. Patton is very well known in the trade, having been connected with the Stearns company for the past five years. He was presented with a diamond pin and Morris chair upon leaving the factory.

George B. Levy, who has been secretary and sales manager for C. A. Coey & Company, of Chicago, for two years, is leaving that company to go into business for himself in a concern which will be known as the Standard Automobile Supply Company, No. 1428 Michigan avenue, Chicago.

W. F. Reynolds, Southwestern representative for the H. H. Franklin Mfg. Company, finds business in general throughout his territory to be in a most prosperous condition. Automobile dealers are enthusiastic over the outlook.

Frank Lowry, a former Indianapolis newspaper man, well known in the East and Middle West, has signed with the Moline Automobile Company, of East Moline, Ill., to handle publicity and advertising.

F. C. Morgan has been appointed sales manager of the American Automart, 1619 Broadway, New York City, where extensive improvements are being made for the coming winter.

B. F. Blaney has resigned as Boston representative of the Selden car.

GUY VAUGHAN JOINS BENEDICKS

Guy Vaughan, manager of the mechanical department of Wyckoff, Church & Partridge, the Stearns New York agents, well-known as a crack race driver, was married Thursday, October 8, at New Rochelle, N. Y., to Miss Helen Knapp. When the newly married pair started on their wedding journey, which will comprise an automobile trip through the Berkshires and New England, they were pursued in cars by fun-loving tormentors, but managed to outfoot their pursuers.

DEATH OF VETERAN WRITER.

L. C. Boardman, former automobile editor of the Chicago *American*, died in that city on October 7. Mr. Boardman was a graduate from the ranks of cycle newspaperdom, in which he was rated as a pioneer, his bicycle page in the New York *Recorder* bearing a national reputation. He leaves a widow, herself a journalist in the same lines as those of her late husband.

BUSINESS DIFFICULTIES.

The Association of Motor Car Dealers, New York City, which has offices in the *Times* Building, New York City, has made an assignment to John H. Winans. The concern, which was incorporated for $10,000 in March, 1907, has assets consisting of cash in banks, $1,603; accounts, $2,100, and office furniture with the value not given.

A. L. A. M. 1909 HANDBOOK.

The work of publishing the sixth annual "Hand Book of Gasoline Automobiles" is well advanced, and the book will be issued before many weeks. This hand book is the hall mark of the Association of Licensed Automobile Manufacturers, and this year it will be larger and even more attractive in appearance than it has been in the five previous editions.

There was held last week at the rooms of the A. L. A. M. a meeting of the committee which deserves the credit for the merit of the book in the past. Among those present were Thomas Henderson, of the Winton Motor Carriage Company; William E. Metzger, of the Everett-Metzger-Flanders Company; Charles Clifton, of the George N. Pierce Company, and E. P. Chalfant, assistant manager of the A. L. A. M.

Firestone Salesmen at the Firestone Convention Recently Held at Akron, O.

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Fort Pitt Motor Car Co.....54
Franklin Mfg. Co., H. H.....105
French Mfg. Co..... 59

G & J Tire Co..... 80
Gabriel Horn Mfg. Co..... 94
Gaeth Automobile Co..... 98
Gearless Motor Car Co..... 70
Gelszler Bros..... 50
General Accumulator and Bat-
tery Co..... 63
Gibney & Bros., Jas. L..... 50
Glass-Front Cleaner Mfg. Co.. 68
Gray-Hawley Mfg. Co..... 68
Gray & Davis.....cover
Grout Auto Co..... 97
Gyroscope Automobile Co..... 54

Hall Machine Co.....103
Ham Mfg. Co., C. T..... 63
Hardy Co., The R. E..... 64
Harris Oil Co., A. W..... 49
Hartford Suspension Co..... 51
Haws, Geo. A..... 59
Haynes Automobile Co..... 76
Healy Leather Tire Co..... 56
Heinze Electric Co..... 65
Herschell-Spillman Co..... 56
Hers & Co..... 55
Hess-Bright Co..... 99
Hicks Speed Indicator Co..... 70
Hoffman, Geo. W..... 51
Holley Bros. Co..... 51
Holeman Automobile Co..... 65
Holtan Co..... 79
Hopewell Bros..... 50
Hotel Albany..... 84
Hotel Rochester 56
Hotel Tuller..... 84
Hotel Woodstock 70
Howard Motor Works..... 54
Hoyt Electrical Ine. Co..... 66

Ideal Chest Protector Co..... 50
Indestructible Steel Wheel Co. 51

Jackson Automobile Co..... 54
Jeffery-De Witt Co..... 50
Jeffery & Co., Thos. B.....111
Jones Speedometer..... 51

K. W. Ignition Co..... 94
Karl & Co., Adolph..... 55
Keystone Lubricating Co....cover
Kimball Tire Case Co..... 62
Kissel Motor Car Co..... 72
Kokomo Electric Co..... 89
Konigslow, Otto..... 56

Lear Automobile Co., Oscar... 54
Leather Tire Goods Co..... 55
Life Publishing Co..... 50
Lipman Mfg. Co..... 50
Lobee Pump Co..... 51
Locke & Co..... 80
Lockwood Bros..... 68
Locomobile Co. of America.... 54
London Auto Supply Co..... 58
Long Arm System Co..... 59
Long Mfg. Co..... 70
Loring & Son, J. W..... 85
Lucas & Co., John..... 58

Maple City Mfg. Co..... 61
Marvel Mfg. Co..... 89
Mason Motor Car Co..... 71
Masury & Son, John W..... 86
Matheson Motor Car Co..... 91
McCord & Co..... 59
Mechanical & Elec. Mfg. Co.. 61
Merritt & Co..... 56
Michelin Tire Co..... 55
Midland Motor Car Co..... 71
Miller & Starr..... 58
Miller, Chas. E..... 62
Mitchell Motor Car Co..... 54
Model Automobile Co..... 54
Moline Automobile Co..... 71
Monitor Mfg. Co..... 89
Moon Motor Car Co..... 54
Morgan & Wright..... 96
Mosler & Co., A. R..... 58
Moes Photo Engraving Co..... 88
Motor Car Equipment Co..... 61
Motorcar Co..... 85
Motz Clincher Tire & Rub. Co. 55
Muller, Albert..... 58
Mutty Co., L. J..... 81
Myers Auto Top Co..... 58

National Motor Vehicle Co.... 83
National Welding & Mfg. Co.. 83
Neustadt Auto & Supply Co... 63
Never-Miss Spark Plug Co.... 65
N. Y. Sporting Goods Co..... 59
N. Y. & N. J. Lubricant Co.... 88
New Departure Mfg. Co.....100
New Idea Sales Co..... 61
New Process Rawhide Co..... 85
Nordyke & Marmon Co..... 54
Northway Motor & Mfg. Co.... 56
Nuttall Co., R. D..... 56

Oakland Motor Car Co..... 74
Ofeldt & Sons..... 51
Olds Motor Works..... 54
Overland Automobile Co..... 96
Owen & Co., R. M..... 55

Packard Electric Co..... 83
Packard Motor Car Co.....108
Page-Storms Drop Forge Co.. 47
Palmer & Singer Mfg. Co..... 54
Parish & Bingham..... 56
Parker Mfg. Co..... 51
Parker, Stearns & Co..... 56
Pennsylvania Auto Motor Co.. 87
Perfection Non-Skid Climber
Co. 63
Perfection Spring Co..... 51
Perfection Wrench Co..... 50
Peugeot Frères 104
Picrome Hide Co..... 56
Pierce Engine Co..... 54
Pioneer Brass Works..... 56
Pirelli & Co..... 55
Portland Garage Co..... 51
Premier Motor Mfg. Co..... 78
Prest-O-Lite Co.....101

Quimby Co., J. M..... 54

Raimes & Co.....50
Rauch & Lang Carriage Co.... 87
Regal Motor Car Co..... 71
Remy Electric Co..... 51
Republic Rubber Co..... 55
Richardson Engineering Co.... 56
Robert Instrument Co..... 59
Robinson & Son Co., Wm. C.... 51
Rock Island Tool Co..... 84
Rockwood Mfg. Co..... 58
Royal Equipment Co.....83-50
Rushmore Dynamo Works..... 72

Safety Device Co..... 87
Salisbury Wheel & Mfg. Co.... 50
Samson Leather Tire Co..... 51
Schug Electric Co..... 68
Seiden Motor Vehicle Co..... 92
Shaler Co., C. A..... 6[illegible]
Shawver Co..... 61
Shayne & Co., C. C..... 95
Sireno Co..... 51
Siama Tire Protector Co..... 66
Spacke Machine Co., F. W.... 91
Spare Motor Wheel of Am... 68
Speed Changing Pulley Co.... 88
Speedwell Motor Car Co.....100
Spicer Universal Joint Mfg. Co. 56
Spiltdorf, C. F..... 94
Sprague Umbrella Co..... 81
Spring Strap Co..... 63
Standard Co..... 62
Standard Welding Co..... 66
Stanley & Patterson..... 81
Star Speedometer Co..... 90
Stearne Co., F. B.....109
Stevens-Duryea Co..... 99
Stewart & Clark Mfg. Co..... 57
Stitch-in-Time Vulcanizer Co. 64
Streator Motor Car Co..... 85
Stromberg Motor Devices Co.. 95
Studebaker Automobile Co.... 55
Success Auto Buggy Co..... 55
Supplementary Spiral Spring.. 66
Swinehart Clincher Tire Co.. 68
Syracuse Alum. & Bronze Co. 86
Syracuse Chemical Fire Extin-
guisher Co..... 82

Thomas Motor Co., E. R..... 85
Timkin Roller Bearing Axle...101
Trenton Rubber Mfg. Co..... 50
Trimont Mfg. Co..... 66
Triple Action Spring Co..... 84
Trojan Hydro Pneumatic
Wheel Co..... 82
Tucker, C. F..... 50
Turner Brass Works..... 56
Tygert Co., E. A..... 50

Uncas Specialty Co..... 69
Underwood Typewriter Co.... 94
Universal Tire Protector Co... 67

Vacuum Oil Co..... 86
Veeder Mfg. Co..... 92
Victor Clutch Compound Co... 56
Victor Tire Traction Co..... 55

Wachman Auto Mfg. & Sup-
ply 69
Warner Instrument Co.....110
Waverley Co.....107
Weed Chain Tire Grip Co..... 66
Welch Motor Car Co..... 70
Western Motor Co..... 69
Weston Elec. Instrument Co.. 83
Wetherill Finished Castings
Co. 63
Wheeler & Schebler..... 73
White Co.....106
White & Bagley Co..... 85
Whitney Mfg. Co..... 80
Widmer Machine Works, C. A. 58
Willard Storage Battery Co... 69
Willett Engine & Carbureter
Co. 84
Winton Motor Carriage Co....112
Wisconsin Tire Protector Co.. 69
Witherbee Igniter Co..... 51
Wyman & Gordon Co..... 47

York Motor Car Co..... 80

L. XIX NEW YORK—THURSDAY, OCTOBER 22, 1908—CHICAGO No. 17

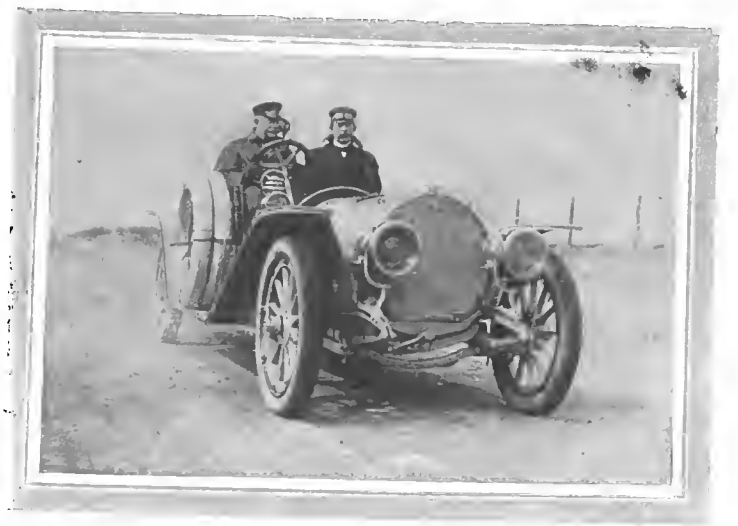
THE AUTOMOBILE

ALL IS READY FOR FOURTH VANDERBILT RACE

GINNING at daylight next Saturday morning will be run the fourth race for the William K. Vanderbilt, Jr., Cup eleven laps of a 23.45 mile course, aggregating 257.983

Seven European and twelve American cars have drawn ig numbers. They embrace for the most part cars of ished records, and, in the matter of pilots, proven long- ce performers. In their number and the variety of their they are adequately representative of the fastest and enduring brands of the foreign and domestic product. of them were contenders in the third Vanderbilt race.

ne of the two iobiles, Joseph scored the fast- of that contest, e Thomas, which Salzman is to with Le Blon at ieel, finished a- f all the Ameri- rs in that mem- struggle. The es, entered by Graves, was by Jenatzy in 6 race, and the iss, to be driven patrick, is said duplicate of the Elliot F. Shep- d. A second of 06 Vanderbilt es will have at el Howard W. Baltimore ama- e third Buffalo



Chairman Thompson of Cup Commission and Major Crowley of Irish Brigade.

e is the Thomas used by Louis Strang in the Grand Prix year. Foxhall P. Keene will again drive his former s. Two other contenders were built for the last Vander- ocomobile as an emergency substitute for Tracy's car, in t of an accident in practice, and a B. L. M. not com- time to competc.

f the new candidates for cup honors among the cars eady won distinction—the Isotta by its succession of in the Savannah, Briarcliff, Lowell and Sweepstakes; x by finishing second in the Lowell contest, and the evolving third at Savannah and second at Philadelphia. ting as will be the meeting of these seasoned racers ddition of much new speed blood, it will not compare excitement of the competition among the coterie of illful, and competent drivers of long distance racing in try has developed in the past two years. Public attention is to a considerable extent centered on a trio of drivers, whose performances during the season just closing and successes in very recent races have placed them at the head of the American speed squadron. Herbert Lytle, who was a Pope-Toledo pilot of former Vanderbilt races, is to man the Isotta he drove to victory in the Motor Parkway Sweepstakes. Louis Strang, who was at the wheel of the Isotta at Savannah, Briarcliff and Lowell, is to drive for Paul LaCroix, the Renault that put up a new world's record for 100 miles on Ormond beach. Strang's stirring struggle in a stock car Renault in the last 24-hour race at Brighton Beach, in which he alternated in the lead with the Isotta until his car was put out of the running by an accident, is fresh in the public mind, followed as it was by his close pursuit of Lytle in the Sweepstakes, also in a 40-45 horsepower stock car. The third member of the rival trio, George Robertson, will pilot the Locomobile he drove to victory at Philadelphia, following his capture of the last Brighton Beach 24-hour race in a Simplex.

William K. Vanderbilt, Jr., has secured Walter Luttgen, a veteran of the Long Island classic, to drive his Mercedes. At the wheel of Mr. Graves' Mercedes will be Emil Stricker, who has been a Porthos pilot in the Grand Prix contests. The Hotchkiss will be guided by H. J. Kilpatrick, who was the driver of the Shepard Hotchkiss when it scored the world's straightaway mile road record at Jamaica last spring.

Willie Haupt, J. B. Ryall, Cyrus Patschke, and William Bourque. drivers of no little experience in long-distance road and track contests in this country, will be found respectively in the seats of the Chadwick, Matheson, Acme, and Knox cup candidates. The pilotage of the Le Blon Thomas has been entrusted to George Salzman, who has won fame in endurance runs and road record trials, and the fate of the new Matheson racer to Louis Chevrolet, who several years ago scored not a few track records for Major Miller in a Fiat.

Leon Pouget, Brasier; Howard Gill, Thomas, and Thomas

Willie Haupt in the Six-cylinder Chadwick, Which Is Rated at 90-Horsepower.

illiams, B. L. M., are practically unknown to road racing, is also Alfred Dennison, who has been substituted for Charles isle as the pilot of the big Knox.

Jim Florida, who has been driving the second Locomobile in actice, may be the final pilot of this car. Wednesday it became own that the Grand Prix Thomas would not be able to meet e weight restrictions of the contest, and, therefore, its entry om the race was withdrawn.

Previous Races for the Cup.

The first Vanderbilt Cup race was run in 1904. It was run ith controls. Its net distance was 284.4 miles. The race re-lted in a memorable duel between George Heath, Panhard, id Albert Clement, Clement-Bayard, the former winning by a arrow margin in 5:26:45 net, an average of 52.2 miles per hour. is fastest lap averaged 67.2 miles. The fastest round of the ce showed an average of 70.8 miles per hour, which was ored by Teste in a Panhard.

Controls were abolished the next year, the course being 283 iles. Hemery in a Darracq evolved as the winner in 4:36:08. eorge Heath piloting a Panhard was second. Joseph Tracy in a Locomobile was third, being the first American combination of car and driver to officially finish in an international road race. Hemery averaged 61.49 for the race and 68.42 for his fastest lap. Lancia, Fiat, however, scored the swiftest round with an average of 72.88 miles per hour.

The third race for the cup took place in 1906 over a 297-mile course, and resulted in another victory for the Darracq, Wagner winning in 4:50:10, with an average of 61.43 for the race and 65.11 for his fastest lap. The best round of the race, however, was scored by Joe Tracy in a Locomobile, at an average rate of 67.66 miles per hour.

Effectual Guarding of the Course.

The crowd at the 1906 event was enormous and almost uncontrollable. But one fatality to spectators, however, resulted, though there were several onlookers injured. The result was that the A. A. A. Racing Board voted not to hold any further contest for the cup until it could be adequately guarded by militia as well as police, or to be run over a protected course. The wisdom of the A. A. A.'s policy in this particular has been very generally recognized, so that at practically all of the big road races, and even at hill climbs the promoters have succeeded in providing militia to guard the course.

The A. A. A. in 1907 failed to secure legislative action or the sanction of the Governor to use State troops and the race was not run. It is interesting to note that those who howled the loudest at the postponement, have been foremost in casting obstacles in the way of the present contest being run. The building of the Motor Parkway, however, solved the problem for this year. Although but a portion of it has been completed, it is over that section of the course that the chief danger would arise and that is protected from end to end by a high wire fence. The militia protection will be afforded by Thomas Francis Meahers' Irish Brigade, a corps made up largely of veterans, who saw service in the Spanish war, and had its first service in the war of the Secession. In its ranks are many trained athletes. They will co-operate with the Pinkerton men, and Nassau county deputies, the soldiers being detailed more particularly at turns and in places where the greatest crowds are sure to congregate.

The Acme Six-cylinder, Rated at 60-Horsepower, to Be Driven by Patschke.

That Dream of an Autoway.

That nine miles of cement parkway will be included in the 23.45-mile circuit, over which this year's Vanderbilt Cup race will be run, marks a new era in automobile road racing, the entire fulfillment of which will come with the completion of the entire 60 miles stretch of the Long Island Motor Parkway next season. The great American classic next year will be run over a speedway exclusively constructed for automobile traffic without speed limitations.

Almost since the birth of the motor car there has been a dream of such an automobile roadway. For nearly a decade there had appeared in print "fairy tales" of the projected building of such a great speedway at the gates of the metropolis. It was for the American Automobile Association, however, to take the initiative step toward the realization of this

. On October 6, two days before the last Vanderbilt Cup he directors of the national body passed resolutions direct- e president of the association to appoint "a committee of to consider various propositions to conduct automobile on especially reserved rights of way, and, in view of the ility of conducting the elimination race for 1907, to in- the committee to at once carefully consider such propo- as may be submitted before referring them to the full of Directors."

liam K. Vanderbilt, Jr., Jefferson deMont Thompson, . R. Pardington, the committee appointed by President kiss, considered propositions made for speedways in the of New York, New Jersey, and Connecticut. The com- did not let grass grow under their feet, for on October ere was a conference of wealthy Long Island property s at the Lawyers' Club, the outcome of which was the ay proposition. Assurances of financial support came so tly, not only from Long Island, but from automobile

George Robertson and No. 16 Locomobile, a Likely Combination—Designer A. L. Riker in the Background on the Right.

as well, that on December 18, 1906, the Long Island Parkway was incorporated with a capital of $2,500,000. months of persistent hustling and diplomatic effort to right of way followed. Success was finally attained. ne 6 of the present year work was begun with appro- naugural ceremonies near Central Park station, and rapid icient constructive work resulted in the present stretch

being completed in ample time for the preliminary practice for the novel combination sweepstakes, run over the full Vanderbilt course on October 11, resulting in the winner of the principal race proving the speed qualities of the new course by setting up a new American road record, supplanting by a big margin the former figures established first by Heath, then by Hemery, and closely approached by Wagner in the last contest.

Cars Are Practicing Daily.

Following the drawing of the position numbers last week daylight practice over the course began. A large majority of the entrants were easily able to show laps running from 21 to 23 minutes. But one accident marred the tryouts. Emil Stricker on Sunday last was rounding the Jericho turn at high speed in Robert Graves' Mercedes, when a tire blew out. The car dashed through a fence, throwing out Stricker and his mechanic, Arthur Murray. Both members of the crew were taken to the Nassau County Hospital at Mineola. Stricker, who was badly bruised, is confident of being able to drive in the race. Murray, however, was more seriously injured, having sustained concussion of the brain. The car escaped with a broken rim and hood, and was soon repaired and will start Saturday.

The weighing-in of the cars took place at Gray's scales at Garden City yesterday. Several cars were over weight and found it necessary to reduce in order to make 2,644.8 pounds.

DETAILS OF THE NINETEEN CARS ENTERED FOR THE FOURTH RACE FOR THE VANDERBILT CUP.

CAR	*H.P.*	*Country*	*Entrant*	*Driver*	*Cyls.*	*Bore*	*Stroke*	*Clutch*	*Wheelbase*	*Tires*
OMOBILE	120	America	Locomobile Co.	Florida	4	7 ¼	6 ¼	Cone	110	Diamond
X	40	America	Knox Auto Co.	Dennison	4	5 ½	5 ½	Three-plate	106	Fish
CEDES	120	Germany	Robert Graves	Stricker	4	6.68	5.9	Lindsay	107	Michelin
DWICK	90	America	Chadwick Eng. Works	Haupt	6	5	6		112	Michelin
CEDES	120	Germany	W. K. Vanderbilt, Jr.	Luttgen	4	4.68	5.9	Lindsay	107	Michelin
TA	60	Italy	Clarence V. Brokaw	Lytle	4	5.7	4.72	Multi-disc	118	Michelin
HESON	60	America	Matheson M. C. Co.	Ryall	4	6	6	Multi-disc	128	Diamond
MAS	80	America	E. R. Thomas Co.		4	6	5.7	Three-plate	112	
CHKISS	120	France	Hotchkiss Import Co.	Kilpatrick	4	7	6.28	Cone	104	Michelin
IER	96	France	H. Payne Whitney	Pouget	4	6.39	5.5	Cone	104	Michelin
E	60	America	Cordner & Flinn	Patschke	6	4.99	5.5	Cone (cork inserts)	108	Diamond
MAS	115	America	E. R. Thomas Co.	Salzman	4	6 ⅜	5 ½	Three-plate	104	Michelin
M	85	America	Thomas Williams	Williams	4	6	6	Helical band	86	Michelin
HESON	85.5	America	Matheson M. C. Co.	Chevrolet	4	7 ¼	6	Multi-disc	96	Michelin
OMOBILE	120	America	Locomobile Co.	Robertson	4	7 ¼	6 ¼	Cone	110	Michelin
AULT	115	France	Paul LaCroix	Strang	4	6 ¼	6	Internal Expanding	112	Michelin
CEDES	120	Germany	Foxhall Keene	Keene	4	6.68	5.9	Lindsay	107	Michelin
MAS	115	America	E. R. Thomas Co.	Gill	4	6 ⅜	5 ½	Three-plate	104	Michelin
X	40	America	Knox Auto Co.	Bourque	4	4 ⅜	4 ¾	Three-plate	102	Fisk

The Two Matheson Candidates for Cup Honors.

Luttgen and Mate Don't Look Like Daredevils.

WHAT FRANCE WANTS FOR 1909 INTERNATIONAL RULES

PARIS, Oct. 15.—France wants a maximum bore of 140 millimeters (5.51 inches) for a four-cylinder engine, and a minimum weight of 1,984 pounds as the essential conditions of the 1909 Grand Prix and of all international races held throughout the world. It was a foregone conclusion that the 155 millimeter bore and 1,100 kilos minimum weight would be abandoned after this year, for the 1908 season has proved that cars are too fast for tires to stand the strain.

The Sporting Commission's regulations will be submitted to the international conference of recognized clubs, to be held in Paris, October 19, and will doubtless come in for severe criticism, Germany, Italy, and England being in favor of a reduction to 130 or even 120 millimeters for the four-cylinder engines. As the French delegates have instructions to hold out for the 5 1-2-inch limit, the fight is likely to be a keen one. The argument of the other members of the congress is that with 140 millimeters and the reduced weight cars will be as fast as this year, and there will be danger of the tire falsifying the mechanical results. When the present rule was formulated at Ostend, Germany was in favor of 135 millimeters, while France held out for 160. In a spirit of compromise France came down to 155, the belief then being that the reduction would produce a car slightly lower than the square motors of 170 and 180 millimeters bore, and as Henry Brasier expressed it, "It would be valuable to slightly reduce the bore each year and still maintain the same average speed." The possibilities of long-stroke engines were not sufficiently realized by the experts, as is proved by the fact that contrary to general expectations, more power was obtained with the restricted bores than with the unlimited engines. With a bore of 130 millimeters an average long-distance speed of nearly 70 miles an hour is possible on a good course, and at such a rate of travel tires are near their limits of resistance. It is probable France will have to come down to 155 millimeters.

The question of the changing of wheels will come up for discussion at the meeting, with the probable result that this departure from standard racing practice will be allowed. The question was brought forward prominently last year, when S. F. Edge asked to be allowed to use Rudge-Whitworth dismountable wheels. His request was refused, and he thereupon commenced an active campaign that was doubtless more profitable than winning the Grand Prix. As the last Grand Prix was largely lost to the French by the failure of rims and tires, and as the English device allows a reduction in weight of 140 pounds per car, it is likely that France will have no objection to the change.

For voiturettes it has been decided to increase the bore where two and four-cylinders are employed. For one-lungers 100 millimeters remains as the maximum bore. For two-cylinder cars the limit of bore has been carried from 78 to 80 millimeters, and for four-cylinder engines the maximum bore will be 65 in place of 62 millimeters. This, however, will not affect the international conference, the French voiturette race being considered a national affair.

What the International Committee Will Recommend.

PARIS, Oct. 20.—At a meeting to-day of the racing committee of the International Association of Recognized Automobile Clubs it was decided to recommend that the rules for high speed racing in 1909 limit the cars to a minimum weight of 900 kilograms (1,984 pounds) with a cylinder bore of 133 millimeters (5.23 inches) limitations.

Dennison (Knox) Changing a Demountable Rim.

Robert Gravee's Mercedes After Its Sunday An

USE OF THE FARM TRACTOR IN FRANCE

By W. F. BRADLEY.

RGES, France, Oct. 15.—Central France, the most highly eveloped agricultural district of the world, has been se- is the spot for the first International Agricultural Motor ion. But though this is a country where the land is made uce its maximum, it is not one in which mechanical aids to ture have been most highly developed. Thus, when the ition for mechanical means of plowing was commenced, ee machines which lined up in front of the judges were ively from Chicago, Bedfordshire, England, and Paris. n the International Harvester Company's machines are old articles in France, the American tractor is a new fea- nd as such was watched with considerable interest. The Ivel machine is one which has made itself known in the s and foreign countries during the last three or four years, French Castelin is practically a new comer. The method ation on both the American and British appliance was for stroke. First connection with the transmission gear is a leather-faced cone clutch, the gear being reduced twice before drive is finally taken to rear axle by a single chain. Though water cooled, the engine has no radiator, the necessary amount of water being carried in a large tank at the rear of the machine and circulation assured by thermo-syphon. The road wheels are all metallic, the two rear ones taking the drive, and the single front one being steering. When used across country, transverse ribs are attached to the face of each of the rear wheels, being detached when running on macadam roads.

The Castelin tractor has a single-cylinder vertical De Dion motor as its power producer, the bore and stroke being 4 3-10 x 5 1-10 inches. The engine is water cooled, has automatic inlet, mechanical exhaust, and ignition by storage batteries. Power is transmitted to the front wheels by means of a low-reducing gear, a countershaft and side chains. The rear wheels are

International Harvester Tractor In Actual Service.

The Ivel Tractor Doing Some Real Practical Work.

ctor to pass over the with a plow in the rear, n operating the tractor other looking after the The French machine re- stationary, dragging its rough the ground by of a couple of winding a fixed point, a pulley, eel cable.

ree machines were put practical tests on a d divided off into equal e award of the judges ade on the speed with e work is done, is reg- nd economy of opera- o report has yet been t it is evident that the prize distribution will be between sher and the Yankee only.

ternational Harvester Company's tractor consists of a linder horizontal engine, mounted on a four-wheel car- he engine is of the long-stroke stationary type, with two wheels, and a modified form of water tank forward, the leaving the engine being sprayed through a fine wire een, then collected in a tank below. The valves are in the exhaust only being mechanically operated, and the ntrolled by a governor operating on the exhaust lift.

el machine is a compact three wheeler, having as its nt a double opposed engine of 6 x 6 inches bore and

Castelin Tractor Coping with a Wire Cable.

steering, with control by tiller. For stationary work, the drive is taken in a similar manner from a separate countershaft bearing small pinions to the drumshaft by means of side chains. When required for plowing, the tractor is immobilized by dropping down a powerful strut and fixing in the ground a couple of posts between which is laid a chain to carry the pulley, around which the cable runs. The practical operation is the simple one of setting the winding drums in operation and drawing the plow through the ground, one man remaining in charge of it, while another occupies himself with the engine.

Although interesting comparisons could be made by watching the three machines at work together in one field, it was impossible to arrive at very definite conclusions without detail figures of cost of operation in each case. The French tractor, having the lowest power and the lowest initial cost, would at first sight appear to be the most economical, but, as the tests showed on rough ground, the cable had difficulty in performing what was accomplished easily by the two hauling tractors.

After the plowing tests the tractors were invited to operate a reaper, which task was very successfully accomplished by both

he Ivel and the International Harvester machine; the Castelin id not take part in this. Finally, by means of belt connection, he three tractors were put to stationary engine work, driving arious types of farm machines.

The feature of the exhibition held for one week in the town f Bourges was the number of stationary engines of various ypes operating threshers, grinding mills, choppers, churns, saws, tc. Single cylinder machines of both horizontal and vertical ype were in the immense majority, and varied in power from 1 o 30 horsepower. Gasoline was practically the only fuel used, he alcohol section, which it was expected would be important, failing to attract entries; steam was unrepresented, with the exception of one English tractor. Single cylinder engines, vertical type, with mechanically operated valves and high-tension magneto, mounted on a light carriage with two wheels, were shown in numbers, generally linked up with a water pump, or provided ith pulley for belt connection to various machinery. It is in this direction that the greatest opening for the introduction of internal combustion motors to agriculture in France is likely to be found.

During the exhibition lectures were given by experts on the application of motors to farming, comparative costs supplied, and general pioneer work undertaken.

GOOD RESULTS OBTAINED WITH VARIOUS FUELS IN FRENCH TEST

PARIS, Oct. 15.—Gasoline is not the only fuel on which automobiles can be run economically, as is proved by the taxicab and delivery vehicle competition which has just taken place in the neighborhood of Paris. The competitors were given a difficult course in the vicinity of the capital to be covered each day, giving a daily distance of 76 miles. Sixty per cent. of the course was over rought paving stones such as the environs of Paris alone can provide; 30 per cent. was over bad macadam; the rest of the course was good going. Hills, with a maximum grade of 12 per cent., tested the climbing abilities of the cars.

Gasoline, White Spirit, carburated alcohol, benzol, and any fuel the competitor desired had to be used on five successive days. Before each fuel test the vehicles went over the course with the fuel they were to use on the following day, but without any other control than that of a time schedule. This allowed them to make the necessary adjustments and tune up the carbureter for the fuel test, all the work being done by the driver only, no mechanics being allowed on the cars.

The annexed table tells the story of the competition, the chief feature of which was the good results obtained on various fuels and the small amount of fuel used. There were no mechanical defects except on a Cottereau, which overheated, was supplied too suddenly with cold water, and cracked a water jacket. The vehicles engaged consisted of a couple of single-cylinder De Dions of 100 by 120 bore and stroke, one having an hotel omnibus body and the other a closed delivery van, both loaded with sacks of sand; Unic had a four-cylinder 12-horsepower hotel 'bus and a similar chassis with a delivery body; Cottereau had a four-cylinder cab, 85 by 105 bore and stroke; and a three-cylinder engine, which failed to finish; Vinot had a 80 by 110 four-cylinder taxicab; Bayard-Clement had a couple of two-cylinder chassis, 85 by 110 bore and stroke, developing 10-horsepower, the one carrying a taxicab body, the other a closed delivery van. In each case the full load was carried in the shape of ballast, and interior dimensions were demanded for all delivery vehicles. The following table shows the comparative consumptions with the four different fuels employed. It is worth noting that the circuit was the same for each test, the roads always dry, and the weather fine from beginning to end.

	Vehicle.	Cylinders.	Bore and Stroke.	H. P.	Total Weight, Pounds.	Fuel Consumed, 76 miles. Gasoline, 680 deg. gallons.	White Spirit, gals.	Alcohol, 50% gals.	Benzol, gals.
1	De Dion - Bouton 'bus	1	100x120	8-9	4,890	3.04	2.63	3.30	2.60
2	Unic 'bus	4	76x119	12-14	4,386	2.63	2.48	2.92	2.17
3	Cottereau taxicab	4	85x106	16	3,638	3.62	3.16	3.47	3.22
4	Vinot-Deguingand taxicab	4	80x110	12-16	3,119	2.56	2.62	2.89	2.20
5	Unic taxicab	4	76x110	12-14	2,976	2.29	2.17	3.01	1.84
6	Bayard-Clement taxicab	2	86x120	10	2,436	2.05	1.79	2.17	1.55
7	Demeester delivery van	4	72x80	10	2,050	2.99	2.18	2.43	1.70
10	Unic delivery van	4	76x110	12-14	4,250	2.40	2.39	2.69	2.03
11	De Dion - Bouton delivery van	1	100x120	8-9	5,522	4.04	3.62	3.60	2.86
12	Cottereau delivery van	3	85x105	10	4,772	6.87	Retired.		
13	Bayard - Clement delivery van	2	85x120	10	3,042	1.95	1.98	2.21	1.81

With one exception the carbureters were not changed for the tests with different fuels, the drivers merely changing the floats and in some cases putting in different nozzles. There was considerable difficulty in starting up cold on alcohol, but once going the engines ran well and seemed to develop as much power as with the other fuels. The slight difference in time at the various controls shows that the engines were not disadvantaged by the frequent changes of fuel. Final awards will be made on a price basis only, the car in each class having the lowest expenditure for fuel being the winner. Owing to the small number of entries in the various classes the competitors are grouped in the accompanying table.

JACOB'S LADDER TO HAVE AN IMPROVED ROADWAY

BOSTON, Oct. 19.—One of the most important contracts for State road, in the opinion of autoists, ever given out by the Massachusetts Highway Commission, was that which has been awarded to Joseph F. McCormick, of East Providence, for constructing a road around the famous Jacob's Ladder grade in the Berkshires. The contract involves an expenditure of $37,352, and by its terms requires that the new road shall be completed by August 15, 1909. To do the work within the time limit the contractor will have to use a double force all the time. He has already begun getting the materials on the ground and intends to make a big start this fall.

Jacob's Ladder, with a maximum grade of 16 per cent., lies on the most direct route between Lenox, Pittsfield and the western towns and Springfield and other places in the central and eastern part of the State. It can only be avoided by a long detour over poor roads and ever since automobiles came into use has been one of the most troublesome grades in the State. Incidentally Jacob's Ladder has been a gold mine for the farmers in the neighborhood, as they have earned good pay hauling automobiles over the hill.

The new State road will have a maximum grade of 6.36 per cent. It will start at the end of the State road in Chester, and for some distance will be built on the site of the present highway, three new concrete bridges being a part of the contract. After a stretch of new road on the old site, the route will swing northward, paralleling the present road, but with easier grades. It will then return to the present right of way and follow it to near the base of Jacob's Ladder. From there another detour will be made of about 6,500 feet around the hill. The contract calls for the construction of 3 1-2 miles of road.

C. G. Bleasdale and His Maxwell, a Perfect Scorer.

Perfect Score Thomas Light "Six," Geo. Sperry Driving.

FOUR ADJUDGED PERFECT IN CLEVELAND TEST

VELAND, Oct. 17.—The most successful endurance con-
st ever held under the auspices and direction of the
nd Automobile Club came to a close in this city last
with four cars out of the original nine starters having
cores.

committee in charge had some mighty hard points to

At first brush the Maxwell four-cylinder roadster,
by C. G. Bleasdale, was given the only perfect score,
er three hours' consideration, and having had a number of
ficials, entrants, and drivers on the carpet, the Garford
car driven by E. E. Ernest, C. S. Carris' Franklin, and
v Thomas light six, handled by George Sperry, were de-
to have perfect records. This decision was not arrived
l very late last night, the chairman of the contest com-
W. F. Bonnell, being called from his home to reconsider
inal decision.

1 the tbird day's work had been finished, and D. E. Bee-
f Chicago, was examining the cars, it was found that the
of the Garford touring car, A. R. Davis, secretary of
ford company, had been told that if he would enter at
e hour, it being the afternoon before the start, his car
ıot have to take the brake test. His machine was brand
ken off the salesroom floor, and was admittedly not in
n for such a contest. With the knowledge that he
ıot be penalized for loose brakes, his car went in, com-
ɔugh perfectly. Driver Ernest, when ordered to take
ɛe test, refused to do so, and 'phoned for Davis to
the examination. Upon arrival Davis told his side of
r, but the technical examiners could not remit the test,
is then stood for it, the car going too far on the foot test. Davis later appeared before the committee and clearly stated his side of the case, also declining to protest the decision in case his car was penalized, as he did not wish to make trouble for the local club. Under the circumstances, and upon the recommendation of Mr. Beecroft, the brake test was not counted at all. This allowed the Garford and Thomas to have perfect scores, the latter car having originally suffered a penalization of five points on the hand brake test.

The Franklin's case was very queer. It appeared that the car ran many miles out the right way owing to wrong confetti marking, and, being compelled to "beat it" at a fast clip, ran out of oil. This gave the car a penalty of twelve points on the second day. After the contest was over, however, it was found that many observers had been lax, and that oil had been used in other cars in violation of the rules without having been noted. The drivers afterwards admitted this, claiming that, owing to the lateness of their entry, they had not studied the rules carefully. It would have been impossible to penalize all cars, owing to lack of clear information, and had the Franklin penalty stood, it would have been manifestly unjust to that one car. Consequently Chairman Bonnell gave the Franklin a clean score under the circumstances.

The run was a most severe one for several reasons. In the first place the schedule called for a straight twenty miles an hour, with an average daily distance of 157 miles, and four controls each day, the object of which will be explained later. This meant that the cars could keep ahead of their schedule but a few miles, for whatever they gained would be quickly lost, as they had to wait to allow the schedules to catch up. Combine this with a twenty mile average on the last portion of the

S. Carris "Beating It" in Clean Score Franklin.

E. E. Ernest's Garford "30"—Another Clean Scorer.

day's running, which took the cars through the streets of Cleveland when the traffic was the densest, and one can gain an idea of the speed required.

The perfect scores commenced to go by the board the first day, when a loosened screw in the coil box of the Stoddard-Dayton caused trouble. Driver Moore broke both his bonnet and battery box seals before locating the trouble in the coil, and suffered a penalty of 53 points. All the other machines ran into the control that night with nary a penalty, but early the next day the severe pace commenced to tell.

The first car to get into trouble was the steady little Chalmers "30." The motor died, and from its actions Driver Stickney went after his spark plugs, changing them, the trouble then being found to be dead batteries. Being unable to locate an extra set in the car, Stickney telephoned ahead to Chagrin Falls, and after waiting a half hour, one of the passengers found some tucked away under one of the seats. Stickney hurriedly wired them up, and a few minutes later was tearing along. Incidentally, he passed the relief car from Chagrin Falls at such a fast clip that he was not recognized. His car was penalized, of course, for breaking the seals and work done, but he might

Oldfield Carrying the Officials in the Stearns "Six."

have made up his lost running time had it not been for the fact that the short controls prevented. As it was, he drew 209 points.

Then Wedler's Garford roadster, the only amateur entry, found trouble, the radiator springing a leak which necessitated refilling twice. This penalized him 14 points.

Johnson's Jackson was the next to suffer, breaking a main bearing just out of Youngstown. This put the car down and out, and at the end of the second day left the Garford touring car, Thomas light six, Maxwell and Chalmers "40" fighting for honors with clean scores, the Franklin having drawn the penalty which was afterward removed.

Early the next morning the Chalmers "40" went out, the fan breaking and tearing a hole in the radiator. Driver Emerson could have continued without the fan, but he was unable to plug the radiator leak. Nothing else was penalized that day, the cars coming through to the examination in splendid shape, surprising even Examiner Beecroft. In fact, after carefully looking over every machine as to wheels, axles, springs, motors, clutches, fans, bearings, differentials, mufflers, steering mechanism, transmissions, ignition systems, etc., only one lone car was found to have the slightest trouble, the amateur Garford, which, by the way, was entered at the last moment without preparation, having the front wheels sprung one-quarter of an inch. Everything else was ship-shape throughout on all the machines, and the condition of the springs after the many hard humps was universally commended. Not one had sagged a quarter of an inch.

Then came the committee meeting Friday night, and the changing of penalties, as noted above.

The only trouble with the entire event was the fact that it was really gotten up at the last moment, six of the nine entries coming in the day before the start. Then, too, the confetti was sprinkled by a man who knew nothing about such work, and was carried in a competing car. Aside from this, the contest was handled in a brisk, snappy manner, and plans are even now being made to repeat it in the future.

The event just finished introduces to the trade a new figure—W. B. Bonnell, next president of the Cleveland Automobile Club. This was the first event ever handled by Mr. Bonnell, and although handicapped by the work of some of the club officials, he swung the contest with admirable vigor.

To D. E. Beecroft, vice-chairman of the Technical Board of the A. A. A., is due the credit of making the contest a real event when everything looked black. At the conclusion of his work Friday evening he was given a real ovation by the crowd in the club rooms, and a motion to ask him to assist him in the next run brought a hearty assenting vote.

Of secondary consideration in the minds of the contestants, but of considerable import to the Automobile Club officers, was the "speaking" feature of this run. An effort, quite successful, was made to interest the farmers in this contest, and to bring home to them in a forcible manner the best way to secure good roads throughout the State. Barney Oldfield, with his six-cylinder Stearns racer, carried a number of well-known Cleveland citizens along, who made addresses at the short controls to the farmers who had previously been notified of their coming. At these controls every car was held for ten minutes, and as a result, by the time the speaking commenced anywhere from three to nine cars, dust covered and showing the strains of travel, were lined up. A crowd was naturally drawn, then the speakers introduced the subject of good roads, the best way to secure appropriations for this purpose, etc. But, be it related, the speaker generally made one mistake, for Barney Oldfield was introduced, and the fact that he had his racing car along was mentioned. Whereupon Barney seemed to rivet the greater share of the farmers' attention upon himself and car.

Following is the summary of the run:

No.	Car.	Driver.	H.P.	Cyls.	Score.
8.	Maxwell	C. G. Bleasdale	28	4	1,000
6.	Thomas	George Sperry	40	6	1,000
7.	Garford	E. E. Ernest	30	4	1,000
3.	Franklin	C. S. Carris	28	4	1,000
2.	Garford	C. R. Wedler	30	4	946
1.	Stoddard-Dayton	H. S. Moore	45	4	922
12.	Chalmers-Detroit 30	J. H. Stickney	30	4	791
4.	Chalmers-Detroit 40	Sam Emerson	40	4	—
9.	Jackson	Grant Johnson	40	4	—

PHILADELPHIA NOW WANTS ANNUAL RACE.

PHILADELPHIA, Oct. 19.—Since the phenomenal success scored by the Quaker City Motor Club with its 200-mile Founders' Week race little else has been talked of here. Some of the more enthusiastic of the Quakers are even talking of putting on a 24-hour race in November, but there is a division of sentiment over this scheme, and it will likely be abandoned for the reason that November weather is not suitable for an all-night grind and that a profitable "gate" is improbable.

The city fathers are so enamored of the thrilling wind-up the Q. C. M. C. furnished them for the Founders' Week program that when sounded on a proposition to make such a race an annual fixture in Fairmount Park every man-Jack of them acquiesced and said that it would be a good thing to advertise the city.

The "consistency cup" for regularity of running throughout the contest was awarded to the Acme, driven by Patshke, which was the cup for second place.

Last Wednesday a committee of inspection from the Fairmount Park Commission went over the course and found that in two working days it had been restored to its former condition; in fact, it is in better shape, for while many other of the park roads were inordinately dusty as a result of the dry weather, those roads forming the 7.8 mile course were clean and smooth. The $2,500 bond put up by the club to guarantee repairs will be returned less than $500 shy. The $25,000 bond put up to make the city safe, in event of suits instituted for injuries from accidents, will be returned intact.

THE UTILITY OF AUTOMOBILE CLUTCHES

By THOS. J. FAY, E. E., President Society of Automobile Engineers

THERE are very few clutches of the type involving the expanding hand, and, as a rule, they are not so good as to warrant their use. The mechanism required to move the shoes is complex, and centrifugal force is bound to play an undesirable part. If the shoes are of manganese bronze with cork inserts, as in Fig. 3, the surfaces will hold to the work to a marvelous extent, provided the mechanism is such as to serve for the clutching function to an adequate degree. Cone clutches of the conventional sort were once so prevalent as to lead one to the conclusion that they were the permanent standard. Fortunately, there is no such thing as a standard, excepting in so far as principles must hold throughout the designs.

Fig. 3—Shoe of expanding band clutch, fitted with cork inserts.

The earlier cone clutches were faced with leather, riveted onto the periphery, without any means of providing for evenness of contact. The leather thus did not serve the purpose well, and the next important improvement was hy way of flat steel springs under the leather facing, with a view of pressing the leather into contact at numerous points around the entire circumference. This scheme made cone clutches possihle. For a time after this innovation it looked as if cone clutches were the acme of perfection, hut the adoption of cork inserts protruding through the leather rendered the clutches far more stable and lasting. Cork inserts, if well placed and of sufficient surface, work very well indeed without any leather.

Fig. 4 shows a leather-faced cone clutch, with the cork inserts located around the periphery. The same figure will serve to illustrate this particular type in general, since the only difference lies in the application of the cork, in which event the section of the aluminum spider must he provided with inwardly projecting "bosses" in which the holes may he drilled to take the corks. With the cork inserts there is a slight increase of weight if leather is used as well. If, on the other hand, cork alone is used, the weight is lower for the cork insert cone clutch than it is if the leather facing is used. Leather is heavy, especially if we consider that the requirement for the average cone clutch is not far from 75 cuhic inches. It must also he borne in mind that the leather is at the extreme radius, where weight is the greatest detriment. Through the courtesy of the National Brake and Clutch Company I am enabled to offer some data of the performance of cork in clutch service, which data was procured by that company for the purpose of aiding designers in the process of applying cork to the class of work of the subject and for brake shoes, such as are used in automohile and other work.

Fig. 5 gives the pressure and equivalent friction of cork on steel without luhrication, the cork heing inserted in cast iron discs or plated of sufficient thickness. As will be seen by inspecting the chart, the frictional resistance for one pair of plates without the cork inserts is about 80 pounds, if some 500 pounds pressure is applied. It will also be seen that 20 corks in a similar plate, under the same pressure, just ahout doubles the friction. This is equal to saying that the clutch ability is double. The same curve or chart shows a variety of possihilities, using various numbers of inserts, and it shows that the resistance is not in direct proportion to the number of inserts, considering a given pressure. The exact test as reported by Prof. John R. Nichols, of Harvard, is worthy of note, in that it gives more exact values than can be taken from a chart, although the latter affords a bird's-eye view of the whole performance, which would be lost in a tabulation.

TABLE OF PRESSURE AND FRICTION OF CORK INSERTS.

Load in Pounds.	PLATE NUMBERS USED IN THE TEST. No. 1-0 Cork.	No. 2-11 Cork.	No. 3-14 Cork.	No. 4-17 Cork.	No. 5-20 Cork.	No. 5-48 Cork.
	RESULTANT FRICTIONAL RESISTANCE IN POUNDS.					
50	7.5	17.5	17.5	17.5	17.5	17.5
100	15	35	35	35	35	35
150	22.5	53	53	53	53	53
200	30	63	70	70	70	70
250	38	70	86	88	88	88
300	45	77	94	105	105	105
350	53	85	101	117	122	123
400	60	92	109	125	131	141
450	68	99	117	133	139	159
500	75	106	124	141	148	176
550	83	113	132	149	156	...

The corks, one inch in diameter in holes (put in wet under pressure), were in plates of cast-iron five inches wide by ten inches long, and were smoothed down to a uniform hearing and pressed against a clean dry steel surface; the cast-iron plates were ¾ inch thick. The resistance offered was that of the plates with cork inserts considering the loads in pounds as given at a low speed. The consequences of a high velocity was not here taken into account. This is not necessary to consider in ascertaining the coefficient of friction, although it may be well to keep the difference in the mind's eye, against the time when the conditions to be met, in any given case, may introduce a variahle.

The question will naturally arise as to how much of the friction is due to cork, as against other materials, such as dissimilar metals in contact with each other. This is a matter that can he disposed of if tests of the dissimilar metals are taken. The following tabulation will show the results of metal to metal contact, under the same conditions and by the same authority, made at the same time and place. The test then should hear a close relation. It will, of course, be well to keep before the mind's eye, the fact that the tests are associated with the accuracy, naturally expected, of a laboratory of some pretensions.

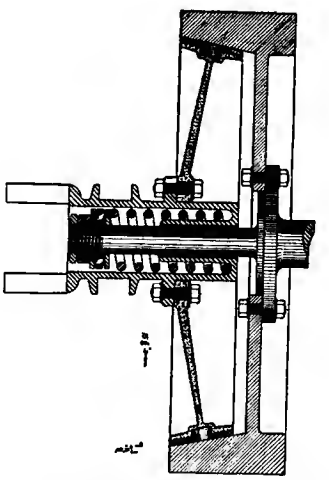


Fig. 4—Leather-faced cone clutch with cork inserts around the periphery of facings of the male member.

PRESSURE AND FRICTION METAL TO METAL CONTACT.

Load In Pounds.	Cast Iron on Cast Iron.	Cast Iron on Steel.	Bronze on Cast Iron.
	RESULTANT FRICTIONAL RESISTANCE IN POUNDS.		
50	8.1	7.5	7
100	16.2	15	14
150	24.3	22.5	21
200	32.4	30	28
250	40.5	38	35
300	48.6	45	42
350	56.7	53	49
400	64.8	60	56
450	72.9	68	63
500	81	75	70
550	89	83	77

The tests as above indicated for metal to metal contact were made on plates ten inches long hy five inches wide, with polished

urfaces, free of any foreign substance. The area of the plates hen was $10 \times 5 = 50$ sq. in., and for 500 pounds the pressure er square inch was:

$$P = \frac{500}{50} = 10 = \text{pounds per square inch.}$$

It is plain to be seen that differences in metals influence the riction, but it is equally plain that cork increases the friction ery greatly indeed, in comparison with metal to metal, no natter what metals are used. If the coefficient of friction is aken as the resistance divided by the pressure, then the coeffiient for bronze on cast iron may be taken as:

$$f = \frac{70}{500} = 0.14.$$

On the other hand, if cork inserts are used in the bronze lates on a basis of 20 per cent. cork surface, the coefficient of riction will be:

$$f = \frac{131}{500} = 0.262.$$

These relative results are of no great value, because they do ıot take into account practical conditions that cannot be avoided. In practice, oil will furnish a slippery surface in the case of the netal to metal contact, and unless the pressure is very high the slippery surface cannot be eliminated. On the other hand, the ork coefficient of friction does not seem to be affected by the ɔil film to any marked degree, and high pressures are not required to get rid of the slippery surface. The life of the members will be far longer if the pressure is low, and with cork the life can ɔe prolonged because the pressure *can be low*, even if oil does

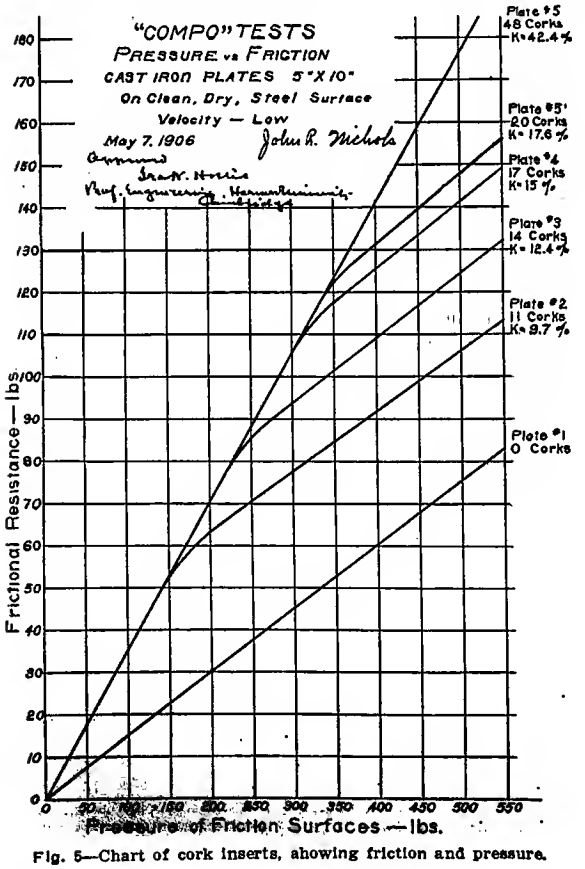


Fig. 5—Chart of cork inserts, showing friction and pressure.

get on to the surfaces, and in an automobile it is almost impossible to keep it off.

If, however, a clutch is designed for metal to metal contact, involving enormous pressures, it will not be very practical to insert cork as a final act of defense, because the conditions will not be the best for cork. Failures oftentimes result because the conditions that are necessary under certain circumstances are impressed into service under a change in the nature of the requirements. In the use of cork inserts there are two fundamental conditions to be taken into account, *i.e.*,

(*a*) When the pressure is not so high as to cause the metal to contact. The time when cork is in contact with metal.

(*b*) When the pressure is so great as to compress the cork enough to indicate metal to metal contact.

If the pressure is applied directly, as in the case of the loaded flat plate bearing upon a "platen," for the purpose of ascertaining the coefficient of friction, the resistance will be equal to the load in pounds, multiplied by the coefficient of friction in any given case, but if the pressure is increased enough to compress the cork and enable the metals to contact and to press on each other, there will be an added resistance which may be determined as follows:

$$R = f W + N A (K - a),$$

where R = resistance to motion in pounds;
W = total load on plate in pounds;
f = coefficient of friction of the metals used;
A = total area of the plate in square inches;
K = area of the cork in per cent. of A;
N = a constant, depending upon the nature of the materials and the prevailing conditions;
a = another constant.

This formula, devised by Prof. John R. Nichols, was extended and applied by him in the manner as follows:

The first modification of the formula is indicated as follows:

$$r = fw + N (K - a).$$

where r = the frictional resistance in pounds per square inch;
w = the pressure in pounds per square inch.

In a purely engineering sense, the formula is claimed to be accurate to a satisfactory degree, even above the critical point. The critical point, according to the authority stated, will occur as follows:

For cast iron:

When $W = 0.7\ A\ (K - 5.6)$
$w = 0.7\ (K - 5.6)$

For bronze:

When $W = 0.66\ A\ (K - 5.4)$
$w = 0.66\ (K - 5.4)$

According to the complex formulæ, the values of R and r may be found as follows:

For cast iron:

$$R = 0.16\ W + 0.118\ A\ (K - 5.6)$$
$$r = 0.16\ w + 0.118\ (K - 5.6)$$

For bronze:

$$R = 0.14\ W + 0.126\ A\ (K - 5.4)$$
$$r = 0.14\ w + 0.126\ (K - 5.4)$$

In all of the above cases the cork inserts are, of course, used in the cast iron, and in the bronze discs. The cork must be especially prepared to correspond with the quality known on the market as "Compo," as natural cork does not perform in quite the same way. A compact summary of the formulæ, taking into account the effect of a range of values, is given by the same author, as follows:

For cast iron (cork) on cast iron:

When W is less than $0.7\ A\ (K - 5.6)$
$R = 0.33\ W$
When W is more than $0.7\ A\ (K - 5.6)$
$R = 0.16\ W + 0.118\ A\ (K - 5.6)$

For bronze (cork) on cast iron:

When W is less than $0.66\ A\ (K - 5.4)$

$$R = 0.33\ W$$

When W is more than $0.66\ A\ (K - 5.4)$

$$R = 0.14\ W = 0.126\ A\ (K - 5.4)$$

For cast iron (cork) on steel:

The formulæ will be modified as follows:

$$R = 0.15\ W = 0.124\ A\ (K - 4.5)$$

$$r = 0.15\ w + 0.124\ (K - 4.5)$$

The critical point occurs when $W = 0.62\ A\ (K - 4.5)$ or $w = 0.62\ (K - 4.5)$.

The summary involving a range of values may be taken as follows:

For cast iron (cork) on steel:

When W is less than $0.62\ A\ (K - 4.5)$

$$R = 0.35\ W$$

When W is more tban $0.62\ A\ (K - 4.5)$

$$R = 0.15\ W + 0.126\ A\ (K - 4.5)$$

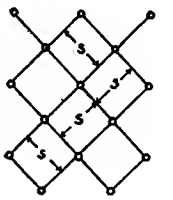
The above work has the sanction of Prof. Ira N. Hollis, also of Harvard, under whose supervision the tests were conducted. The deductions are much more complete and reasonable than usually can be attached to tests of this sort. They apply in this case to a marked degree, because they were conducted with a view to the automobile, whereas the tests generally available are of a nature not taking the automobile into account, or of so abstract a nature as not to directly apply. Prof. Nichols compiled a table for use in spacing cork inserts with a view to fixing upon the percentage of the total surface that the cork inserts should occupy, on a basis of quick and accurate results. The table is given here without modification. As will be observed, the cork inserts are pressed into holes, or sockets.

While the opportunity affords, it may be well to mention the fact tbat a new class of clutch and brake facings is now in use, *i.e.*, facings of asbestos, interwoven in a wire mesh in such a way as to afford the higher resistance of asbestos and the mechanical strength of wire. In a general way, it is quite possible that the action of these facings will be found to be with a critical point. In other words, they will probably be found to act differently under great pressure than will be the case with comparatively little pressure. In a twelve-hour non-stop run of a Chalmers-Detroit "30," over mountain roads, made by the author September 27, 1908, an opportunity was afforded to try out this class of facings on brakes, and it seemed to the author as if the initial friction (per pound of effort) was more pronounced than the later effort.

The results, on the whole, were very satisfactory, and the brakes were just as effective at the end of 240 miles of the hardest kind of work as they were on the start. The ordinary fabric would have given out long before the end of the run, as the author found by an actual run with another car over the same course. The Nichols formula would probably apply to the use of the asbestos products as well as to the cork inserts. subject to a correction of the constants of the formula. In the case of the asbestos (wire mesh) products, the pressure can be applied to an extent such as will compact the fiber enough to engender more nearly the metal to metal conditions than can be possible with the fabrics in which there is no metal binder. It is true, of course, that the percentage of metal will be small, relative to the total surface, but it is true as well that the percentage of cork, if increased beyond certain points, does not evolve a corresponding increase in results. In other words, there is no occasion for having more than a certain percentage of the total surface covered by the cork inserts.

When it comes to leather, red fiber and such materials, there is no compounding of the effect on critical point nor a change in the coefficient of friction before the change in structure due to charring as a result of a greater temperature than the materials will withstand. Wood chars at about 550 degrees C., and bursts into flame at about 600 degrees C. Leather will show effect of heat considerably sooner, and the coefficient of friction will change as soon as the leather suffers any change in character. When leather is subjected to the combined action of pressure and heat it loses its oily condition and becomes "as hard as a board."

D = ½"		D = ⅝"	D = ¾"	D = ⅞"	D = 1"
S	K%	K%	K%	K%	K%
1"	19.6%	31.7	44.2	60.	
1⅛"	15.5	24.3	35.	47.5	
1¼"	12.6	19.6	28.3	38.5	50.3
1⅜"	10.4	16.2	23.5	31.9	41.6
1½"	8.7	13.6	19.7	26.7	35.
1⅝"	7.5	11.6	16.8	22.8	29.8
1¾"	6.4	10.	14.5	19.6	25.7
1⅞"	5.6	8.7	12.6	17.2	22.4
2"	4.9	7.7	11.	15.	19.7
2⅛"	4.4	6.8	9.8	13.3	17.4
2¼"	3.9	6.1	8.8	11.9	15.6
2⅜"			7.9	10.7	14.
2½"			7.1	9.6	12.6
2⅝"				8.7	11.4
2¾"				8.	10.4
2⅞"				7.3	9.5
3"				6.7	8.7



John R. Nichols

"COMPO" TESTS
D = DIAM. OF SOCKETS
S = SPACING
K = % OF CORK TO TOTAL AREA

In this "crusty" condition leather is no longer suitable for the purpose, because it will no longer act in the same way. The leather will not cling to the same extent, or anything like it, and as a consequence the spring strong enough to do the work with the leather in its most receptive state will be too weak when the leather becomes hard, unyielding and glossed over. Red fiber has the ability of wood (it is wood) as long as it lasts. It does not last long enough, as a rule, in work of an exacting character. Wood has long been used in its natural state for frictions in brakes and clutches, and it seems to be more durable than the fiber. In automobile work wood cannot well be applied, because of the spinning tendency, if the friction member is of any great weight, at a distance from the axis of rotation.

Coefficient of Friction in the Abstract.

It was said the tests given in connection with the cork inserts were at a low speed, such as that due to drawing a flat plate over a smooth surface at a low speed. This coefficient does not, of necessity, show what would follow were the friction members caused to rotate at a high speed. Indeed, there are clutches that will not engage at a high speed, and the motor has to be slowed down. In general, it is conceded that the laws of friction will be different as the materials and the state in which they reside are varied. We have to consider, then, the laws as follows: (*a*) the friction of solids; (*b*) if the solids are unlubricated; (*c*) rolling friction; (*d*) fluid friction; (*e*) intermediate conditions.

Rolling friction may be stated as the force required to slide one body over a relating body, between which bodies rollers or spheres are interposed, in some cases to reduce the friction of rolling and in other instances to the detriment of the process, if, in the latter case, the resistance is desired on a basis of the maximum.

In ball-bearing work, the absence of friction is the quantity desired, whereas in clutch work the friction is sought. In clutch work, oil interposes a slippery surface and the coefficient of friction of the oil is the result. Oil then is not as a roller.

Sand or other hard foreign substances might be regarded as having the properties of rollers. A bearing (ball) in thrust might be as a friction member if the thrust is high enough to pinch the balls into wedge-shaped grooves. The law of rolling friction was well set forth by Henry Hess in a paper before the Society of Automobile Engineers, at the summer meeting of 1907, in Buffalo. This question will be of no further profit here because clutches are not as yet built of ball bearings in thrust to such an extent as to engender enough friction to enable them to perform the clutching function.

Friction of Rest.—The force required to start a body sliding is called the friction of rest (Kent). This phenomenon requires a little elucidation in order that it will be the better understood. When a member is at rest, the oil is squeezed out (because of the time allowed) and solid friction is the result. The friction of rest, then, is substantially "solid friction," and instantly the body is caused to rotate oil is picked up and thrust into the space, with the result that the friction of the slippery surface is the phenomenon to be noted. In the one case the coefficient of friction is that of solids on solids, and in the other instance it is the coefficient of friction of the lubricant.

The Friction of Solids.—(*a*) If the solids are of a fibrous nature the friction will probably decrease as the pressure increases. The friction will also decrease with increasing speed. The cork insert illustrates this set of conditions adequately, in that increasing pressure results in a critical point if the pressure is increased enough to bring about metal to metal contact. The curve of friction is maintained (as the formulæ show) because, as the friction of the cork tends to diminish under pressure, the friction of the metal to metal makes up for the deficit.

(*b*) The friction of non-fibrous materials will be proportional to the pressure only (within the limits of abrasion). Here, again, is evidence of the fact that a soft, yielding mass is of considerable advantage, if the mass is backed up in such a way as to allow of solid friction at the higher pressures. The reason for this lies in the fact that the soft yielding mass will afford the maximum resistance at the lower pressures and specds, while the later metal to metal contact will introduce the increasing resistance with increasing pressures and speeds.

(*c*) Increasing hardness is attended with decreasing resistance. This is adequately illustrated in leather facings when they become charred and glossy. Hardened steel discs also act in the same way. The spring pressure in a clutch will have to be greater for hardened steel on steel than it will have to be for bronze on steel or bronze on cast iron.

(*d*) The limit of abrasion is the limit of ability in clutch work at any rate, and this limit will increase with the hardness and toughness of the materials in contact. Hardened steel on steel, then, possesses the virtue of a high limit of abrasion, and can well sustain high pressures.

(*e*) If the surfaces are lubricated, it is the friction of the lubricant that must be taken into account up to the time the pressure is high enough to expel the lubricant.

Unlubricated Solid Friction.—The behavior of unlubricated solids, caused to slide upon each other, is such as to render the mistakes of designers fully accounted for. They sometimes use the coefficient of friction, as determined at a low speed, assuming that it will represent the friction that will obtain at a high speed. On the contrary, the unlubricated friction will decrease with increasing speeds, at first rapidly, thereafter less rapidly, and ultimately follow no man's law; in practice, at any rate. To be safe is to allow for a fall in the coefficient of friction in clutch work wherein the lower friction is a detriment, since friction is what is wanted. It is a well understood fact that bearings, for illustrations, run easier at higher speeds than they do at low speeds. This is true if they are lubricated or if they are not, up to a certain point.

Fluid Friction.—This is a phenomenon that should receive some consideration in clutch work because of the drag of the clutch, due to the fluid friction, in the class of clutches of the disc type in which the discs are submerged in oil. Fluid friction has recognized characteristics, as follows:

(*a*) The friction is in direct proportion to the wetted surfaces, hence in direct proportion to number of discs in clutch.

(*b*) So long as the oil stays between the plates (discs) the fluid friction is independent of the pressure.

(*c*) The friction is proportional to the square of the relative velocities at the higher speeds. The drag of the clutch will then increase enormously with the speed of the motor.

(*d*) If the speed is low, the friction will be proportional to the velocity.

(*e*) The friction will not be influenced by the generic nature of the metals in contact. This is to say, as long as it is fluid friction it matters not of what metal the discs may be.

(*f*) The degree of smoothness will have some bearing, but clutch discs are never rough enough to have any influence on the friction of the fluid. Were they put in rough they would promptly wear smooth.

(*g*) The resistance (drag of the clutch) will be proportional to the density of the fluid (oil), and the viscosity of the fluid will also have a bearing on the performance.

(*h*) The unctuousness of the fluid will have bearing upon the performance of the clutch, as is adequately proven from the fact that light grades of cylinder oil will not act well until tbey are charged with their own weight, approximately, of kerosene. The unctuousness of kerosene is almost a minus quantity, while the light cylinder oil is of a high value.

(*i*) The mobility of the oil has a considerable bearing on the performance of the clutch from the point of view of drag. If the oil falls off in density as the temperature increases, it is a mobile product and not so desirable for a clutch, for the reason that the density of the oil will be very marked when the temperature is very low, as it would be in winter.

Some Coefficients of Friction.

Leather: (Gen. Morin).

(*a*) On clean, dry, smooth metal	0.56
(*b*) On wet metal	0.36
(*c*) On greasy metal	0.23
(*d*) On oily metal	0.15
*(*e*) Dry, compressed, charred leather; on greasy, polished metal	0.08

*The effect of compressing and of the dry polished surface is a condition peculiar to the automobile clutch.

As will be observed, leather furnishes all the conditions between the most satisfactory possible, when it is new and well applied, to the most abject failure, from the clutch point of view. No motorist of experience has escaped the two extremes.

The question of the applied pressure is one that probably belongs to lever systems, in so far as the several modes of application are concerned. In the main, however, it does not seem desirable to separate the subjects. The foot pressure should not be so little as to render it impossible to use the pedal as a foot rest. On the other hand, the pressure should not be so great as to make it tiresome to press the pedal and hold it down. Forty pounds should be about the right pressure, with the clutch open and the initial pressure should, and would, be less.

(To be continued)

THIS IS WONDERFUL, IF IT IS TRUE.

This description is from a Chicago daily paper. It is doubtful if even the maker of the car could recognize it: "The transmission is on the floating type rear axle, and a drop frame is used, with herringbone gears for quietness. There is an 18-inch steering wheel, the ball-bearing knuckle making it exceedingly easy to steer. There is a fan on the flywheel and four brakes. We use the three-point motor suspension, aluminum boods and fenders and geared lubricator. The body is of hand-hammered aluminum and there is seating capacity for six people. Tbis gives a car without noise, jar or vibration and with speeds of from five to fifty miles on the high gear."

LETTERS INTERESTING AND INSTRUCTIVE

CESSIVE FUEL AND OIL CONSUMPTION.

THE AUTOMOBILE:

91.]—Your department of "Letters Interesting and Instruc- leads me to write the following: I have an eighteen-horse- runabout with rumble seat, equipped with a Schebler car- r and a ten-gallon gasoline tank. There is absolutely noth- rong with the running of the car, but the amount of lubri- oil and of gasoline used seems to me rather excessive. On aturday I made a demonstrating trial over a known course nty miles. At the end of the run I had used one quart and int of lubricating oil. Turning round, I made the run di- back to the starting place, a second twenty miles, and at the this I had again used a full quart and pint of oil. In noting moke from the exhaust at all times during the run, there wae ess of this oil being burned in the cylinders; the engine at e misfired, until at the end of about fifteen miles, when the plug of the right-hand cylinder was found to be badly . After changing the plug the balance of the run of twenty- iles was made with no trouble whatever.

ng the trip of forty miles six gallons of gasoline were con- and yet at no time was there a single misfire in the ex- or puffing in the carbureter, giving any indication of either h or too weak mixture. There ie one fact that seems hard lain, and that is that the oil thrown off by the flywheel itself through the hinges and openings of the hood and along enings between the hood and the frame.

you give me any information that will prove of value in a ke this? W. L. H.

ville Center, L. I.

sooted spark plug indicates a slight excess of oil fed to linders, but the principal loss is evidently by leakage, as by the oil forcing itself through the joints in the hood. ace for oil is inside the engine, not outside, and when it to appear on the hood or to drip from underneath when is standing still, it is a safe indication that there is some- wrong. The principal source of loss will probably be to be around the bearings of the crankshaft and the gear- Some sort of oil-retaining device ought to be fitted on bearings, and these may require cleaning or fresh packing. car has been in use long, the bearings themselves may be nd require adjustment or even replacement. In case the have neglected to provide for any oil-retainer in the and it is found impossible to make the bearings tight oper adjustment, you may be able to fit some device your- serve the purpose.

gasoline consumption of a gallon for every 6 2-3 miles inly unreasonable for such a light car, and it seems im- that that amount could be passing through the cylinders giving some unpleasant indication of its presence. We uggest that you verify the measurements carefully, mak- that no gasoline is drawn from the tank for cleaning or rposes during the test, and that there are no leaks.

AUTOISTS LIKE TO BE COMFORTABLE?

THE AUTOMOBILE:

]—Can you give me information about the public or owners automobiles? Are they looking for more comfort as to et? Say, for instance, riding for a few hours or a whole nped up in the car you would like to rest your feet or change ition. From sitting to a lying-down position would greatly the monotony. Do you think a foot reet would be in de- at would not take any room from the car, only when in have an article that I want to bring before the public, want to patent, but am a little backward. Can you give encouragement? J. P. HOPPA.

ukee, Wis.

ave no doubt that the automobiling public in general gladly welcome any device which would increase their provided the price were no more than commensurate increased enjoyment. But there are already a number rests on the market which fold up when not in use, and rs next year will include them in their regular equip- The lying down device, however, hardly seems likely to the comfort of traveling over ordinary roads.

SOME QUERIES ABOUT THE TRANSMISSION.

Editor THE AUTOMOBILE:

[1,593.]—I would like to ask you several questions and would be much obliged to you for answering them:

1. How is the transmission employed on the Cameron car constructed, and how does it work?

2. Could you tell me what advances have been made toward eliminating the differential gear? What devices have proved successful?

3. Would you explain the construction and operation of a gas turbine? Are there any you may know of that could be seen in operation? A. M. W.

New York City.

1. The change-speed gear-set (popularly misnamed the "transmission," which properly includes the entire drive from the motor to the rear wheels) of the Cameron car consists of a single short shaft carrying three spur gears, to give the three forward speeds, and the large driving bevel. This large bevel meshes with the bevel pinion on the end of the propeller shaft, as is customary. The short shaft in question is placed transversely, or parallel to the rear axle, and is carried on a heavy yoke that may be rocked up and down, a large spur gear being bolted to the case of the differential. The entire gear-set, bevel drive and differential, are contained in one small housing at the rear axle. In order to obtain any one of the forward speeds, the pinions in question are shifted along the short shaft mentioned, until the one representing the speed desired is exactly opposite the large spur gear on the differential. The shaft is then rocked downward, engaging the two gears face to face, and is locked in place, the entire operation being accomplished by a simple movement of the side lever. To go from one speed to another the lever is manipulated in the same manner, the operation consisting of unlocking the speed then in, shifting the shaft forward out of engagement, sliding the new pinion into line and again locking the gears together—something that sounds complicated in a description, but is quite the reverse in practice. The great advantage of this gear-set is that the pinions are engaged face to face, making no side contact, as in the ordinary form of sliding gear. The reverse is obtained by an intermediate pinion that is only thrown into engagement for this purpose. In coasting with the gears in neutral, the rear axle turns entirely free, and if the clutch is out, the propeller shaft and all the gears are idle as well.

2. There have been a great many attempts to eliminate the differential, but so far as our knowledge goes, the only one that has actually survived and been applied to any extent, is known as the Hedgeland axle, which is an American invention and is made in this country. Its principle is that of permitting the outer wheel, which has the greater distance to cover in traversing a curve, to run free, or ahead of the inner wheel, which, for the time being, transmits all the power.

3. To our knowledge the only gas turbines in actual operation are in use in France. The principle consists of the utilization of the pressure generated by burning a mixture of gas and air in a retort, against the blades of the turbine rotor in much the same manner as steam is employed, the modifications necessary being those required to handle the gases at the extremely high temperatures involved. A detailed description of this turbine may be found in *Cassier's Magazine* for January, 1907.

POSSIBLE CAUSE OF CARBURETER POPPING.

Editor THE AUTOMOBILE:

[1,594.]—In regard to letter No. 1,578 in the issue of October 8, Mr. Hutchings may find that his trouble is due to scale of metallic hardness having been formed on the valve stems and their bearings. In starting the engine under this condition, the camshaft speed is so low that the full force of the valve springs cannot be used to seat the valves, thereby allowing them to stick by reason of the scale. At a higher speed, however, the cams get from under the valve stems quickly enough to allow the seating of the valves in spite of the scale. The popping in the carbureter

ould thus be due to leaky inlet valves. To remedy this, remove ne valves and scrape off the scale, both from the valve stems nd from their bushings. I think this will remedy the trouble.
Ithaca, N. Y. CHARLES E. YATES.

We do not quite follow your reasoning with respect to the ull force of the valve springs not being available to seat them. t is evident that the springs exert the same force irrespective f the speed of the camshaft. If the valve stems really were ticking, the missing or popping would be more likely to occur t high speeds than when running slowly, owing to the valve not aving sufficient time to return to its seat. In fact, we think hat if Mr. Hutchings has not already discovered the source of is trouble, he would do well to make sure that the inlet valve tems are not too loose, as leakage of air through the guides on he suction stroke would have the effect he described.

MORE ABOUT PERCENTAGE OF DIFFERENCE.

Editor THE AUTOMOBILE:

[I,595.]—I am sorry we still disagree, but since you say I have ide-stepped the question I will try to return to it. We began alking about the vibration of a single-cylinder motor of a given ower and comparing it with motors of like power and more ylinders. I explained that two cylinders would give impulses of alf the power and twice as often, so that the vibration effect would be but one-fourth that of the single cylinder. Likewise hat three cylinders gave impulses of one-third the power and hree times as often with one-ninth the vibratory effect, while our cylinders gave one-sixteenth the vibratory effect given by he single cylinder of the same power. So the fractions refer not o each other, but to that single-cylinder impulse with which ve started.

In the wooly West where I went to school, every fraction presupposed a unit. And that unit had one hundred per cent., nine ninths and sixteen sixteenths. It is preposterous to assume one of the three fractions used as the unit base of comparisons. But if his is to be done, why select the one-ninth? The one-fourth mentioned is larger and more important. Or why not the one-sixtesnth? The use of this as a unit or base for comparison would give a perentage difference of 78. But everybody knows that the multiplication of cylinders rapidly reduces the vibration, and it would be he height of absurdity to tell a user that there is 78 per cent. lifference between cars of two and four cylinders in the matter of vibration, for his own feelings tell him more reliably. Your answer to C. W. M. rightly indicates very little difference. My hanke to "Cincinnati." His brand of arithmetic is all right.

I pride myself that in my arithmetic, as in other matters, I ry to stick to the plainest English of which I am capable, and am disappointed that I did not make it clear that the public had been offered side-entrance surreys for years before the rearentrance French freak ever was seen. They were offered wood wheels before they bought wire ones. They were offered gasoline rigs that ran before they swallowed the dinky steam toys and sickened so badly on steam that the really fine steamers now on the market are regarded with suspicion. Magneto ignition was an accomplished fact in America ten years ago, but the public are really just beginning to find it out. And the list can be extended much farther.

The side door is an imported nuisance. It was designed to shut the high-born lady in from the vulgar crowd, and will always be used by those who think they must be exclusive, but watch the growth of the practical surrey without the doors. Of course the doors serve a useful purpose in that the tires and repairs so frequently piled in the rear can not fall out, but rigs are getting better every year, so this need is passing. The enclosed box stall is a good dust receptacle, and this alone is enough to condemn it. In properly designed rigs the rear seat can ride nearly as easily as the front and with no more need of doors to keep the riders from falling out. I again say that on subjects new to it the public opinion is usually wrong. Watch the light car with light motor displace the heavy one. CHAS. E. DURYEA.

Reading, Pa.

We are glad that you have again stated the subject of the discussion, as it had dropped completely out of sight. In comparing the vibration of a three and a four cylinder motor, if the vibration is assumed to be in the proportion of one-ninth to one-sixteenth, there is a difference of 43.78 per cent. between the two. We have already demonstrated the way in which this result is obtained, and if you have any doubts as to its correctness you had better consult some fourth or fifth year school arithmetic. But we do not admit the correctness of your method of stating the proportionate vibration. Assuming that it is correct for the cylinders alone, which is doubtful, you make no allowance at all for the flywheel. Of course it would be preposperous to say that there is 78 per cent. difference between the vibration of a two-cylinder and a four-cylinder motor, no matter what brand of arithmetic was used, because all such motors have a flywheel of suitable size. The vibration of a motor depends on many things besides the number of its cylinders.

As to the poor, much-abused public, it may have shown its wisdom in some of the very cases you mention, by buying cars in which the quality of the material and workmanship was not subordinated to a few talking points. And side doors will keep out a good many cold drafts this winter.

A PLEA FOR SIMPLIFYING AND STANDARDIZING.

Editor THE AUTOMOBILE:

[I,596.]—In all the hill-climbing contests which have come under my notice the engine ratings have been based on the piston displacement, and invariably the volume is expressed in cubic inches.

This is one of the mathematical absurdities that have descended through generations and have produced mental habits hard to break. Always we think of volumes as having rectangular boundary lines, and we must convert all forms, however regular and common they may be, to the cubic form before comparing them.

So also we think of surfaces and sections as squares, hence our units of area are always square, and we go on converting the value of circles and cylinders and spheres into terms of squares and cubes, for each equation, requiring the use of a long decimal multiplier or divider, wearing out gray matter, better devoted to more useful service.

When we get away from this worship of the rectangular god, we are free to set up a new and more convenient rule for comparing volumes and areas, viz.:

When volumes or areas of like form are to be compared with each other, the unit of measurement should be of the same form.

The electrical people have adopted the "circular mil" as the unit of sectional area for wire, etc., which is much more convenient than a square mil, for it requires only that the diameter in .001 inch be multiplied by itself to give the sectional area, and the diameter in .001 inch of a wire of any desired area expressed in circular mills is the square root of the area.

d^2 = area, is a much shorter equation than d^2, 7854 = area, or nR^2 = area, and for purposes of comparison a much better one.

Why should not the engine builders and users adopt the cylindrical inch as the unit of piston displacement and cylinder capacity. Then the equation for displacement would be d^2L = volume, the proportion would remain the same as if reduced to cubic inches.

Thus the displacement of a cylinder 4" diameter with 6" stroke = 96 cylindrical inches or 75.3984 cubic inches.

The displacement of a 6" cylinder with 4" stroke = 144 cylindrical inches or 113.0976 cubic inches.

96:144::75.3984:113.0976. You see, it is just the same, and if you took your choice without prejudice you would take the shorter one expressed in whole numbers.

It is as easy to convert the volume of irregular cavities such as the compression space into cylindrical units as cubic units, the ratio between them being of course 1 to .7854.

The sectional area and volume of intake and exhaust pipes, the area of any circular opening such as valve ports could bets be expressed in circular and cylindrical inches.

Simple and easy understood methods of comparing one engine with another would be a boon to the automobile user, who is not always an engineer; neither has he a slide rule with him all the time, but he could readily multiply the diameter by itself and that product by the length of stroke. The calculation usually involves whole numbers or simple fractions, and could be done mentally.

There should also be a standard of speed at which an engine is rated, or rather there should be two points at which a variable speed engine such as used in an automobile should be rated.

Various compressions and valve timing may give an engine a high power at high speeds at the sacrifice of power at low speed, and vice versa; so it is hardly fair to compare two engines of the same bore and stroke at only one speed. Hence a rating should be given at a point between 400 and 600 r.p.m. (the normal running speed) and between 1,200 and 1,600 r.p.m. (the point of greatest output).

The power curve in most engines rated at from 30 to 50 horsepower is a rising one up to from 1,200 to 1,600 r.p.m. At some point in this range, the inertia and other losses which are rapidly rising compensate any increased power due to speed, the curve flattens out and shortly begins to drop.

Why not establish these extreme points in some engineers' convention as a standard of speed for power rating, publish it widely, and thus "put a crimp" in the practice of trading in ambiguities and fairy tales. FREDERICK PURDY.

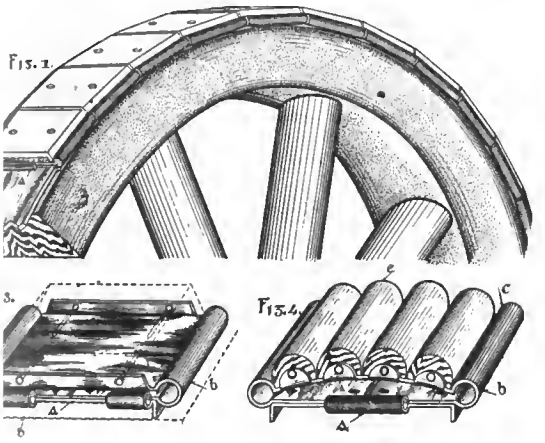
New York City.

TION SPRING WHEEL FOR POWER VEHICLES.

ır THE AUTOMOBILE:

97.]—I have designed a new tire for heavy commercial ve-
, and I wish to submit it to your judgment for criticism. I
ully aware of the great virtues of the pneumatic tire, and am
oolishly attempting any improvement in that direction. The
matic tire cannot he even approached. It is peerless, and the
gold of the tire industry.

tire is especially intended to eupplant the solid tire of pure
ər. I think it will give just as good service, last much longer,



From the Patent Drawinge of Mr. O'Meara's New Tire.

ost less. The solid tire of pure ruhher gives fair service under
loads while it lasts, hut its life is indeed short under an unful load, whether it he a continuous or a sectional construc-

My aim is to design a mechanically constructed tire that afford some resiliency. Something that will hold fast to the hery of the wheel of a truck making 20 miles an hour.

ompanying my letter you will find a sketch of the tire in refe, also a photograph of a model. In the sketch ie shown a nuous chain of douhle flat metallio springs, shod with hlocks k, secured thereto with wire nails, and forming an annular of spring sections removahly secured to the felloe of an ory artillery wheel. These sections can he removed individually, nay be secured to all compression spoke wheels of ordinary ruction without alteration. It is a formidable spring, and properly designed and mounted cannot be disturhed. It is nely low, and hecause of ite form can he easily eecured to heel and becomes a part thereof. It is a truee in itself, of nse reeistance for its weight, and effectually unites even a ection of wood to the wheel. It is formed of sheet steel, and, without guides, pivots, sockets, etc., which cause friction rouble, it is noiseless.

s extremely hard to get anything in a sectional type of tire will stay fast on a power-driven wheel. Yet I believe that ng-looked-for mechanical tire will be sectional. Some who nad experience in spring wheels have finally come to the con- n that a plain block of wood is the only thing that can stay wheel. But a plate is necessary, and the epring shown on heel being, properly considered, a cushion plate, a section of mounted thereon, is evcn hetter eecured than when attached y to the rigid felloe of kindred material, because the spring stion, having a slight yield and a slight swaying lateral movill neutralize the most severe shocks, while the sections will n any weight that the wheel can.

design of spring shown in Fig. 4 is capahle of considerahle and it must be shod with two or more sections instead of one block. The circular sides will not shear. They will bear times the weight that the spring can at the center, and, not rigid, they will neither rock the spring nor collapse. These sections should be diagonal and rest diagonally on the wheel, llowing two or more sections to touch the road at once and as many independent yielding surfaces, hesides giving the hetter traction and ahility to shed dirt.

importance of euccessfully covering this type of tire ie than any other consideration. These springs must he tight. The model that I have made is covered with sheep- This model is intended for lighter vehicles than motor trucks. vering is a continuoue plain piece of leather drawn over the , which are too close to preeent any edges to he feared. ood portions are twin supplementary rims adjusted from side. I do not fully approve of all the details in the con- on of the very wheels shown, but my principal ohject is to prove the adaptability of this spring as the germ of a epring wheel when shod with a block of wood or more suitahle material. The cushion plate and the hlock of wood are both practical. I helieve it to he the only spring that can be poesihly considered for the purpose. These are my own reflections. Now, may I ask what are yours?

DENIS H. O'MEARA.

Hamilton, O.

PISTONS, MAGNETOS AND STORAGE BATTERIES.

Editor THE AUTOMOBILE:

[1,598.]—What is the procese for figuring the diameter of piston rings for any size pistons? What is the composition of the cemsnt used for celluloid storage hattery cases? How may the armature of a magneto he tested for a ruptured wire? What is the prohable trouhle with a high-tension magneto when it delivers a feeble spark direct, and the magnets seem very strong—magneto perfectly clean? How many thousandths of an inch smaller ehould the piston he than the cylinder?

L. T. S.

It is impossible to give any formula offhand for the diameters of pistons or piston rings, and even if it were, such formulæ would be of very little practical use. The smallness of the quantities involved makes accurate figuring useless, as it soon exceeds the limit of accuracy of the tools. Most engineers go entirely by "rule of thumb." A good cement for celluloid is composed as follows: 25 parts shellac, 25 parts spirits of camphor, 100 parts 90 per cent. alcohol; apply warm. Another consists of fine celluloid shavings dissolved in 90 per cent. alcohol. The best way to test your magneto armature for a ruptured wire would be to substitute a new armature known to be in good condition, and observe the results. A magneto is a very delicate thing to experiment with, and when any trouble arises that cannot be cured by cleaning and adjusting the contacts, the best course is to ship it back to the factory immediately.

REFINISHING THE STEERING COLUMN.

Editor THE AUTOMOBILE:

[1,599.]—The steering column of my automobile is of steel tuhing and is hraes plated. The plating has worn off eo much that the post rusts, and this is difficult to remove. Does "The Automobile" know of any paint I could use to cover the column, and must this he specially applied? Or would an enamel he of eervice?

Milwaukee, Wis. A. S. H.

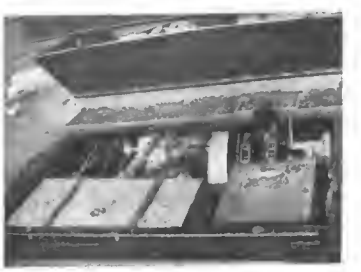
Many cars now have the steering column, as well as the levers and the radiator, painted to match the body work of the car, and this practice seems an improvement from every standpoint. No special paint is necessary. Enamel might serve the purpose.

INSTALLING 10-H. P. MOTOR IN AN OLD MODEL.

Editor THE AUTOMOBILE:

[1,600.]—Some time ago I promised to let you know the result of an attempt to install a two-cylinder 10-horsepower motor in a curved-dash Olds runabout 1903 model. It certainly was a decided success, and A. H. Phelps, a mechanical engineer, who owns the car, now has a fine working little runabout. Though this is a very mountainous country, the car takes some very stiff grades on high with perfect ease, and can make about 30 miles an hour on the level. Mr. Phelps did the job of making the change himeelf.

Mr. Phelps in His Reconstructed Olde.



Showing How the New Power Plant Wae Neatly Installed.

By having a transmission shaft made to bolt to the flywheel, he used the old transmission, and by making some slight changes he also used the old levers and connections. The two photographs which I send for illustrations show the complete car with Mr. Phelps at the lever, and the other shows where the engine is located in the chassis.

E. R. WELLS.

Keene Valley, N. Y.

CONCERNING THE SILENT KNIGHT MOTOR

By THOS. J. FAY.

'HE invasion of Europe by Americans and American devices is nothing new. The Silent Knight motor takes rank ong the invaders, although it cannot be said the same motor much of a swath in America during the time of its trial e. The reasons why this motor failed to win a place for itself ing the time of its sojourn in America, beginning some six rs ago, could be traced to environment more than to the ure on the part of the motor to perform.

Iad the motor been well constructed and properly applied, it bably would have failed to make its mark at that time, because period was one devoted for the most part to the types of tors as they then emanated from the factories of France and many. At that time cars were strictly luxuries and the fad s for a foreign "Red Devil."

'hat the Silent Knight motor failed to impress the designers America (not to mention users of cars), is an assured fact, l it is now that we learn of the taking up of this motor by the imler company and by the Minerva people also.

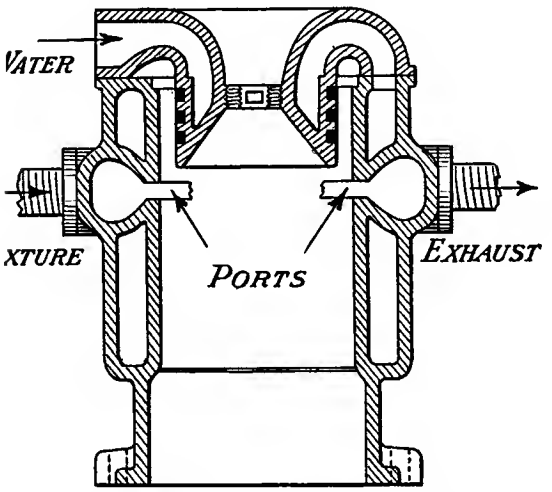


Fig. 1.—Cross-section of a Silsnt Knight Cylinder.

At all events, the motor in question is now being exploited by Daimler company, and it is reported generally that they have ndoned the conventional four-cylinder motor—on which they ays placed such great reliance—and more completely offer the antages of the new motor in their future cars.

'his motor as they are now turning it out, according to the st devices, differs only in minor particulars from the same tor, as we (in America) were accustomed to know it first ne six years ago. Presumably, the new product will reflect advances in modes of construction and in the quality of terials entering into the respective parts.

t would be untimely to say much by way of bragging about Silent Knight as an American product by an American, now t it has to be transplanted to make it grow. While we were sing the rainbow, by way of foreign designs, to the utter glect of "nuggets" lying under our feet, we were paving the y to our more or less future undoing, if **what** the Daimler npany says is true.

f the "beggar" proves to be rich, it will cause us a pang or o, and, having thus ruthlessly driven him away from our or, we will have small claim to the future glory that naturally ivitates towards merit. If, on the other hand, the Silent light motor fails to keep step with the claims now being de for it, we may pat ourselves on the back and flatter ourves that we know a ripe watermelon when we see it.

This motor in relation to which our English cousins are now making such a stir about will be remembered as one of the class formerly said to be valveless. The appellation "valveless" was a misnomer, on the ground that the motor has more valves about it than any other type of motor yet offered to the patient public, but the valves are not of the "poppet" genera.

Appellation "Valveless" Is a Misnomer.

The valves in the motor in question are of the well-known piston type, as they have long been known in steam engineering. True, the valves in this motor are not located in a valve-chamber, as they are in steam engines, but instead the valves are by way of concentric sleeves, concentric with the piston proper. There are two of these valve sleeves, one of which is next to the piston of the motor, and the other of which is next the cylinder wall. The valve so constituted is actuated by means of a linkage to an eccentric (one for each cylinder), just as in steam engines. The admission and exhaust ports are properly located in the respective sleeves and in the cylinder wall, in such a way as to afford the functions requisite to a four-cycle motor.

The whole arrangement is such as to afford timing of the openings as follows:

1. The inlet port opens before the exhaust port closes.
2. The exhaust port is covered by ths outer slesve.
3. On the inlst side the port is at full open, sincs ths slot in ths inner and the outer slesves ars in juxtapoeition.
4. Ths inlet port is still open at the beginning of the compression stroks.
5. The inlet closes before the compression exceeds the inertia component of the incoming mixture.
6. All ports remain clossd during the compistion of the compression stroke.
7. Ignition is with all ports closed.
8. Expansion of ths chargs with all parts closed.
9. Exhaust ports begin opening just before the snd of ths expansion stroke.
10. Exhauet ports wids open when ths pistons reach lower dead center.
11. Exhaust port remains open until beginning of suction stroke and until the inlet port opsns. (See Fig. 1.)

With valve timing such as would satisfy the conditions of operation of a conventional (poppet valve) motor. The time of escape of the exhaust is quite as long as would be the case with the conventional motor, and the incoming mixture is afforded the same time as in the conventional motor.

In these relations, then, the Knight motor would be quite up to the usual expectations, were a conventional motor in the mind's eye. On the other hand, the conditions would be no better.

Actual Gas Velocity May Be More.

There is a chance that the actual gas velocity will be more in the Knight motor for a given flow of gas on cubic inches, since the piston valves have to slide to a full opening; whereas, the poppet valves raise to full opening on all edges at the same instant and quickly, due to the shape and angular velocity of the cams placed to actuate the valve tappets.

As regards leakage, there is this to say. The poppet valves are usually tight and more to the point; any novice can render them tight if they become leaky. The Knight concentric sleeves are within the cylinders (out of sight), subjected to the temperatures prevailing and stressed by pressure of the piston in each cylinder.

Cylinders go out of round as a consequence of variations in pressure and of temperature, even if they are symmetrical in shape and of even texture. If they are symmetrical in shape it cannot be said of them that they are of even texture, and at best there will be three remaining conditions tending to make them go out of round.

If the cylinders do deform (and they do), the sleeves within the cylinders must deform also, or, what is worse, stick. If the sleeves resist deformation, they will cause oiling troubles, and

noise will be one of the products. The facilities for oiling are by the splash system, and it is not quite apparent as to how the oil will provide a slippery coat over all surfaces on both sides of the two sleeves and on the rubbing surface of the pistons as well.

Some of the surfaces are quite well concealed, and oil will be resisted in its search for a dry surface to cling to, especially

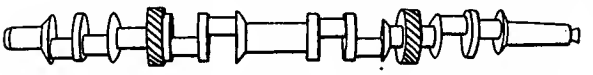


Fig. 2.—Complicated Shaft Required to Operate the Sleeves.

since the conditions are such that the oil must reach its place of lodgment in short time, or be sucked out again, ere it has a chance to reach its goal. Oiling troubles then would be more prone to attach to this type of motor.

Referring to Fig. 1, it is to note that the cylinder head is separable and that it protrudes down into the cylinder for some distance. It is water-jacketed, to be sure, but, as far back as twelve years ago, it was found (when this scheme was tried) that the water ports served as lodgments for foreign substance from the water and that it was best to eliminate the separable water jacketed head on that acount.

Claims Advantage for Separable Head.

The Daimler company claims there is an advantage in having a separable head, although they fail to call attention to the fact that the construction compels them to have it. Be this as it may, the separable water-jacketed head will be cooled by the water, if the same is not shunted away from the head by lodgments of foreign substances.

It has been found that holding bolts for separable heads are wont to stretch for two reasons; i.e., (*a*) because of the tension, and (*b*) because of the heat changes. These disadvantages are more than a theory without a practice to support it, and it was largely on this account that automobile builders expended thousands of dollars in devising and building special boring machines to finish cylinders with a blind end.

As will be observed, by again referring to Fig. 1, the head is provided with packing rings, in order to pack against the inner shell of the valve system. These rings are made in the same way as piston (bull) rings, and should work just as well, barring one circumstance. If piston rings stick in the slots provided to nest them, they fail to serve their purpose, and they will stick if they are not lubricated, or if they soot up. They are kept from sooting up by the movement of the piston, but, in the case of the rings for the head, they do not move, and they will soot up, and, as a consequence, they will not remain tight. If they do not, it seems a waste of space to say what will happen. If we take into account the ill effect of so small a leak in a cylinder, such as follows if a spark plug is not snug, this small leak, in comparison with the leak around packing rings if they do not nest properly, is as a pea to a plum.

Knight Has a Pretentious Eccentric Shaft.

The Knight motor has a very pretentious eccentric shaft, as will be observed by inspecting Fig. 2; a shaft, in fact, that takes on the characteristics of a crankshaft, and there are none of us who feel called upon to hanker after a collection of crankshafts in any automobile we ourselves have to pay for, drive, or keep in good repair.

This is not to say that the Knight eccentric shaft will fail to work, but it is to say that there can be no valid claim of superiority over a conventional camshaft of fair design and construction. In a steam engine, every engineer knows that the eccentric is very prone to run hot. Why should the eccentric behave any better because its geographical position is somewhat altered?

The reports of the Knight motor include a statement that the compression can be increased on the ground of superior cooling and because the poppet valves are eliminated. It is said, nevertheless, that the Daimler company will stick to the conventional compression (about 80 pounds per square inch), but it will be well to give this matter a moment's thought, for fear the claim of advantage by way of increased compression may be with the idea of concealing the facts in the case. In the first place, the cylinder head is no better provided with a water-jacket than is the case with motors of the conventional sort; indeed, it is possible to see how the reverse might be true, as before intimated. In the second place, the piston is not water-jacketed, and it is the piston that does the mischief in all motors, because a zone on the piston head reaches the highest temperature in all cases. In the third place, the cylinder walls in the Knight motor are not nearly so well protected by water-jacketing as are the walls in motors of the conventional sort, because the concentric valve shells intervene.

It is a well-known fact that two parts of metal in contact with each other will not transmit heat nearly so well as a solid wall of the same combined thickness. It will not be necessary to dig up proof of this contention, because every schoolboy knows it. In this case the conditions are even worse, in that the concentric shells must reciprocate and must have a bearing fit inside of cylinders that expand from 15/100 to 30/1000 of an inch, so that there must be an actual clearance equal to from 15 to 30 thicknesses of the oil film to prevent sticking of the members due to expansion from heat changes.

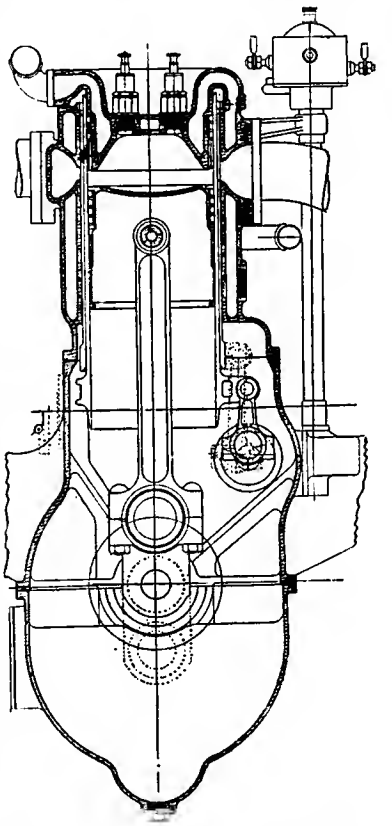
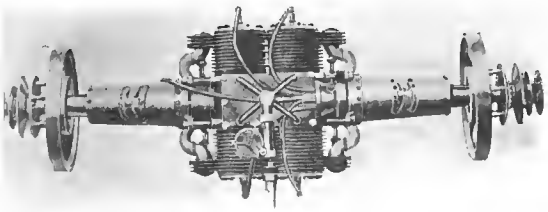


Fig. 3.—Cross-section Silent Knight Motor.

It has been pointed out that the valve system in the Knight motor, instead of the valveless product as originally claimed, is complex and extensive. From this point of view then, there is not a whit of simplicity. Take the question of packing rings. In a conventional motor the packing rings are limited to the pistons, while in the Knight motor there are two sets of these rings. The second set, as before stated, packs the separable head as it bears against the inner shell of the valve system. (See Fig. 3.) In this we see no migration towards the goal of simplicity, and in this we are dealing with packing rings, long regarded as fragile and prone to fail in service. Let us have another look at Fig. 2, and while thus devoting our time, remember that the double linkage required to actuate the two shells of the valve system is something to ponder over.

Dry batteries become inefficient in time, if they are near any source of heat. In such cases, to drill a hole in the sealing compound and spill some water in through the hole is a simple expedient. Seal up the hole, to prevent evaporation; give the cells a short interval of rest, and they will then be ready for service.

IRECT transmission of power from the motor shaft to the wheels without intermediate gears is accomplished the first time in the history of the automobile in- try." The foregoing statement precedes the announcement of Holsman Automobile Company, of Chicago, in placing upon market its new model, Holsman "Gentleman's Automobile." a pioneer in the construction of what is known as the auto- gy type, the Holsman Company is well qualified to speak, and special and distinctive feature that characterize the company's ducts, and which are set forth in a neatly printed and illus- ted booklet, make interesting reading for the thoughtful buyer. One of the most noticeable features of the new model is the tor, which is an air-cooled, four-cylinder, four-cycle type, ed at 26 horsepower. In the illustration below, the motor, nplete, with carbureter, twin mufflers, oiling device, ignition



Unit Power Plant and Drive of the 1909 Holsman.

paratus and transmission for both low and high gear is shown, ving an idea of the compactness of the power plant. In the spension of this unit power plant great care has been used at no vibration of the motor is communicated to the body of e vehicle, and is so attached that the whole machinery may be uickly removed from the frame for repairs or even for transfer another Holsman. Throughout the whole machine, either yatt flexible roller bearings or radial ball bearings are used, and the illustration at the bottom of the second column is shown ie rigid connection between two pistons with the roller bearings place, and two of the three 5-inch radial ball bearings used.

There are no gears in the motor, the inlet valves being auto- iatic and the exhaust valves are operated from the shaft without ny intermediate appliances, such as gears, push-rods, etc. The ubrication has been accomplished in a very novel way without ie use of an oil pump or similar attachment, by dissolving the equisite amount of oil in the gasoline, whence it is carried in ie form of a vapor directly to the parts where it is most needed. No oil adjustment is considered necessary, as the proper quantity f oil is always in proportion to the work required of the motor, or as the work increases the amount of the charge has a corre- ponding increase with its quota of oil.

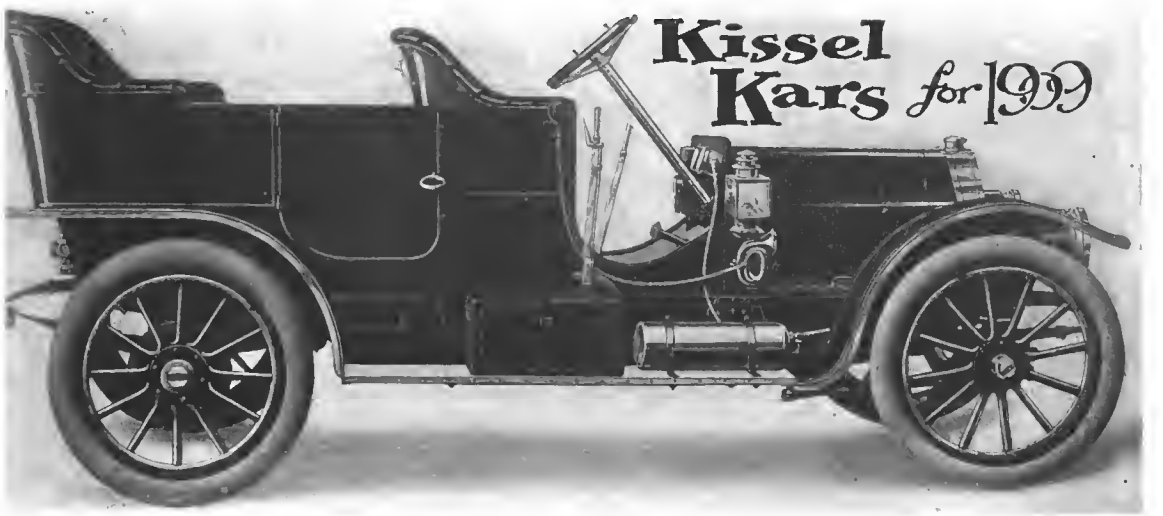
In the design of the transmission the Holsman Company has ollowed out its desire to make the whole machine as simple as possible, both the low and high speeds being direct from the motor shaft to the wheels, through the newly patented steel friction chain. One control lever of the rack and pinion type easily operates both forward speeds and reverse. There are no other change-gear parts or levers except the foot brake, and the vehicle starts and runs from zero to 25 or 30 miles an hour by friction of the steel chains operating on grooved sheaves on the ends of the motor shaft to the sheaves on both the rear wheels. In case of hills or mud, etc., sufficient to stall the motor on high speed, the low comes into action by engagement of sprockets on the motor shaft with the chain, and when the necessity for greater power has passed, the high gear automatically returns into operation by simply relieving the tension on the chains by the control lever. The reverse is accomplished by pushing the grooved pulleys on the ends of the shaft back into engagement with the channels or rims of the wheels, by the same control lever. The driving chains are wholly and automatically raised from engagement whenever the tension on them is relieved or the brake is set, or reverse is in action. Thus all operations of driving are accomplished with the power direct from the motor shaft to the wheels through the friction chain drive without the intervention

Crankshaft Blank and the Finished Piece.

of any countershaft or jackshaft, and the power is so sufficient that the company guarantees the motor to turn the wheels on any road surface whether the vehicle moves or not.

In the matter of conveniences, which go to make up a complete automobile, the manufacturers have provided some handy methods of operation. The motor shaft being across the car arrangement is made that the engine may be started from either side, and hand-in-hand with it goes the provision for steering from either seat, the steering lever being so designed that it can be turned either way, and operation is equally convenient from the right or left hand seat. The switch, ignition and carbureter adjustments are brought to the middle of the front seat so that the carbureter can be adjusted without stopping the vehicle. A weather-tight box is supplied in front and in the rear another compartment for carrying luggage, etc. Both the front fenders and the lamps turn with the wheels. In addition to this model there will be eight other Holsmans for the coming year.

A Pair of the Twin Pistons and the Shaft B



Forty Horsepower KisselKar Continued for 1909 in an Improved Form.

HREE chassis types of KisselKars are listed for 1909, one a carried-over type with improvements, the others new crea- . The carried-over style is a 36.1-horsepower, four-cylinder egularly rated at 40 horsepower. The new models are a 28.9- power, five-passenger car, also built in roadster and tour- t lines, and a six-cylinder 60-horsepower machine which, ac- ng to A.L.A.M., has a 54-horsepower rating. In all three the Kissel Motor Car Company, with its factory at Hart- Wis., follows the same design which can be summarized as cardinal constructions as cylinders in pairs with valves on eft side, cone clutch, selective gearset, shaftdrive, a general f Timken bearings, and double ignition.

e cars show many improvements over the constructions of resent year, many of which can be gleaned from the 36.1- power model, which is a continuation of this year's car. road wheels have been increased from 34 to 36 inches in ter; the wheelbase lengthened from 108 to 115; the I-beam lropped so that it affords a carriage 2 inches lower than this ; in the rear axle Timken roller bearings are used in front ear on the driving pinion; brakes have been increased from 14 inches in diameter with 3-inch width; the emergency is pulled instead of pushed in applying the brakes; instead making the tonneau 6 inches longer, gives room for additional seats. To these changes could be added a list of minor ones, all of which show the care with which the next year models have been worked out during the past year.

Of the two new models, the 28.9-horsepower one will doubtless be the popular branch of next year's output. It is made with a 4 1-4-inch square cylinder, conventionally designed with a two-part crankcase, three-bearing crankshaft, enclosed engine gears, and valves opened by direct lift from the camshaft, through lifter-rods with rollers on their lower ends; the crankshaft goes through the usual machining and grinding process and is carried on hand-scraped Babbitt bearings; the other motor parts, such as valves, camshaft, pistons and connecting rods are carefully manufactured. Lubrication is by mechanical force feed oiler, carried on the right rear motor arm; the Stromberg carbureter is fitted, and ignition is of the jump-spark type. In the ignition outfit is used an Atwater-Kent combination with dry cells, and Remy magneto with single unit non-vibrating coil, each operating with an independent set of spark plugs.

In the 40-horsepower four-cylinder, and the 60-horsepower six-cylinder, use is made of a 4 3-4-inch square cylinder, made in twin castings along the design identical with that of the little motor. In these the ignition is similar, except that in the six, when built for seven-passenger use, a Bosch high-tension magneto is fitted.

e four-unit coil
yed in the igni- system, use is
of an Atwater- t generator, or
magneto, and
the latter is
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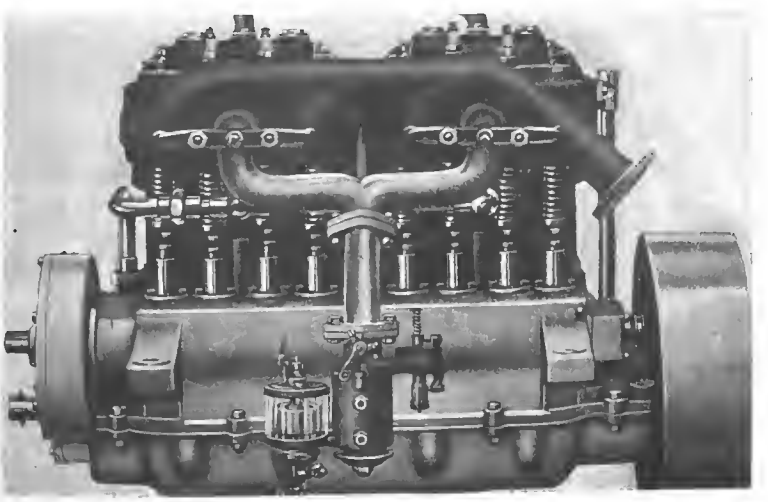
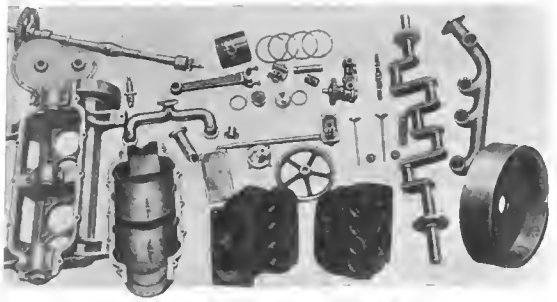


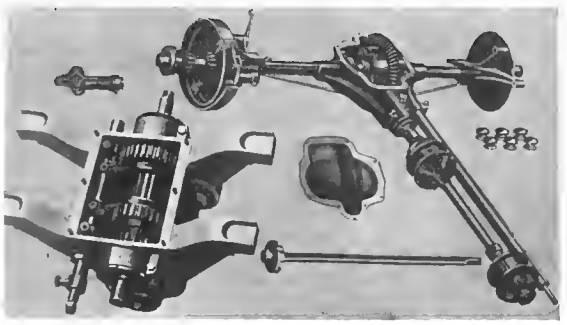
Motor of the KisselKar as Seen from Intake Side.

Conspicuous in the KisselKar transmission is the use of an inside change speed lever, which operates through a slot in the floor of the footboard, which location has been used to obviate the boring of the side member of the frame to accommodate the shifter sleeve attached to the bottom of the change speed lever. The transmission box finds support on the same



Chief Essentials of the KisselKar Motor.

bframe members which carry the motor, both of these import- it functionaries having a pair of integral side arms for support irposes. The Spicer universals, two of which are used in the opeller-shaft, are fitted with hardened and ground pins and ishings, and have metal covers for adjustment, giving proof gainst dust and the leakage of grease. The floating rear axle nstruction used in all models has the driveshafts supported on imken rollers, and the greatest improvement is the increased ze of the internal and external brakes. In connection with the loption of 3-4 elliptic springs in the rear, which is a change in irmony with several of the leading American makers this year, id which has been taken up by foreign makers during the last



Sliding Gearset and Rear Axle Driving Unit.

ouple of seasons, is the use of a conventional torsion bar be- veen the differential housing and the frame cross piece for osorbing the driving strain. Springs of this nature give a irticularly low body carriage at the rear, and afford good spring tion. The specifications of the different models are as follows:

-HORSEPOWER TYPE.

Motor, four cylinder, twin castings.
Bore, 4 3-4 inches.
Stroke, 4 3-4 inches.
A. L. A. M. horsepower rating, 36.1 horsepower.
Transmission, selective three speeds.
Rear axle, floating Timken bearings.
Front axle, dropped I-beam.

KisselKar Model LD 9, the New Car at $1,500.

Brakes, internal and external rear hubs 14 by 3-inch drums.
Wheelbase, 115 inches.
Wheels, 36 inches with Q. D. rim.
Rear springs, 3-4 elliptic.
Ignition, Atwater-Kent, or Remy magneto.

30-HORSEPOWER TYPE.

Motor, four cylinder, twin castings.
Bore 4 1-4 inches.
Stroke, 4 1-4 inches.
A. L. A. M. horsepower rating, 28.9 horsepower.
Transmission, selective three speeds.
Rear axle, floating, Timken bearings.
Front axle, dropped I-beam.
Brakes, internal and external rear hubs 14 by 3 inch drums.
Wheelbase, 107 inches.
Wheels, 32 inches with Q. D. rim.
Rear springs, 3-4 elliptic.
Ignition, Remy magneto with coil and dry cells.

60-HORSEPOWER TYPE.

Motor, four cylinder, twin castings.
Bore, 4 3-4 inches.
Stroke, 4 3-4 inches.
A. L. A. M. horsepower rating, 54.1 horsepower.
Transmission, selective.
Rear axle, floating, Timken bearings, re-enforced.
Front axle, dropped I-beam.
Brakes, internal and external rear hubs 14 by 3-inch drums.
Wheelbase, 130 inches.
Wheels, 36 inches.
Rear springs, 3-4 elliptic.
Ignition, Atwater-Kent system and Bosch magneto.

THE AUTOMOBILE CALENDAR

AMERICAN.

Shows and Meetings.

Dec. 31-Jan. 7..—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reevee, General Manager, 29 West 42d St.

Jan. 16-23.....—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. M. L. Downs, Secretary, 7 West 42d St., New York City.

Jan.....—Fourth Annual Meeting, Society of Automobile Engineers. Dates to be announced definitely later. Charles B. Hayward, Secretary, 231 West 39th St., New York.

Feb. 6-13.....—Chicago Colleeum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. S. A. Miles, Manager, 7 East 42d St., New York.

Mar. 7-13.....—Buffalo, Second Annual Power Boat and Sportsman's Show, Convention Hall, Dal H. Lewis, manager, 760 Main Street, Buffalo, N. Y.

Races, Hill-Climbs, Etc.

Oct. 24.....—Vanderbilt Cup Race, Long Island Course, auspices of Vanderbilt Cup Commission.

Oct. 31.....—Philadelphia, Sixth Annual Run of Automobile Club of Philadelphia for the Brazier Cup.

Nov. 5-7.....—Detroit, Three-Day Endurance Run, Detroit Automobile Dealers' Association.

Nov. 26.....—Savannah, Ga., Grand Prize Race, Savannah Automobile Club.

FOREIGN.

Shows.

Nov. 13-21.....—London, Olympia, Seventh International Motor Exhibition.

Nov. 28-Dec. 13.—Paris, Eleventh Annual Salon de l'Automobile, Grand Palais, Automobile Club of France (Pleasure Vehicles, etc.)

Dec. 20-28.....—London, Stanley Show, Agricultural Hall.

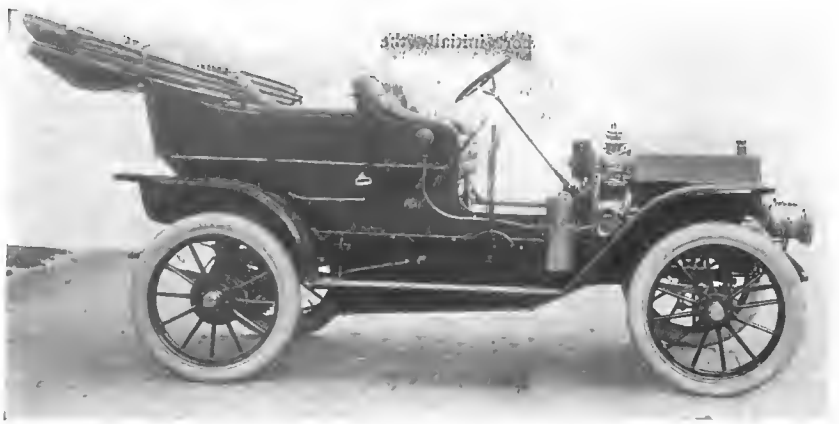
Dec. 22-29.....—Paris, Eleventh Annual Salon de l'Automobile. (Commercial Vehicles, etc.)

Jan. 16-25.....—Brussels, Show Organized by Belgian Chamber Syndicate, Palais du Cinquantenaire.

TWO NEW MODELS OF THE REO FOR 1909

MANY American automobile manufacturers have been striving for some time to produce a machine at a price which would be within the reach of the largest number, but were unable to do this for some years, largely because of the expense of production due to the newness of the industry. For 1909 the Reo Motor Car Company, of Lansing, Mich., is producing two new models similar to the 1908 design but at a lower cost, which it thinks will meet the requirements for this class of car.

Although the specifications for the 1909 models are the same as the 1908 cars with the exception that the wheelbase of the two-cylinder touring car and roadster is increased from 94 inches to 96 inches for the purpose of providing more leg room, some few changes have been made, all tending to add to the general improvement of the Reo product. The hood, which is similar to the 1908 type, has been reinforced at the corners with filler tubes extending through the top in place of the old style loose cover. The body is of aluminum coated metal with detachable rear seat. To insure proper lubrication grease cups are provided on all outside oil holes, spring shackles, steering spindles, and reach rods. The brake lever has been lengthened, giving a greater leverage and insuring better and easier control of the car. The front axle has been changed to the I-beam drop-forged type, with ball-bearing front spindles and 5/8-inch balls. The steering post has been given more rake to facilitate handling the car, and the steering gear has also been materially strengthened. The transmission brake drum is of a new design, in order that improvements tending to make the chain noiseless could be incorporated in the new models.



Five-passenger, 20-Horsepower Reo Touring Car for the Coming Season.

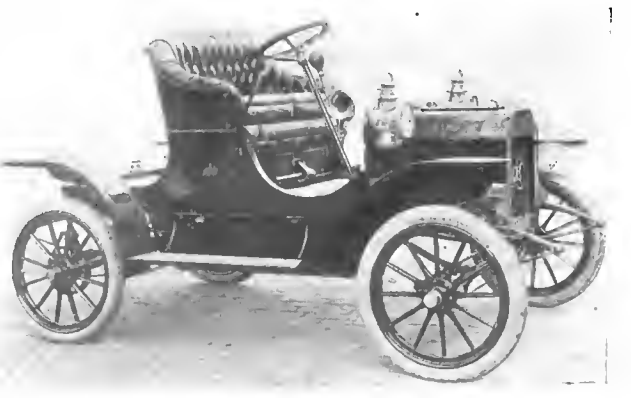
Model H 20 horsepower roadster, listing at $1,000, is built on the same chassis as the touring model except that in place of the tonneau a trunk box is fitted to the back and an extra seat, with a rail around the floor boards; in addition this model is furnished with a top as the regular equipment. Should the owner ever desire to convert this model into a touring car he can readily do so as the design is so arranged as to provide for this.

In the two passenger 10-horsepower runabout the Reo people are furnishing the same car for 1909 as the 1908 model for $500, with some changes for the better. The chassis is the same except that now they have made use of similar cam-shaft bearings and valve mechanism as is employed in the two cylinder machines. The front axles are also of the same type as the larger car, being I-beam sections from drop forgings; 5/8 inch ball bearings are provided on the front spindles the same as for the larger model and grease cups on all outside bearings. In general design the body has not been changed although the seat is similar to the one on the two-cylinder car, undivided, straight back, of aluminum metal material. The fenders on this model are all skirted the same as on the higher priced machine, which protects the body and lessens vibration.

In the matter of finish and general workmanship the Reo Motor Car Company has seen to it that when these new models are sent out from the factory they will make a showing both in appearance and performance on the road that will be in itself a tribute to the moderate and low-priced cars. The power plants of the Reo cars are so well known that comment seems rather unnecessary here; the same two and single cylinder engines with 4 3-4 inches bore and 6 inches stroke being used for 1909. The spring equipment—another vital part of a machine—has also proven itself efficient for the service required and no change has been deemed advisable.

The manufacturing of these two models realizes an old ambition of R. E. Olds and R. M. Owen, that is, to put on the market a touring car and a runabout at a popular price and of material which they felt would bring credit to the makers.

20-Horsepower Reo Roadster with Extra Seat.



Reo 10-Horsepower Runabout Listing at $500.

WILBUR WRIGHT TAKES PASSENGERS ALOFT

By W. F. BRADLEY.

LE MANS, Oct. 10.—Any man, even in France, who would maintain that Wilbur Wright is not at the head of all aeronautical experts would now be looked upon as a fool. Even the weak criticisms against the starting rail and the home-made motor are becoming less and less, experts and the public recognizing that if the workmanship is rough the machine is none the less the only one that can fly whenever its owner wishes to go aloft.

After showing that he could make time and distance records in order, Wilbur Wright began a series of demonstrations with two persons on board. First place was offered to a couple of journalists, the one American the other French. The representative of the New York *Herald* preferred the short initial flight to the second record-breaking soar.

"Sit well back in your seat, push that lever down when I nudge you elbow, then look pleasant; that is all you've got to do." Such were the brief instructions that Wilbur Wright gave to his passenger as he mounted into the roughly made seat stuffed with straw and covered with sacking. A minute later the two mechanics had started the engine by swinging round the propellers, Wright had buttoned his coat, pulled down his cap, then released the pin and shot off into the air.

Wilbur Wright Regulating Aeroplane; Henry Farman Thinking Hard.

Immediately it was evident that with two persons the aeroplane acted better than with only one. During the morning, when flying alone, the aeroplane had advanced with a gentle wave-like motion. With a passenger on board the line of march was so straight, the machine remained so accurately at the same elevation that it appeared to be guided through the atmosphere by invisible cords. As it neared the end of the field it descended a little, for all curves are taken with a considerable inclination, much in the same way as a cyclist would take a banked curve, but immediately after the original height was again attained and maintained. The curves are necessarily sharp, for the field, though about three miles in length, is not more than 400 yards in width, and Wright never uses more than 300 yards. Two complete rounds were made, lasting a fraction over three minutes.

Frantz Reichel, a Parisian journalist, was next invited to get into the machine, and another start was made with just the same ease as before. Instead of a couple of rounds of the field, however, the artificial bird soared around and around for almost one hour, the time, according to the official figures, being 55 minutes 23 4-5 seconds. As it was 5.20 P. M. when the flight was commenced, daylight had given way to dusk before the white flyer settled down again with its calm, collected Yankee pilot and its excited, vivacious French passenger.

Not a word had been spoken up aloft, for the simple reason that Wright ignores French and Reichel's English vocabulary is limited to "all right." But he made up for it on reaching ground, and the story of the tremendous rush at the starting line, the calm, majestic flight, broken only by the monotonous rattle of the open exhaust, the approaching darkness, the wonderful control, and finally the apparently tremendous rush toward earth, followed by a stoppage so gentle that not a tremor was felt—all this was told a score of times in that picturesque manner that only French can command, repeated to all on the journey to Paris and again related on the following day.

After a Sunday spent behind closed doors, the aeroplane was brought out early on Monday morning and an invitation sent to Léon Bollée to come for a flight. Though he needed no pressing, the pioneer automobile constructor was certainly surprised, for he scales 238 pounds, and such weights have not generally been associated with aeroplanes. But the "cent kilos" of the motor manufacturer were taken aloft as easily as the feather-weight journalists, and when Léon Bollée came to earth after 4 minutes 9 seconds in the air he was so delighted with the simplicity of operation that he wanted to make a flight alone. After the president of the Sarthe Aero Club, the vice-president, René Pellier, was also invited to take a ride. Again it was a heavy weight, for though M. Pellier has not the same corpulence as Léon Bollée, he can lay claim to close on 200 pounds weight.

The second flight lasted 3 minutes 54 seconds, but was immediately followed by two others, still with the same passenger, one being for 7 minutes 30 seconds and the other of 30 seconds only. A slight incident marked the last flight which, though not of great importance in itself, was sufficient to show the wonderful control that Wright has over his apparatus. His cloth cap being in danger of being carried away by the wind, Wilbur Wright put up his hand to save it, at the same time releasing his hold of the elevation rudder. The action caused him to touch the string by which the ignition cut-out is operated, and immediately the motor stopped. Seizing the lever again, Wright brought his machine back to earth a little more brusquely than usual, but without any serious shock.

Long and careful preparations were made before any of the two-men flights were attempted. The engine was dismounted, carried to the Léon Bollée factory at Le Mans, and thoroughly overhauled, the lubrication especially needing attention. While it was under repair the two propellers were changed for a pair of larger diameter and much broader face, the pinions also being changed to give a slightly higher speed, the ratio now being 33 to 10. The test on the block was not considered sufficient, however, and for one hour the motor was run in the open air while several thousand people stood round and fumed with impatience. Darkness came down while the motor was running, the crowds reluctantly melted away, and the aeroplane was wheeled back to its shed. Even next morning a flight with a passenger was not attempted immediately, but several rounds of the field made alone at a height of not more than one foot from the ground. It was doubtless done as a precaution after the accident in America, but was nevertheless one of the most remarkable demonstrations ever made, the areoplane just skimming over the ground, yet never striking any of the obstacles. Wright laughingly declared that he was practicing for an automatic shaving apparatus; he would attach the razor to the bottom of his machine and the customer would lie face upwards on the ground. It was only after five or six flights alone, each time at an increased height, that Wilbur Wright appeared to be satisfied and offered to take the first passenger with him.

One of the reasons for the special precautions is that the larger propellers come very close to the wire cables operating the rear propeller, and it was owing to this cable being struck by one of the propellers that Orville Wright's accident occurred. This, at any rate, is the explanation given by the brother in France, and in confirmation of the theory it was noticed that a special stay had been fitted to prevent any of the cables fouling the propeller, even, if for any reason or other, they were slackened off during a flight.

Wilbur Wright's method of control is simplicity itself. On the machine being placed on the starting rail and the 1,700-pound weights being drawn to the top of the pylone, the end of the rope is attached to the wooden carriage on which the aeroplane rests. This task is invariably attended to by Wright himself. Standing in front of bis machine, Wilbur Wright relieves the compression, orders his mechanics to give two or three turns of the propellers, injects a little gasoline through the two air inlets, then gives the order for a sharp pull on each of the propellers. Generally the motor goes off at the first pull, and immediately runs at its maximum, for there is neither spark lever nor throttle control, the pilot thus being under no necessity to occupy himself with the engine while in the air. If it is desired to stop, the pilot puts up his hand and strikes a piece of string attached to one of the wire stays. This short circuits the electric current, and, of course, causes an instant stoppage of the motor. The engine, which bas four separate water-cooled cylinders of 4 by 4 3-4 inches bore and stroke runs normally at 1,100 revolutions a minute. The gasoline supply is carried in a cylindrical tank suspended to the uprights, and sufficiently high to assure a flow by gravity. There is no carbureter, the engine being fed by direct injection, the pump being within the crankchamber and worked by worm gear off the camshaft. Inlet valves are automatic and exhaust valves mechanically operated, but sets in tbe cylinder head. Ignition is by Eisemann high-tension magneto, bolted to the engine base, and having separate coil immediately under the wooden frame on which the motor rests.

Wright and Zens Ready for Flight.

When flying, the pilot has to operate two levers only, the one in his left hand having a fore and aft movement only, and controlling the front elevation plains, and the one in his right hand having a combined fore and aft and left and right movement. If pushed to right or left, it operates the rear rudder in just the same way as the tiller of a boat, and gives a right or left turning movement to the aeroplane. If pushed forward at the same time, it elevates one wing tip and lowers the other; if pulled rearward, the wing tips are pulled in the opposite direction.

Léon Bollés, who during his flight closely watched the operations of Wright, declares that the apparatus is heeled over, by means of the curving of the wings immediatcly before the turn is taken and brought back to a horizontal position a few seconds before the turning movement is completed. As soon as thc aeroplane is brought back to a horizontal position, the wing, which was describing the shorter curve, regains its speed until it is traveling as fast as the other, and there is a very energetic leveling movement for a slight bending of the wings.

To tbe spectators, the turn takes place much earlier than is really the case. Wright first inclines his apparatus to a sufficient degree, and it is only when it is sufficiently inclined that he operatcs his rear vertical rudder and makes the actual turn. This phase of the operation of an aeroplane presents a very interesting study, and its scientific side has phases that never fail to interest.

Wright Captures Official Two-Passenger Record.

LE MANS, Oct. 12.—Still another record for Wilbur Wright. With Arnold Fordyce, a French journalist, on board, the white bird from Dayton has remained above the heather-covered military ground in the neighborhood of Le Mans for 1 hour 4 minutes 26 1-5 seconds, beating all two-man aeroplane records and fulfilling the conditions imposed by the Lazare Weiller committee.

It was not intended to make a flight on Tuesday, October 6, for the magneto had gone out of business and Wright had no desire to venture aloft until the motor was in perfect condition. Contrary to his usual custom, Wilbur Wright allowed an outsider to examine his carefully guarded machine, with the result that M. Girardot and Hart O. Berg's mechanic quickly diagnosed and remedied the defect of the magneto.

A little before six a start was made, the machine at once rising to a height of about 75 feet and remaining there despite the gusty weather for half an hour. At times a guest of wind would catch the aeroplane, causing it to make a dive that looked dangerous to the public. But Wilbur Wright was never caught napping. To each sudden change of the wind he replied by a manipulation of the rudder and a working of tbe wings that brought the artificial bird to an even keel and kept it on its right course to the finish. Later, in view of the approaching darkness, a descent was made to about 30 feet from the ground, and it was while at this height that the signal was given, by means of two white lights from the observation tower, tbat the previous record had been broken. When it was certain that he had been aloft more than an hour Wilbur Wright descended between the starting rail and the wooden shed which serves as home for himself and his artificial bird, when both machine and operator are at rest and hidden from the world at large.

Since making his record flight Wilbur Wright has been allowing aeronauts, journalists and othcrs to taste the joys of mechanical flight. Hart O. Berg, as a reward for his active organization of the Wright demonstrations in France, was given a sail in the air for 3 minutes 24 seconds. Mrs. Berg then took her husband's place, and for 2 minutes 3 seconds evolved over the heads of the spectators. Later in the day four other privileged individuals were takcn aloft with the American aeronaut for flights that lasted on an average 4 1-2 minutes.

The following day a group of Englishmen were initiated into the mysterics of aerial flight, Griffith Brewer, Hon. C. S. Rolls, Frank Butler, and Major Baden Powell being successively flown twice around the field. Madame Léon Bolée, following the example of her husband, asked for a ride and was rewarded by a flight of three minutes. Finally Commandant Bottiaux, chief of the Chalais army balloon station, was given a special demonstration, Wright starting low, then rising suddenly to a height of 80 feet, then again descending until he was so low that his skates almost touched the top of the heather, and his propellers disturbed the loose sand on the open spots.

THE AUTOMOBILE

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FOUR-CYCLE FINALITY OF DESIGN.

It is with considerable reason that the present day our-cycle motor has been regarded as a close approach finality of design where its type is concerned, and that total departure rather than a modification of existing ethods has been looked forward to as the trend of the ature. In other words, the development of the two-cle motor to a point where it was considerably the su-erior of the present four-cycle type has been considered s the logical outcome of the persistent efforts of in-entors to improve the internal combustion motor. lence, the report that one of the foremost Continental otor builders has definitely decided to adopt a sliding alve type of four-cycle motor of American origin from ow on, comes as no little surprise.

The poppet valve has its drawbacks, but its advantages ver any other method of admitting and exhausting the harge hitherto developed have been so numerous and ractical that its abandonment has not been considered robable without a change of cycle. The handling f the fuel through ports of large area, opened and closed y the piston itself has always appealed to the designer f internal combustion motors as one of the chief prom-ses of the two-cycle type, in that it makes for a degree f simplicity to which the four-cycle motor, with its multiplicity of small parts, does not lend itself. But if this end can only be achieved by the employment of an equivalent amount of gearing to open and close the ports, wherein lies the advantage?

Simplicity, coupled with a high degree of efficiency, must ever be the chief aim of the inventor whose object is the advancement of the present day motor, and this is not to be attained by the abandonment of a form of mechanism that years of practice on a great number of motors has shown to be practical, in favor of a device, the chief merit of which is that it accomplishes the object in a different manner, but with no reduction in complication, relatively speaking. The mere fact that the result in view may be brought about by the new method is not sufficient to recommend it as being superior to the device it is intended to supplant, which appears to have been the basis upon which many so-called improvements in automobile construction that have since been relegated to the limbo of oblivion, were accepted. But in the present instance the reputation for conservative and consistent adherence to sound and well-tried principles of design on the part of the European house lends added weight to the report of the adoption of this new type, though further developments in this direction will be looked forward to with a great deal of interest.

* * *

A DEPARTURE IN BRAKE PRACTICE.

One of the last things that the average driver is anxious to have come in contact with the brakes of his car is oil, so that at first sight the proposal to employ brakes running in oil appears somewhat far-fetched, in view of the fact that even a small amount of lubricant is destructive of the frictional properties of two rubbing surfaces. This is true of metal, wood, or fiber surfaces, regardless of their character, but it is one of the peculiar properties of cork that its coefficient of friction with a metal surface is but very slightly influenced by the presence of oil in any quantity, and it is this that has made possible what may best be termed an oil-cooled brake.

The metals employed are bronze against steel, the former constituting the shoe or moving member, being shod with corks embedded in its face. This member is immersed in a bath of lubricating oil and is constricted against a steel drum, or expanded to contact with it, according to the requirements of the design. In one instance, a brake of this type has been employed on a car that saw 12,000 miles continued service of the most strenuous kind, but an examination revealed no perceptible wear in the braking surfaces.

This was naturally to be anticipated in view of the protecting influence of the oil, and the possibilities that it throws open in the way of improved brake service, as compared with the present day practice of employing frictional materials that must, of necessity, be renewed periodically, are limitless. It would be futile to attempt to pit either the water or the air-cooled brake against one constantly immersed in oil, as in view of the peculiar property of cork in not losing its frictional properties under the influence of a lubricant, the advantages of a generous supply of oil for cooling are obtained, without the attendant disadvantages of lubrication, which are naturally not to be desired where the object in view is the maximum friction.

FROM BOSTON TO NEW YORK BY MOTOR AIR LINE

BOSTON, Oct. 20.—When the Glidden tour paused in Boston, last July, Charles J. Glidden, the donor of the trophy, caused a brief commotion by letting out the fact that he was organizing a company with the object of establishing a passenger and freight service by balloons or other means of aerial transportation between this city and New York. The scheme was looked upon with considerable scepticism by the general public, but those whose memory carried them back a few years to Mr. Glidden's prophesies of the development of the motor vehicle, did not scoff. To-day it looks as if commercial aerial navigation may not be so very far distant.

Captain Thomas S. Baldwin, the aviator, who recently sold an air-ship to the United States government, was in this city yesterday and to-day and held a conference with Mr. Glidden concerning a contract for a dirigible balloon to be used by the Aerial Navigation Company in establishing the beginning of its New York service. The air-ship will be of large proportions, capable of carrying two passengers in addition to the operator, and it will cost about $25,000 to start the service. The money is available, so that there will be no bonds or stock to be floated as an additional burden on the air line. It is not proposed at once to undertake a direct New York service. In fact, the plans so far arranged are very conservative. They contemplate an air-ship service two or three times a week between a station to be established on the outskirts of this city and South Framingham, about twenty-five miles away.

The Boston station will be established at a point easily accessible for some of the lines of older transportation companies and the hydrogen gas for the air-ship will be manufactured at this station. Captain Baldwin has discovered a fabric for air-ship or balloon envelopes which he believes will help materially in solving the problem of preventing the waste of gas and he will use this material if he is given the contract for the balloon. If the Boston-South Framingham service develops as well as is expected other stations will be added and eventually there will be a through line to New York. The company has not yet progressed far enough to establish a freight and passenger tariff and is more interested in starting the line than in the profits.

AN INTERNATIONAL SPORTING TRUST?

The International Association of Recognized Automobile Clubs of the World has some grand plans in view for the future, and the story heard at Dieppe, to the effect that the scope of its operations would be extended to include motor boating and aeronautics, is now verified by an announcement from Secretary S. M. Butler, of the Automobile Club of America. This is to the effect that this club has been selected as "sole representative in America, which selection carries with it the sole governing authority in all international motor boat races or competitions held in the United States." The exact name of this new motor boating body is "The International Association of Yachting-Automobile." It is known that recently, under the direction of Dave Hennen Morris, the A. C. A. has been organizing a motor boat section, "and this division will be strictly a yachting adjunct to the club."

The principal objection of American automobile clubs against the present international organization is that it permits only one club to represent a country, and compels all other clubs to deal through the club possessing membership, even if that club is not selected by the entire association of clubs. A similar objection will undoubtedly be encountered in motor boating and also in aeronautics.

It is now generally known that an unusual combination of circumstances brought about the continuance of the A. C. A. as the international automobile voice from this country, and there are American clubs which are finding considerable fault with the arrangement consummated. What the future may develop seems to be a matter of varied opinion.

QUAYLE VICTOR IN SPEED TRAP FIGHT.

ALBANY, N Y. Oct. 20.—Oliver A. Quayle, a victim of the notorious Glens Falls speed trap, has won out in his stubborn legal fight to have his conviction set aside. Quite a howdydo followed Mr. Quayle's conviction, for the reason that he is president of the New York State Automobile Association, whose policy is to uphold the speed laws of the State. Mr. Quayle appealed his case, and the county judge of Warren County has just reversed the judgment of conviction.

This Glens Falls speed trap has been operated for the past two years and many a tourist has fallen into its clutches.

Mr. Quayle was arrested last June while touring with his wife. His contention was that the trap was improperly operated, to the end that injustice was done, not only in his case, but in that of many others. The result of his appeal confirmed his contention. It will probably encourage other automobilists to take appeals in cases of flagrant injustice and may possibly enlist the more active and general co-operation of local clubs in their efforts to have the evidences of speed law violations collected in a way that gives no opportunity for injustice.

A Y. M. C. A. SCHOOL FOR PHILADELPHIA.

PHILADELPHIA, Oct. 19.—Following the example of New York, Chicago, and other large cities, Philadelphia will have a Y. M. C. A. automobile school. On the 21st of this month the scheme will be inaugurated at the Kensington Y. M. C. A., at 1854 Frankford avenue, under the chief instructorship of William Vees, a well-known owner and operator of automobiles.

MASSACHUSETTS COURT RULES FOR LOCAL REGULATIONS

BOSTON, Oct. 20.—The full bench of the Massachusetts Supreme Court to-day handed down a decision in the case of the Commonwealth against Arthur Kingsbury, for which automobilists have been looking forward for several weeks, or since the case was heard at the Franklin county session. The court decides adversely upon Mr. Kingsbury's contention that the law permitting local boards of aldermen and selectmen to exclude automobiles from certain highways, is unconstitutional.

Mr. Kingsbury was arrested for driving his automobile on a highway in the town of Ashfield, from which the selectmen had voted to exclude motor vehicles and which was posted to that effect. He was convicted and upon appealing to the superior court lost his case in a jury trial. He then carried it up to the supreme court, which holds that statutory regulations of the speed of automobiles running on highways are reasonable and proper.

The court decides that the right of the Legislature, acting under the police power, to prescribe that automobiles shall not pass over certain streets or public ways in a city or town, seems to be well established upon principle and authority; and that the Legislature has the right to delegate police powers to aldermen of cities and selectmen of towns.

KNOX WINS FREE-FOR-ALL AT LENOX.

LENOX, MASS., Oct. 14.—Under the auspices of the Lenox Automobile Protective Association a hill climb was run here to-day. The course was up Church Hill and Aspinwall Park and finished at the Aspinwall Hotel.

A tangle has arisen over the sanction that has some elements of the humorous to it. It happens that a high priest of the metropolitan club with national aspirations is a patron of the hotel at the finish line and that mine host had much to do with the promotion of the meet. Little wonder was it that the landlord in question knew of no other organization that could possibly rule automobiledom than the club, over which once reigned his distinguished guest, and so wrote the manager of its touring bureau for information as regards a sanction. The touring official promptly replied that no sanction was needed, and mine host proceeded with his meet accordingly. M. L. Downs, of the A. L. A. M., a wise and prudent-going man, who went up to Lenox to officiate as judge, bethought himself before the climb had reached a conclusion to ask the promotor for his sanction and received the rather startling information herein above set forth.

The course was nine-tenths of a mile in length, with three sharp turns and grades varying from 9.15 to 12.5 per cent. There were a couple of accidents in the course of the contests. William Bourque, of Springfield, in a Knox collided with an iron post in Aspinwall and was thrown out. Floyd Knight, of Pittsfield, in seeking to avoid a collision with another machine, ran into a tree and put his car out of the climbing for the rest of the day. The Knox and William Bourque, however, were not injured enough to prevent their being gotten into shape for the subsequent climbs, or to prevent them winning the free-for-all and the event for cars from 24 to 40 horsepower as well. The summary follows:

FREE-FOR-ALL.

1.	Knox	38	William Bourque	1:19
2.	Stearns	30-60	William Swan	1:34
3.	Berkshire	30-35	S. H. Clapp	1:43 1-5

FOR CARS FORM 40 TO 60 HORSEPOWER.

1.	Stearns	30-60	William Swan	1:38 1-5
2.	Stilson	55	F. A. Knight	1:47 1-5

FOR CARS FORM 24 TO 40 HORSEPOWER.

1.	Knox	38	William Bourque	1:34
2.	Pope-Hartford	28	O. R. Hutchinson	1:47 1-2
3.	Pope-Hartford	30-35	Lester Phillips	1:57
4.	Buick	35-40	F. A. Knight	1:55 1-2
5.	Berkshire	30-35	J. E. Crabe	2:25 3-4

A HOTEL TRAIN TO SAVANNAH GRAND PRIZE.

That New Yorkers contemplating witnessing the Grand Prize race at Savannah may be assured of all the comforts of a well-appointed hotel and the finest cuisine, W. E. Conklyn, the general eastern passenger agent of the Seaboard Air Line, has arranged for a special train to leave New York at midnight on Monday, November 23. It will be made up of Pullman compartment sleepers, a dining car, and a buffet smoker. It will leave Savannah so as to reach New York at five o'clock in the afternoon on Friday. During the sojourn in Savannah the train will be side tracked and used practically as a hotel. A reasonable rate has been estahlished for the trip.

THESE MUNCIE HOOSIERS ARE HUSTLERS.

MUNCIE, IND., Oct. 19.—The Inter-State Automobile Company of Muncie, Ind., is setting a record pace in progress. It was only a couple of months ago that Thomas Hart, George Ball, William Ball, T. F. Rose, J. M. Waring and other Muncie capitalists formed the company and employed Claude Cox to design a car. On September 14 they got the deeds to some 40 acres of well-located land and by October 14 were putting under roof their first building, a fine structure of brick, steel and glass, 140x440 feet. They expect to begin turning out cars January 1, and have arranged for an output of 1,000 the first year. They will continue the erection of new buildings.

A NIGHT IN TRENTON WITH AUTO PATROL.

TRENTON, N. J., Oct. 12.—"Seems to me I've seen you before," remarked Captain Cleary, as he chewed his mustache reflectively and looked us over, when we arrived at Police Headquarters.

"Oh, yes; now I remember; violating Section 146 of the motor vehicle law, wasn't it?

"You don't care to stay this time, I suppose?" he smiled.

"Well, no; not exactly. You see, we came over to see the new White patrol and ambulance in its natural environment."

"Say, that car's all right. Haven't had time to make its acquaintance personally yet, but do you know, since we retired that old horse ambulance and the 'hurry up wagon,' your car has done the work of the two of them in one-third the time. The only trouble with it is that it's too popular. Guess we'll have to put a row of tacks in the seat. But there goes the bell."

It took us just four minutes to cover the mile and a quarter of busy street, dodging this way and that.

At a glance we realized what had happened. The horizontal ladder had given way at one end and the two painters at work upon it had fallen three stories to the sidewalk. One was unconscious, the other was suffering intensely from a compound fracture of the leg. The stretcher was produced from its compartment beneath the car, and in another minute we had our two patients on board and were off for St. Francis Hospital.

Trenton, N. J., Now Employs a White Steamer as a Patrol.

We were back at "Headquarters" in twenty minutes from the time we left, but were soon off again on another run. The car was wanted at the Court House to transfer a load of prisoners to the County Jail. This trip was a longer one, and by the time we got back there were two calls waiting. There was no time for dinner, for it was Saturday night and people were beginning to get drunk. The one at Box 23 was of the ordinary uninteresting variety; the other was a regular patron, and treated the occurrence with the indifference gained from many similar visits. Another call soon followed, and again we started. There had been a fight, it seemed, which fact we could well believe when we got there—either *that* or an earthquake—for there wasn't a whole window light left in the place. But the participants had fled, nobody knew where. We looked high and low, but evidently they had made good their escape. Returning to the "wagon" we noticed that the driver, who is never permitted to leave his seat, was missing. Fearing that he had met with foul play, we started round the building, prepared for the worst, when we came upon him. He was down on his knees, the tail lamp in one hand and his pliers in the other, pointing them down a cellar-way. At a glance we took in the whole situation. The driver had spotted one of the malefactors and, lacking a better persuasive, was brandishing the shiny tool in the face of the man in the hole, from which came in agonized tones the repeated assurance that he would give up.

"Well, I'll be hanged," said one of the officers, "if that kid driver ain't put it all over

WHAT IS DOING AMONG THE CLUBS

AGO CLUBS HAVE REAL AMATEUR CONTEST.

:AGO, Oct. 16.—Chicago's record for originality in the tion of motoring events was fully sustained yesterday the Chicago Athletic Association and the Chicago Auto- Club took part in the first amateur inter-club reliability match ever promoted, it is claimed. True, the present n is somewhat on this order, and while the clubs sup- y battle for the big trophy, yet in reality it is a struggle desmen. Not so was this affair of yesterday, for only ; drove, by which term is meant that no one at all affiliated he trade was permitted to drive. This brought about a ide contest which has done much to make motoring com- ns popular among the owners of Chicago.

inter-club team match stirred the town from the ground he leading dealers gladly turned out to act as observers, e whole affair went off with a snap and bang that aroused l enthusiasm. It had been planned to have ten cars eam, but this match being a new thing with the Chicago ic Association, the cherry circles found it hard to get that cars. Six only came to the tape, and as the Chicago obile Club had ten members eager for the fray, the n rule was adopted and the automobile club penalized ths of a point as against a full point for the C. A. A. lts gave the victory to the Athletic association, its team incurring only 4 points penalization as against 732 for the obile club. The latter lost out through accidents early in ht. The match was over the Elgin-Aurora circuit, but the two teams got out of town W. A. Egermann in a er was put out by a broken axle, and, a little later, T. P. rson in a Studebaker, skidded on Milwaukee avenue and a wheel. Egermann telephoned for another car and the circuit, while Henderson secured a new wheel and aught up with the procession. The others went along nly minor mishaps, the most serious of which were a r adjustment, taking on water and motor stops. The of the judges was as follows:

Chicago Athletic Club.

Entrant and Car.	Score.
W. Ham, Locomobile	Perfect.
P. Knisely, Premier	Perfect.
J. Ireland, Stevens-Duryea	Perfect.
K. Cochrane, Stoddard-Dayton	Perfect.
W. Wentworth, Rambler	1 point.
K. Young, Thomas	3 points.
Total	4 points.

Chicago Automobile Club.

E. Nash, White	Perfect.
V. Gethre, Stevens-Duryea	Perfect.
Tarrant, Jr., Stoddard-Dayton	Perfect
L. Van Sickien, Apperson	Perfect.
Joll Shaffer, Stevens-Duryea	Perfect.
I. Purdy, White	Perfect.
. O'Hare, Thomas	1.8 points.
. Gregory, Thomas Forty	15 points.
. Henderson, Studebaker	115.2 points.
A. Egermann, Rambler	600 points.
Total	732 points.

ules were easy, calling for the contestants to make a or stop run, with penalties for taking on fuel or water repairs or adjustments. Owners had to drive them- The running time averaged up about 15 miles an hour me was late at controls.

I CAROLINANS ORGANIZE CLUB AT RALEIGH.

B. N. C., Oct. 19.—The automobile enthusiasts of Ra- C., have decided that it would be to their benefit as he city's if they had some good permanent organization, well attended meeting the Raleigh Automobile Club ially launched with everything pointing toward success. iota of officers were elected and a suitable constitution aws adopted.

MARYLANDERS ELECT DR. ROWE AS PRESIDENT.

BALTIMORE, MD., Oct. 17.—In addition to electing officers for the ensuing year, the Automobile Club of Maryland, at its annual meeting, transacted other important business and determined upon what the members call a rejuvenation with the result that many suggestions for a busy winter were made. The officers elected were as follows:

President, Dr. H. M. Rowe; vice-president, D. C. Walker; treasurer, Ernest J. Knabe, Jr.; secretary, Frank W. Darling.

Board of Governors—James S. Reese, M. S. Hess, C. H. Millikin, A. A. Piper, B. B. Friedenwald, R. M. Norris, Dr. H. M. Rowe, D. C. Walker, Ernest J. Knabe, Jr., and Frank W. Darling. Osbourne I. Yellott was reelected counsel.

An important feature of the meeting was the report of the committee on good roads to the effect that the Baltimore County Commissioners had offered to give the club 800 sign-boards, 2 feet long by 8 inches wide, and furnish posts for the same, provided the club would paint them and place them in position at points along roads to guide autoists on touring trips. The offer of the commissioners was unanimously accepted. The committee announced that it had already decided upon the locations of 250 of these signs, which will be placed at crossroads and dangerous curves. Later on the club will make efforts to have the commissioners of other counties in the State co-operate with them for the purpose of having similar signs placed in the different counties.

One of the suggestions at the meeting was for a club publication. This paper will be issued for the first time next month and will be known as the *Maryland Motorist*. Most of the reading will be of matter in which Maryland motorists are interested. Frank W. Darling, secretary of the club, is chairman of the committee in charge of the publication.

It was also decided to hold a hill-climbing or a non-stop, sealed-bonnet contest in the near future, while it was also proposed to hold an annual endurance contest.

A. C. OF PHILADELPHIA ANNUAL FOR BRAZIER.

PHILADELPHIA, Oct. 19.—The seventh annual Brazier Cup contest of the Automobile Club of Philadelphia will be held Saturday, October 31, over a roundabout course of about 65 miles—via Lonsdowne, Alden and Swarthmore to Media; via Newton Square and Devon to Valley Forge; thence through Bridgeport, Norristown, Centre Square, Antler, and Chestnut Hill to the Racquet Club in this city. The object of the run will be to keep as closely as possible to the legal speed limit, and the committee in charge has already gone over the ground and decided on a secret minimum, the car coming closest thereto being awarded the cup. The number and variations in the speed limits of townships, villages, cities and open country make the computation quite intricate. Intermediate controls and checking stations will be established, and failure to arrive at either at the time calculated by the committee will mean additional penalties. It is expected that a score of cars will start.

ROAD RULES ADOPTED BY PENNSYLVANIA CLUB.

WILKINSBURG, PA., Oct. 19.—The committee on road rules of the Wilkinsburg Automobile Club has given a vast amount of thought to common-sense regulations governing automobile driving on the public roads. Herewith is the approved report of the committee, and the result of its labors will undoubtedly be interesting to many other clubs:

First.—When passing vehicles going in the opposite direction, keep to your right, and when passing those going in the same direction keep to your left-hand side of the road.

Second.—Speed on heavy descending grades should not exceed 15 miles per hour. Brakes should be tested at top of grade.

Speed elsswhsrs always under control; this may bs 4 or 40 miiss psr honr, depending on road and traffic conditions.

Third.—Run slow on a descending grads when passing a car or heavily loaded team ascsnding, giving them the grsatsr right of way. When passing cars on a dusty road, run slowly to prevent dust obstructing the view of the road.

Fourth.—Always sound your horn befors passing a vehicle to give timely warning of your intention to pass.

Fifth.—Do not open your muffler when running on streets where the noise would bs objsctionable to residents.

Sixth.—Approach street or railway crossings under perfsct control, prepared to stop if necessary—"Stop, Look and Listen" before crossing steam railroads.

Seventh.—Approach a horss under psrfect control, prepared to stop if necessary to assist in gstting a timid animal safely past.

Eighth.—Approach curves where view is obstructed under perfect control, expecting to meet a car, keeping well to the right-hand side of the road, sounding the horn frsquently to give warning to approaching vehicles.

Ninth.—When passing farm houses whers poultry ars likely to be on the road, run slowly and give them a chance to get out of the way. Should your car kill any, stop and settle with the owner.

Tenth.—Never pass an nutomobils disabled without stopping ano offering assistance. Every car should carry a manila rope 25 feet long and three-quarters of an inch thick for emergency use.

Eleventh.—Upon observing broken bottiss or glass, barbsd wire or other tirs-destroying material, maliciously placed on the road, stop and remove them. If for epecial reasons a stop cannot bs made, then notify approaching cars of the danger.

Twelfth.—Upon discovering dangerous places in the road, such as holes, land or rock slides, fallen trees, etc., notify the nearsst farm or other house, also ths first hotel stopped at, with the request that motorists bs notified.

Thirteenth.—Light your lamps befors it is quite dark, and when standing on the road after dark bs particular that your front lights show in ths direction of traffic.

Fourteenth.—A continuous sounding of ths horn will be known as a distress signal, and whsn heard by motorists should be quickly respondsd to.

A NEW CLUBHOUSE FOR WILKES-BARRE.

WILKES-BARRE, PA., Oct. 19.—At a meeting of the Wilkes-Barre Automobile Club many things were taken up which are of interest to automobile owners in general. The most important were the plans for a new clubhouse as drawn up by President Lee, who presided at the meeting. He took up the many advantages to be derived from having an up-to-date building of their own, both to the members and their visitors. The results of the work of the committee on roads improvement was shown in the many highways which are either improved or entirely reconstructed in the vicinity of the city; the recent decision of the grand jury, declaring the bridges across the Susquehanna free bridges; and the movement on foot to have a state road to the Delaware Water Gap. The plans for financing the new clubhouse were discussed, and the following committee appointed to take charge of the project: George F. Lee, A. P. Keifer, P. R. Bevan, Charles Bertels, Frank Scouton, and C. F. Huber.

In regard to the hill climbing contest for next year, all members were unanimous in the opinion that everything possible should be done to make it even more of a feature than ever before; in fact, the idea met with great favor of publishing a small pamphlet to be distributed at the shows this winter, containing views of the previous contests, together with a description of Wilkes-Barre and vicinity, and how to get here over the new roads now in course of construction.

MONTREAL AUTOISTS COMMEND AUTHORITIES.

MONTREAL, CAN., Oct. 19.—At a meeting of the directors of the Automobile Club of Canada, held last week, the following resolution was adopted: "Be it resolved, that the president and directors personally, as well as on behalf of the members of the club, desire to congratulate the chairman and members of the road committee of the city of Montreal for the good work which has been performed in repairing and paving the strects of our city during the past season, and express the hope that the committee will be enabled to compete and maintain the good work accomplished."

At the same meeting reports from the various municipalities where oil had been placed on the roads were read, and the directors are much pleased with the results thus far obtained. The placing of oil on the roads not only abates the dust nuisance but preserves the roads, and will cause good macadam roads to last much longer. It is the intention of the club to place oil on several other good stretches of roadway during the early part of next season.

DELAWARE ELECTS SATTERTHWAITE.

WILMINGTON, DEL., Oct. 19.—A definite move for the marking of public road intersections was taken last night at the annual meeting of the Delaware Automobile Association, held in this city, and it was learned that the association is to have the co-operation of some of the turnpike companies. The Kennett Turnpike Company informed the association that it had procured the signs for its road and was preparing to have them put up. Delaware has been lacking in this matter in the past.

The subject of uniform and reasonable toll rates was also considered, the matter being left for adjustment with the incoming officers. The association is affiliated with the Allied Automobile Clubs of Philadelphia.

The following officers were elected for a year: President, John J. Satterthwaite; vice-president, J. Danforth Bush; secretary, Charles G. Guyer; treasurer, William Staniar; executive committee, Joseph Bancroft, Remsen C. Bernard, John B. Bird. Frank S. Garrett, and William F. Sellerd.

The association now has 140 members, the largest number in its history, and is in better financial shape than ever before.

WHAT ONE PENNSYLVANIA CLUB HAS DONE.

MEDIA, PA., Oct. 19.—To-morrow night will be celebrated the second anniversary of the formation of the Automobile Club of Delaware County, whose history of accomplishment, considering its extreme youth, is remarkable. Organized in October, 1906, with 48 members, it now has 220 on the roll, with numerous additions each month. From the start it has worked for the improvement of roads, the passage of favorable automobile legislation in county and town, the stoppage of speeding, the defense of autoists generally against illegal arrest and fines, and in numerous other ways. In two years it has made Delaware county an ideal motoring ground, and it is now engaged in urging and assisting financially in the improvement of the old Baltimore pike. The celebration to-morrow night will take the form of a banquet, which will be preceded by the annual election of officers.

STATE ORGANIZATION FOR MONTANA.

BUTTE, MONT., Oct. 16.—Last week a meeting of representatives from the principal automobile clubs of this State was held at Helena for the purpose of forming a State organization. All the delegates were enthusiastic for a State body which can co-operate with the American Automobile Association for the improvements of the roads, fair legislation and a better understanding of the automobile generally. E. C. Largey, of the Butte club, was unanimously elected president of the new organization, and returned home full of the plans which it is proposed to carry out for the benefit of the autoist.

ORGANIZING OF CLUBS IN MISSISSIPPI.

NATCHEZ, MISS., Oct. 17.—Under the leadership of Robert B. Bridge the automobile owners of Natchez have organized the Natchez Automobile Club. At the first meeting last week the following officers were elected: President, S. H. Lowenburg; vice-president, S. H. L. Landen; secretary and treasurer, W. H. Aikman. In other cities of the State automobile owners are getting together for other clubs.

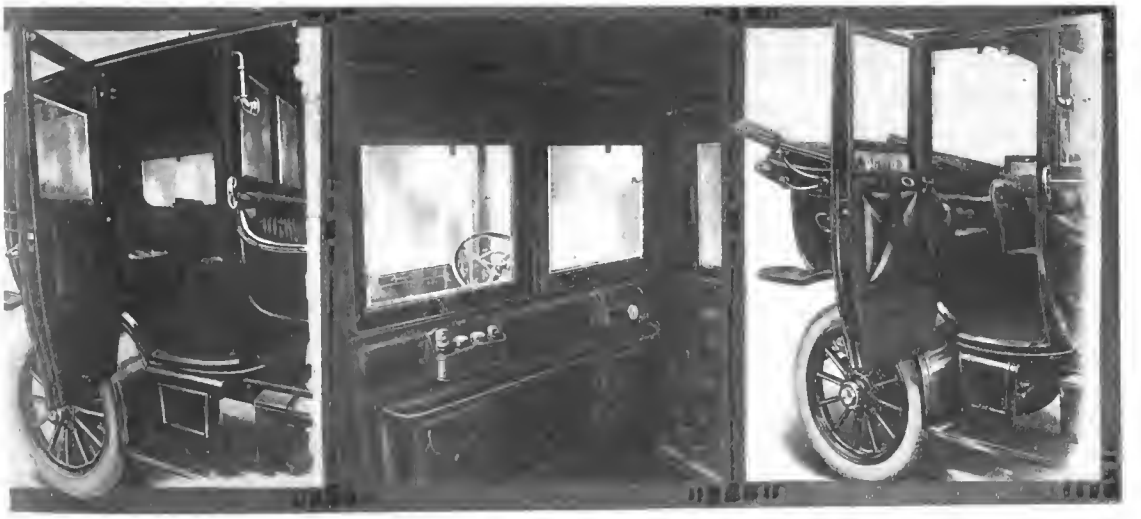
THE INCREASING UTILITY OF THE CLOSED CAR

ever widening demand for the enclosed car has stimulated manufacturers to produce artistic designs and furnishings limousine and landaulet types. The limousine appeals to liscriminating buyers because of its exclusiveness. Planned ilt on a plane of excellence, it appeals strongly to those ave a high regard for comfort and quiet richness and on. To those whose inclinations tend that way, there can greater satisfaction than to realize that a warm and com- c means of conveyance is at one's command, when prep- s are being made to leave home in attendance upon sional and business duties, and the elements of time and e become lessened, if not eliminated, from the mind.

, too, shopping may be easily and speedily accomplished ie greatest comfort, for ladies are conveyed to town and tore to store, and then home again in the shortest time e, and with every convenience at hand. Irrespective of r conditions the children must be taken to school, and not

features have been maintained, yet no new ideas have been set aside because they were new, nor have old features been discarded because they were old. The Peerless limousine offered for the season of 1909 shows clearly the survival of the fittest in motor car building. The tonneau is lighted by two small electric lights of four candle power each. An engagement book, clock, hand mirror and other smaller necessaries are provided, all of which go to complete the equipment of this carefully designed car.

Peerless cars for 1909 are larger, of higher power and more comfortable riding qualities than previous models. The mechanical changes are few and are in degree, not in kind. Each one has been demonstrated by long and careful tests to be a genuine improvement, making the car more simple, reliable, comfortable and more easily managed and cared for. The new body is designed to carry seven people comfortably. Two of the tonneau seats are of the folding types easily detachable and when removed the car is ideal for five passengers.



Showing the Fine Equipment of the Peerless Motor Car Company's Limousines and Landaulets.

d to sudden changes of temperature, and the limousine hly protects its occupants from all climatic conditions.

the sun shines and the days are warm and bright, the s may be dropped in front and at the sides, and thus advantages of the touring car are offered. The back s protection from dirt and dust, and the limousine, while y a car for city use, is thus transformed into an e means of country touring.

ndaulet has the increased advantages that the rear half p may be entirely thrown back, though still maintaining lvantages of the limousine, and the landaulet is becoming popular means of conveyance as the industry develops. tail has been considered with the view of making the limousine weather tight, and yet to allow for perfect n. The most luxurious upholstering is used, and no as been spared in its equipment. Entrance and egress is complished by means of two steps which are carefully to prevent clothes from becoming soiled. A speaking municates with the driver so that he may be directed liverting his attention from the road. The tonneau is enough to carry five people with the greatest degree of

construction of the new Peerless models shows no anges. Improvements take the form of a general of parts as well as their simplified relation. Reliable

NO REGISTRATION FOR UNCLE SAM'S AUTOS.

WASHINGTON, D. C., Oct. 17.—Quite recently a decision was rendered by the Comptroller of the Treasury to the effect that the Federal Government need not pay the District of Columbia authorities for automobile licenses for the numerous automobiles used by the various branches of the Government. This decision has been upheld by the corporation counsel, who likewise holds that automobiles owned by the Federal Government are not subject to a tax by the District government. The latter official has advised the District Commissioners to take no issue on their right to require an official of the United States as "owner" of an automobile to pay the sum of $2 for a license. "I am of the opinion," says the corporation counsel, "that the word 'owner' as used in the present automobile regulations does not include the United States."

The question arose when a bill was sent to the disbursing officer of one of the departments for $2 for a license for the official automobile used by the superintendent of the Capitol. There was some talk of taking the matter to the courts, as there was a possibility that the commissioners might have to issue the licenses without exacting the fee of $2. However, the decision of the corporation counsel has set the matter right by placing Uncle Sam's automobiles on the free list, and there will be no test of the constitutionality of the law requiring a fee of $2 for every license issued to an automobilist.

How the Packard Truck Was Utilized to Break Ground for Factory Addition.

Already possessing what is claimed to be the largest exclusive automobile factory in the world, the Packard Motor Car Company of Detroit is again enlarging the plant by several extensive additions. Several two-story buildings are nearly completed, and ground was broken last week for the first of a series of buildings to be erected on the opposite side of the boulevard from the factory, on a large tract of ground recently purchased by the company.

Between the Twin Cities and Duluth.—While scouting around the country looking over possible roads for the Glidden tour of next year, the Studebaker "Scout" car, with Donald J. McIntosh and "Pete" Estey, last week made a new record between the Twin Cities and Duluth, covering the 174 miles in 7 hours 32 minutes running time. Dr. C. E. Dutton, chairman of the tours and contests committee of the Minneapolis Automobile Club, and R. E. Tucker, automobile editor of the Minneapolis *Tribune*, were in the car and made a careful log of the trip. All kinds of roads were encountered and the record of 7 hours 32 minutes shows that some fast driving was done by McIntosh, who has something of a record as a "speed peddler." Sand predominated, in some places being six and seven inches deep. There are several stretches of corduroy road, some sharp hills with sand, and about fifty miles of the distance is good turnpike where the time can be made. The hotel accommodations in the Twin Cities and Duluth are ample, and everything considered the Glidden tourists would be given a cordial reception in the Northwest.

Lubrication for Racing Cars.—W. T. Kincaid, representing A. W. Harris Oil Company, Providence, R. I., who was in New York attending the Sweepstakes races, where he furnished a number of cars which made a good showing in the different events, including two winners, says that his company is very proud of the record made by Harris oil in this year's racing, giving the following noteworthy performances: The road races at Savannah, Briarcliff and Lowell; Motor Parkway Sweepstakes, where the Buick and Isotta both won their events; the last 24-hour race at Brighton Beach, in which the Simplex made a new record; the 24-hour race at Milwaukee, won by the Locomobile, with a Mitchell second; Bridgeport hill climb; 100-mile stock car race at Elkwood Park, and Ralph De Palma's car, which made new records at Providence on October. 10.

Matheson Annual Meeting.—At the annual meeting of the stockholders of the Matheson Motor Car Company, held at Wilkesbarre last week, the withdrawal of Charles W. Matheson from the presidency to assume the presidency of its selling company, the Matheson Automobile Company, necessitated the election of a new president, Colonel Asher Miner being chosen to succeed him. J. W. Hollenbeck was elected vice-president, Frank Matheson was again chosen as secretary and general manager, R. Nelson Bennett was re-elected treasurer and Daniel C. Mackay, assistant treasurer. The list of directors is the same for this year as for last, except that John C. Bridgman, of Wilkes-Barre, Pa., and E. S. Fretz, of Pottstown, Pa., were elected to fill the vacancies caused by the withdrawal of the Palmers of New York City. The list of directors now includes: J. W. Hollenbeck, I. M. Thomas, John A. Turner, Asher Miner, W. C. Shepard, B. Nelson Bennett, W. H. Son, Frank Matheson, Charles W. Matheson, John C. Bridgman and E. S. Fretz.

A Successful Mountain Trip.—What proved to be a thoroughly enjoyable trip, as well as a strenuous test for the car, was recently completed by Richard M. Shaffer of the Shaffer Manufacturing Company, Baltimore, Md. The tour was through the mountains of West Virginia, Maryland and Virginia, where the road conditions at times were not all that could have been wished for, in fact between Hancock and Cumberland, where the route passed over five mountains, the roads were so stony as to be almost impassable. On the return trip between Winchester, Va., and Berkeley Springs, W. Va., the sand at times was the worst ever encountered by Mr. Shaffer. In all he covered about fifteen hundred miles, using a 1907 Pullman of 20-horsepower, with which he had no trouble, being lucky enough to escape without even a puncture.

A 1,600-Mile Road Test.—A sealed bonnet test of the new $1,600 Jackson car is to be made during a trip from Jackson, Mich., to Bangor, Me. The start will be made next Monday. The passenger list will embrace E. P. Blake, of Boston, New England distributor of the Jackson; Richard Palmer, of Sea Neck Park, N. J., and Dr. C. G. Percival, of New York, the company's publicity manager. Arrangements have been made for reception of the car by the four organizations of Philadelphia, Boston, Portland and Bangor. The idea is to have newspaper men in the car as checkers all the way from Jackson to the finish at Boston on November 1. A schedule averaging 200 miles per day has been framed up in the 1,600 mile trip.

A Story from the West.—Here is a story from out of the West, brought to Chicago by W. K. Cowan, Rambler representative for Thomas B. Jeffery & Co., Los Angeles, Cal.: Two California motorists, traveling in opposite directions, met in a collision on the public road. Both were thrown from their cars but neither was injured, though both cars were badly damaged. "I'm going to sue you for damages," cried one when he got his breath. "I'm going to sue you for damages," shouted the other, wiping the sand out of his eyes. "It was your fault," said one. "No, it was your fault," said the other. "Well, it will cost us $250 apiece to get our cars fixed," ventured one. "And it would cost us $1,000 apiece to bring suit," said the other. "In that case, let's shake hands and save $1,250 each." They did.

Mooers Building Taxicabs.—Louis P. Mooers has entered into the exclusive manufacture of taxicabs and town cars for the Cleveland Autocab Company, of Cleveland, which has established a large plant at Geneva, O., with capacity for a large number of cars. Mr. Mooers is well known to the automobile world as the designer of the Gordon Bennett Peerless racers and Barney Oldfield's Green Dragon. He was until recently the superintendent and designer of the Moon Motor Car Company of St. Louis.

One Agent's Good Scheme.—To create a profitable rivalry among his chauffeurs H. Bartol Brazier, Philadelphia agent for the Marmon car, has offered a gold watch to the chauffeur in his employ, or in that of an owner who stores at his garage, who can show the most economical operation for November. A similar contest last May was closely contested and was won by Ralph Green.

The Rome-Tourney Radiator Company, formerly known as the Long-Tourney Manufacturing Company, of Rome, N. Y., has changed its name for various reasons. The capacity of the plant has been tripled and the output for 1909 will reach 50,000 radiators. In addition a quick repair department has been provided, where the company will take care of any make sent in for that purpose.

A Large Tire Contract.—What is probably one of the largest tire contracts ever given to a tire company has just been made by the Ajax-Grieb Rubber Company, which has agreed to deliver to the Maxwell-Briscoe Motor Company 29,000 tires before July 1, 1909. These 7,250 sets will be used as standard equipment on Maxwells in 1909.

Pennsylvania's Tags.—Over 24,000 automobile tags have been issued by the Pennsylvania State Highway Department during the present year. The 1909 tags, which will be ready for delivery by December 15, will be white with black lettering. It is expected that nearly 30,000 of the new tags will be required.

IN AND ABOUT THE AGENCIES.

Stoddard-Dayton Agencies in South America.—Sigmund Krausz, who has been acting as a South American representative for the Dayton Motor Car Company, has established Stoddard-Dayton agencies in Havana, Rio de Janeiro, Montevideo and Buenos Ayres.

Mr. Krausz found that the European makers had a good foothold in South America, but he succeeded in convincing the dealers that the American car of today is a worthy competitor.

Rambler, New York City.—Manager Hutchinson, who has charge of the agency department of Thomas B. Jeffery & Co., while in New York recently completed arrangements for the establishment of a wholesale distributing house for the Rambler in the East. The upper floors of the building occupied by the local agents, Homan & Schultz, on Sixty-second street, near Broadway, will be utilized. The present agent will look after retail sales and retain its present territory.

Firestone Tires, Boston.—The Boston branch of the Firestone Tire and Rubber Company, which has been located at 9 Park square, has removed to 145 Columbus avenue, the store formerly located by the Rambler agency. Manager T. J. Glenn is making extensive alterations, which, when completed, will give the Firestone agency much larger quarters than heretofore.

Pope, Los Angeles, Cal.—The Pope interests in Los Angeles will be handled by the newly-formed William R. Ruess Automobile Company, situated at 1028 South Main street, after November 1. This company is making extensive improvements which when finished will give it one of the finest salesrooms and garages on the Pacific coast.

Pierce Arrow, Baltimore.—The Foss-Hughes Motor Car Company, agent for the Pierce cars in Philadelphia and vicinity, has established a branch in Baltimore, with temporary offices in the Equitable Building. Frederick E. Devlin will be in charge.

Franklin, Cleveland.—The Standard Automobile Company, agent for the Packard, has taken on the Franklin line for 1909. F. A. Stock, of the former Franklin agency, has accepted a position with the Standard company.

Grout, Philadelphia.—The Grout Automobile Company has recently closed a deal whereby the Stoyle Automobile Company, of 1521 Spring street, will act as Philadelphia agents.

American, Pittsburg.—The Pittsburg interests of the American Roadster will be looked after by P. C. Wood and R. G. Wood, who have opened salesrooms on Wood street.

Franklin, Greenville, S. C.—C. M. Wing, of Greenville, S. C., has taken the agency for the Franklin car, and will be located at his new garage on Buncombe street.

Diamond Tires, Seattle. — C. E. Mathewson, Pacific representative of the Diamond Rubber Company, is preparing to establish a branch at Seattle, Wash.

Baker Electric, Wilkinsburg, Pa.—The Wilkinsburg Auto Garage, located on Hay street, have secured the agency for the Baker Electric.

Overland, Boston. — Hereafter the Overland interests in Boston will be taken care of by J. M. Linscott.

PERSONAL TRADE MENTION.

E. Le Roy Pelletier, advertising manager for the E-M-F and Studebaker Automobile Companies, was in New York last week. Mr. Pelletier is making a tour of all the larger cities visiting the E-M-F representatives and Studebaker branch managers. His trip will not only take him through the South and East, but before he returns to headquarters again he will have visited Los Angeles, San Francisco, Portland and Seattle, besides a number of places along the northern route on his return from the West.

Frederic Coleman, for several years manager of the London branch of the White Company, arrived last Friday on the Mauretania for a short visit to this country. Mr. Coleman has been active in making the White steamer prominent in England, and on his arrival here spoke very optimistically of the outlook in the British Isles for the coming season.

Harold Stillman, who has been a prominent figure in the automobile trade in Philadelphia for some years, died at his home in Hartford, Conn., after a two-weeks' illness with typhoid fever, which turned into peritonitis toward the end. Mr. Stillman had been successively connected with the Mercedes, the Pennsylvania, and later the Foss-Hughes Company.

Olds to Become an Aviator.—Another convert to aerial navigation has been obtained in the person of R. E. Olds, president of the Reo Motor Car Company. He is scheduled to make a flight in company with Charles J. Glidden, at Springfield, Mass., on or about October 24.

F. B. Read, for the past four years with the selling department of the Springfield Metal Body Company, Springfield, has severed his connection to accept the position of assistant manager of H. J. Koehler Company, of Newark and New York City.

Arthur Holmes, assistant mechanical engineer for the H. H. Franklin Mfg. Co., who is visiting the Franklin agencies through the West, including the Pacific Coast States, sends word that the automobile business in that section is very active.

Thomas R. Roberts, who has been acting as assistant manager of the Philadelphia branch of Thomas B. Jeffery Company, has been made manager in place of William F. Smith, who has resigned.

Frank L. Kimball, who has been connected with the Chicago branch of the Autocar for some time, has gone with the Bird-Sykes Company, agents for the Matheson and Corbin in that city.

Charles W. Mears, of the Winton Motor Carriage Company, is making a tour of the East investigating the advertising situation at the different Winton branches.

C. W. Moody, who has had charge of the Pennsylvania Rubber Company branch at Cleveland, O., will hereafter be in charge of the Western territory, with headquarters at Chicago.

Fred McAllister, former automobile advertising manager of the New York *Sun*, has joined the motor car advertising department of the New York *Times*.

BUSINESS DIFFICULTIES.

Baker Company of New York.—The Baker Motor Vehicle Company of New York, doing business at 1788 Broadway, was last week forced into involuntary bankruptcy by the action of some of its creditors. This action had been anticipated for some time, in fact ever since a year ago, when the business formerly carried on by the C. B. Rice Company was reorganized and carried on by the new company in the hope of working out the debts which had been contracted under the old management. It was impossible for the company under the business conditions existing for the past year to operate at a profit and the creditors deemed it advisable to cause the liquidation of the company. This company has no relation to the Baker Motor Vehicle Company of Cleveland, except that it sells the cars made by the last mentioned company. As soon as the bankruptcy proceedings are ended it is expected that the business will be completely reorganized and carried on with new capital put into it. Liabilities are placed at $100,000 and assets from $20,000 to $30,000.

RECENT INCORPORATIONS.

Standard Universal Rim Company, Jersey City, N. J., to manufacture and deal in metal rims and parts. Capital $50,000. Incorporators: B. S. Mantz, J. R. Turner and S. A. Anderson.

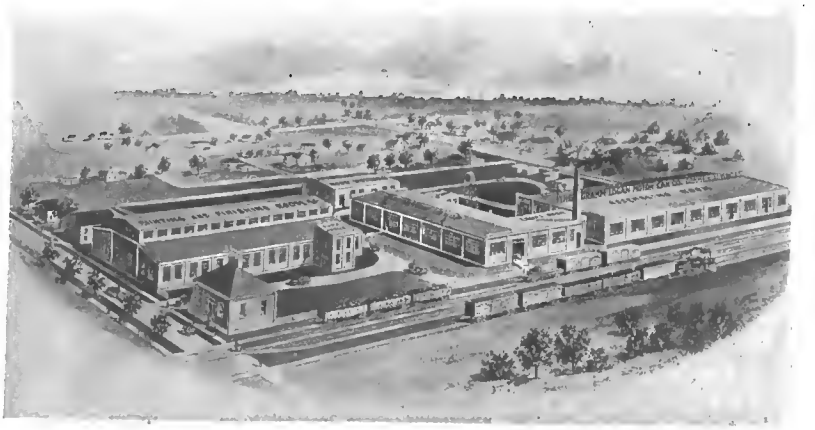
Rex Electric Company, of Kingston, N. Y., manufacturers of electrical lamps. Capital $600,000. Incorporators, E. M. Betts, C. J. Kleber and B. B. Maloney.

Champion Tire Company, Syracuse, N. Y.—Manufacture tires. Capital, $100,000. Incorporators, Q. C. Reed, E. O. Kinne and S. G. Schlachter.

Preston Fabric Tire Company, Buffalo.—Capital $100,000. Directors are Christian Wesp, M. R. Evans and J. F. Preston, of Buffalo.

Southern Tier Motor Company, Elmira, N. Y.—Capital, $25,000. Directors: G. N. Shoemaker, C. S. Satten and H. K. Crandall.

G. H. Pexley Company, Boston.—General automobile business. Capital $50,000. Charles H. Tebbetts, Marshfield, president.



New Factory of the Gramm-Logan Motor Car Company, Bowling Green, Ohio.

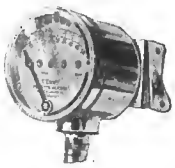
INFORMATION FOR AUTO USERS

Stewart Speedometers for 1909.—The Stewart & Clark Mfg. Co., of Chicago, maker of Stewart speedometers, announces that a number of attractive features have been added to the regular models, and that the line has been increased by two new models. A reduction in price in the 75 ninety-mile model to $50 is announced. Both this and the 90 model will have a new and unique trip recorder of three dials indicating the mileage in miles and tenths, with an automatic resetting device, different in construction to anything of the kind on the market. These models will be equipped with maximum speed hand. A feature of the mechanism operating the trip and maximum hand is the elimination of springs and other devices liable to derangement.

STEWART MODEL 4.

The new models are No. 11, at $25, and No. 12, at $15. The $25 model, which is of new construction, indicates speed from 0 to 60 miles and has a new trip recorder and resetting device. Owing to the indicator being mounted in the center of the dial, the scale is three times as long as is ordinarily used. The $15 model, which is the same in design as the $25 model of last season, has a 50 mile scale and 10,000 mile season odometer. It is three inches in diameter and has a number of refinements in construction, which its makers believe will insure satisfaction.

MODEL 11.



MODEL 12.

TWO NEW STEWART SPEEDOMETERS FOR 1909.

All models will be equipped with the Stewart & Clark flexible shaft and swivel joint and are guaranteed absolutely for five years.

New Rear Lamp.—A new rear light, known as Foy's patent automobile rear light, is being manufactured by Meisel Press & Mfg. Co., 944 Dorchester avenue, Boston, which has some special features. It is an electric lamp which fastens permanently to the rear of the car, and may be lighted by any ignition battery, bulbs being furnished for either 4-6 or 8 volt batteries. The globe is held in place by two spring terminals which, the makers claim, will prevent any possibility of the globe loosening or dropping out. As shown by the accompanying illustration, the light is placed horizontally and parallel with the back of the car, thus throwing the light well over the number plate, and through the ruby light, which is directly in front. The rear half of the lamp box is hinged to facilitate cleaning the silvered reflector. The number plate holder attached to the lamp is made so that it will take any size State number plate without the use of any tools, because of the spiral springs which hold the plate in place.

FOY AUTOMOBILE REAR LIGHT.

"Myhtib" Tire Overcoat and Inner Tube Patches.—The Myhtib Composition Company, of Hartford, Conn., is producing a preservative for the outer shoe or casing of tires which is of especial interest to automobile owners. Anyone familiar with rubber tires knows that they will deteriorate and lose their life if left standing unused for any length of time, the rubber being kept in much better condition if the tire is in use. The manufacturers of this new composition claim that when the "Myhtib" overcoating is used this loss of life will not take place. They especially recommend it for use when a car is jacked up for the winter, and also to dealers who carry cars in stock for two or three months with tires on before sold; also for keeping the extra tires carried on the car in the best condition. This "tire saver" comes in an outfit composed of a cake of "Myhtib" composition and a bottle of "Myhtib" preserver; the cake being melted and applied while hot.

TRADE-MARK OF THE MYHTIB PATCH.

This company is also making a tire patch which has the good qualities of being sold with the cement on in shape to be applied to the injured spot, and the consequent feature that the patch may be put on in three minutes. The patches are sold in one size only, 2¾x2⅜ inches, and are placed in boxes of five.

Oildag.—The Acheson Oildag Company, of Niagara Falls, N. Y., are manufacturing a mixture of deflocculated unctuous graphite and oil, which they claim will not only reduce the oil consumption, but increase the power of the engine and prevent pitting of valves when used according to their instructions. This mixture is in the form of a paste, and when mixed with the quantity of oil specified on the package it gives an amount of graphite content to the oil equal to .35 of one per cent. of its weight. This is the same as though you took one cubic inch of solid graphite, divided it into molecules, and mixed it with three gallons of oil. It is said that instead of the usual 200 miles per gallon of oil, as advised by a number of car builders, a machine using Oildag will do over 600 miles on one gallon of oil. Because of the graphite, which, as an impalpable powder, is carried by the exhaust and deposited on the metal surfaces, the claim is made that all future pitting is effectually prevented. The product is put up in three sizes of packages, the smallest enough for one gallon of oil, one for five gallons, and the largest for ten gallons.

Thomas Shock Absorber.—The shock absorber shown in the illustration is manufactured by the Buffalo Specialty Company, which has bought the plant of the Thomas Spring Works, Canisteo, N. Y., and transferred all the machinery, patterns, etc., to one of its Buffalo factories, where the manufacture of Thomas shock absorbers will be extensively carried on. A number of improvements have been incorporated into the device. Among the advantages claimed for this form of shock absorber might be mentioned the increased ability of the lever arm of the spring by the length of the lever arm to the point of application of the force. This same length of lever arm will reduce the periodicity of the oscillations. The makers point out that the shock absorbers afford the snubbing phenomenon during the period of reaction only. In this way the tendency to disrupt the spring leaves will be less, if not entirely eliminated, while the rebound, which is the matter to be considered, falls off to very comfortable proportions. The very fact that the periodicity of the oscillations would be reduced by the length of the lever arm tends to reduce the lateral rolling of the body, which in itself is an extremely important matter. Obviously this device should occupy an important nich by way of an accessory to the automobile, if it will reduce the rebound and more or less eliminate lateral rolling. It is not alone in the matter of spring breakages that these disagreeable factors have to be noted, but because the rack shock and the products thereof are by way of considerable increase in the cost of upkeep of the cars. The makers of this shock absorber claim that they very materially reduce the factor of upkeep.

IMPROVED THOMAS SHOCK ABSORBER.

THE AUTOMOBILE

American Winner of Vanderbilt Race

1st—LOCOMOBILE - - - - 4:00:48⅕
George Robertson

2d—ISOTTA - - - - - - - - - 4:02:36⅖
Herbert Lytle

Average Speed - - - - - - 64.3 m. p. h.
Fastest Lap - - - - - - - - 69.4 m. p. h.

AMERICA has at last come into her own. An American car, designed by an American, built by Americans in an American factory, of American material, and driven by an American, finally won America's classic contest in this the fourth year of the stubborn perseverance of Americans to place American cars on a speed level with the product of Europe.

The Vanderbilt Cup race of 1908 has been run and won by a Locomobile, designed by A. L. Riker, built

The Isotta, Lytle Driving, Which Finished In Second Place, With a Fine Record for Consistency.

y the Locomobile Company of America, and driven by George obertson, of New York, Saturday, October 24, over eleven laps f a 23.46 miles course, an out-and-out American combination volved a triumphant winner. The 258.06 miles, made up of Nasau county roads, except for some nine miles to the round of the ong Island Motor Parkway's cement stretch so far completed, as covered in 4:00:48 1-5. The fastest lap of the race, 20:17, an verage of 69.49 miles per hour, also was credited to the Locoobile. The average scored was 64.38 miles per hour, a new ecord for American roads, beating the previous best record f 64.25 miles, made by Herbert Lytle with the Isotta in the lotor Parkway Sweepstakes over the same course two weeks efore. More to the point, however, is that the result of the ace transfers not only an American record held by a foreign ar with an American driver, but also a hitherto best Vanderlt Cup average, scored by an out and out European combinaon, to an utterly American aggregation; for the Locomobile id Robertson also beat the 61.49 miles average scored by the arracq and Hemery in the 1905 race.

The average put up by the Locomobile and Robertson far utstripped the other records of this season's road races in this ountry, in addition to the Sweepstakes figures. Louis Strang, the triple-winning Isotta, averaged 50.70 miles at Savannah, 5.15 miles at Briarcliff, and 53.6 miles at Lowell.

The runner up Cup honors fell to the Isotta, hitherto unbeaten in any road race this year. With Herbert Lytle at the heel, this marvellous little racing craft finished in 4:02:38 2-5, ith an average of 63.88 miles per hour, but a fraction below s record performance in the Parkway Sweepstakes. It lost rst honors by but 1 min. 48 1-5 sec., putting up the closest ace in the history of American long-distance racing, surpassing ven the closeness of the memorable struggle between George eath and Albert Clement in the first Vanderbilt event.

Following Lytle's finish the crowd swarmed over the homeretch and was reported as also to have overrun the outlying ourse. Accordingly, Referee Vanderbilt called the race off s a precautionary measure of safety. Two pilots, however, readed their way through the maze of people and finished. hey were Walter Luttgen in W. K. Vanderbilt, Jr.'s, Merdes and "Jim" Florida in Locomobile No. 1. Unofficial but eliable timing gave 4:30:35 to Luttgen, who had crossed the ne unhampered. On the other hand Florida was hemmed in y the crowd and long delayed. There would seem to be no oubt of his having finished third. Allowing him three minutes or his delay, his time would be 4:28:10. Even had but two minutes' delay been granted him, he would still have finished ahead of the Mercedes pilot.

In enthusiasm and enormous attendance, it was the same old Vanderbilt Cup race. As a contest it was the best race ever run for the cup and the fiercest fought battle an American road race has ever produced. At the end of the seventh round, when 164.22 miles had been run, ten contestants were still fighting it out. Six of them at this point had yet winning chances, less than 15 minutes separating the leader from the tail-ender of the sextette. These ten were still running when the race ended.

George Robertson and Willie Haupt divided the honors of leadership, the Locomobile setting the pace for three rounds and then the Chadwick captured the running for the next three laps. The Locomobile had experienced slight delays, but they were sufficient to put it back in the ruck, so close was the contest among the leaders. Throughout the race the Isotta, running steadily and consistently from start to finish under Lytle's able pilotage, never lost its position in the pacemaking trio. Emile Stricker was also in frequent evidence in second and third place with Robert Graves's Mercedes until the tenth round, when the Mercedes entered by the cup donor got a grip on third place that was not shaken off until the last lap.

Robertson gained the lead in the seventh lap. The last five laps of the race was made up of an exciting duel between the Locomobile and the Isotta with from but two to four minutes separating them at any time. Robertson entered the last lap with but 3 min. 50 sec. to his credit over Lytle. Soon after word came that the Locomobile had stopped near Jericho on the backstretch. The grandstand was thrown into a turmoil of excitement and fairly seethed with suspense until a second megaphone bulletin told of his being off again with but a loss of about two minutes he had taken to replace a tire.

When Lytle and his Isotta had flashed by the stand first past the post, there followed minutes of anxious waiting and pent-up excitement that no race ever run in America before had ever called forth. Robertson had started ten minutes after Lytle and so had that margin in which to finish. Watches were out and anxious eyes shifted from them to the hill up the stretch. Five, six, seven minutes passed and no Robertson. Eight minutes, and a mighty shout went up as the big radiator of the Locomobile showed itself over the hilltop. It took but seconds for Robertson to dash down the homestretch and across the tape.

There were seconds of tense waiting for the final word from the timers' stand. It came and then there arose such a mighty whole-souled cheer and shout of triumph from the grandstand

and the thousands along tbe homestretch as no Vanderbilt Cup finish had ever called forth before. It was a mighty howl of glee and victory over America's first great road racing triumph. That stupendous cheer raised the curtain on a new era for America in international racing. Long patience and stubborn perseverance had at last won out and America was no longer a second-rater among the motor car racing nations of the world.

A wet course during the early stages of the race interfered somewhat with the speed attained by the contenders, otherwise the record would doubtless have been beaten by a broader margin than it was. It had rained for two hours before tbe start and the rain continued well into the second round.

Though the new course was less accessible than the old circuit and the location of the grandstand was remote and unfamiliar, as has been said above, the same old monster Vanderbilt Cup race crowd was in evidence. It probably did not equal the migbty throng that swamped Nassau county in 1906, but it reached the hundred thousands and maintained the prestige of the Vanderbilt Cup as America's greatest sporting event.

The race was utterly without fatalities and absolutely free from injuries to contestants beyond the singeing of Foxhall Keene's moustache during his attempt to put out a fire on his Mercedes. In fact, an accident apiece to cars and spectators was the sum total of casualties to onlookers. "Jim" Florida at the finish bumped into a touring car and damaged its radiator and in the mix-up a young man was thrown to the ground and had his leg broken.

To tell the unvarnished truth, the preparations that had been made to bandle the crowd and guard the course proved to be inadequate. The instinct of self-preservation did more to save the crowd from injury than did the private militia company that had been obtained or the Pinkerton men and the deputies that had been hired. There was an insufficient number of guards to make the wire fence barrier efficient. Hundreds scaled it and crowded those that had paid big prices for choice parking spaces along the homestretch. At the finish there was a rush of hundreds to the space in front of the grand and official stands. The supply pit hose pipes were brought into play with some momentary success, but they only checked the onrush temporarily and then the homestretch was again overrun, and Referee Vanderbilt was compelled for safety's sake to call tbe race off with the passing of the victor by the tape. There was also confusion anent the directions for reaching the parkway entrances and parking spaces. To most automobilists tbe region of the parkway and tbe location of the toll gates were unfamiliar. As these entrances had to be reached at night time, the route to them might have been indicated by guiding signs along the various roads of approach.

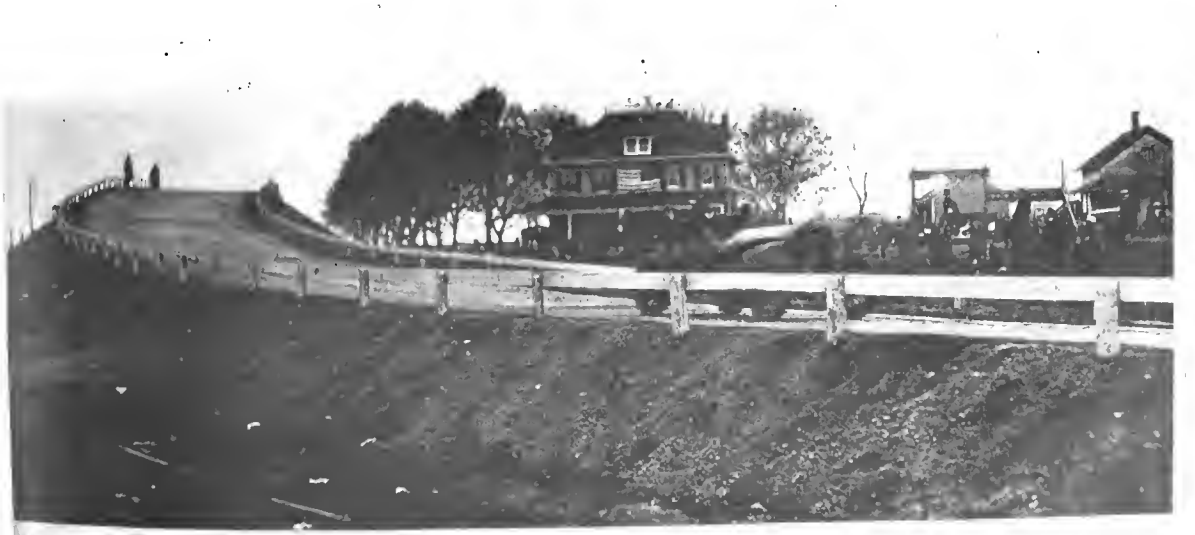
The arrangements for the conduct of the race itself and the convenience of officials and newspaper men, however, left no ground for complaint. The telegraph and telephone service on the press stand were pronounced adequate by the scores of newspaper men who had come from all sections of the country.

So far as crowds of foot passengers and numbers of automobiles went, the Vanderbilt Cup race of 1908, generally speaking, was not behind the average of its predecessors. No guesser witb any regard for truth and reason will attempt to assert that the throngs of people and cars equaled or even approached the attendance at the cup race of 1906, when transit facilities were swamped, and for a week before the race there was a steady pouring of machines into town from a radius of 500 miles.

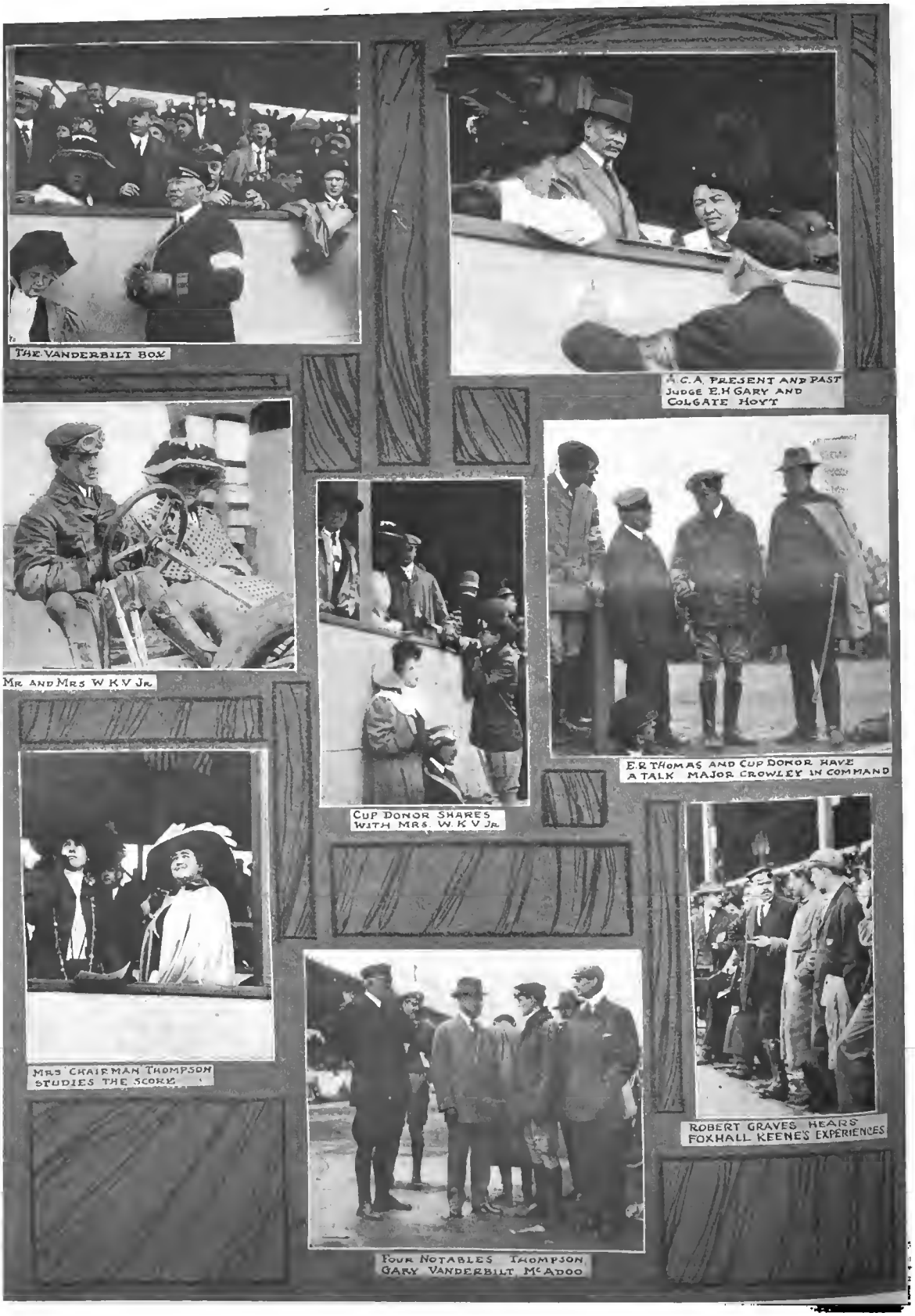
The absence of the foreign makers and drivers from the contest resulted in a falling off of visitors from distant points, and, of course, of parties that toured to Long Island. Still all automobiledom in the metropolitan district was on band with its cars and that means the Greater New York and nearby Jersey furnished fully fifteen thousand machines. The daily newspaper guesses at the crowd hovered around 200,000, but that was, of course, mere guess work. There were fully 5,000 people in tbe grandstand and easily twice as many more packed along the homestretch in its immediate vicinity. There were thousands gathered at eacb of the towns and turns, and all around the circuit was a fringe of onlookers.

The road race goers of New York demand the novelty and adventure of an all night pilgrimage or encampment. They would not leave at 6 o'clock to see the start of the Sweepstakes at 9 o'clock. They welcomed the chance, however, to camp out all night on Long Island, or to start from the Rialto at midnight to see the Vanderbilt Cup race.

There were the same old familiar midnight scenes in the Broadway hotels and cafes, the late suppers, and the early breakfasts of the sporty element that was out for a racket and wanted to make sure of being properly keyed up. During the night two bridges and two ferry companies transported considerably over 4,000 cars. Add to these fully as many more that drove to the course from Broadway and then include the thousands of machines that had traveled to Long Island during the week, or had started earlier in the afternoon to put up at the various Nassau county hotels and farm houses, and the estimate of 15,000 cars to view the race would not seem to be an exaggeration.



Unofficially, the Third Car Was Undoubtedly No. 1 Locomobile, Driven by Florida, Which Ran Into Unruly Crowd Near Grandstand.



THE VANDERBILT BOX

A.C.A. PRESENT AND PAST JUDGE E.H GARY AND COLGATE HOYT

MR AND MRS W K V JR

CUP DONOR SHARES WITH MRS. W.K.V JR.

E.R THOMAS AND CUP DONOR HAVE A TALK MAJOR CROWLEY IN COMMAND

MRS CHAIRMAN THOMPSON STUDIES THE SCORE

ROBERT GRAVES HEARS FOXHALL KEENE'S EXPERIENCES

FOUR NOTABLES THOMPSON GARY VANDERBILT McADOO

How the Race Was Contested Won, and Lost

IE weather-wise man at Washington had forecasted rain. But not a drop of it came during the long , in which the mechanics and motor sharks were with the final touches to their charges at the train- amps around the circuit, and there were hopes of a day and course for the race after all. But at half four o'clock, when the captains of the camps had about called from dreams of conquest and glory and night- s of punctured tires and magnetos that would furnish no the men on whose courage and skill the fate of each army was to depend, the dread drops began to fall and soon oped into a steady and what seemed a hopeless rain. There a hustling for rubber togs and a digging out of anti-skids. in the next hour the racing machines were en route to the e and the squads of tire tossers and oil jugglers to their s at the grandstand pits and the backstretch supply station. e first cup candidate to reach the starting line was George an in the Thomas, who got there at half past five o'clock. rs followed in quick succession and soon the number was ient for "Wag" to begin his task of getting them in their s in the starting line. Referee Vanderbilt and Chairman pson were also on hand in water-proof jackets, "knickers," puttees" to answer a hundred questions. Long before 6.21 ., the hour originally set for the start, the hustling starter he cup candidates lined up. Then came the announcement he start would be made at 6.30. The rain had ceased, but tening clouds dimmed the dawn. Even at this hour the and stand were well filled and black lines of intruding ands swarmed among the hundred automobiles to the east tretched in solid walls to the hill to the west a half a mile

the appointed hour grew near, the starter took his stand Locomobile No. 1. Charley Dieges and Sam Butler were with chronometer and note book. This time it was good ankee "ten, nine, eight," and not "dees, nuff, weat, set," n which "Wag" prided himself at former races, for this a bunch of American pilots unadulterated by any famous n mixture were to be sent away.

ven, six, five, four, three, two, go" and Jim Florida was off e great race of 1908 was on. There was applause as each ot away, but the first big cheer went to Lytle, who was to start. Ryall, Seymour, and Kilpatrick were dispatched er without incident. Then came a gap, for Pouget and the r were missing. En route to the course Mr. Whitney's d had the ill-luck to break its steering gear. Robertson, vorite, got away amid a mighty roar of encouragement and ishing. Hardly less of a demonstration started for Strang, was nipped in the bud by the inability of his mechanic to the Renault. There was a scurrying of camp followers rescue, a lifting of the bonnet, and further desperate crank- it still the stubborn spark could not be coaxed into life. time for the next "get-away" and the referee hastened to with willing shoulder to push the car to the side of the

Magneto trouble had been its undoing. During Strang's e in town the evening before, so the story goes, a new o had been put in. At the start its interrupter had panned fective and refuse to work. Finally, in despair the car shed back to the Renault pit. Twenty-eight minutes later it was gotten going at last and Strang started with a hopeless half hour handicap to make up. Strang and La Croix are popular and the tardy luckless Renault that suffered misfortune through accidents in both the Brighton Beach races got a cheer of good fellowship.

First Lap (23.46 Miles).—With all the seventeen cars under way came a craning of necks up the stretch for the first car that should heave into sight. There was less than five minutes of waiting, for at 6.53.10 "Jim" Florida in the pacemaking Locomobile shot by, having completed the round in 23:10. Next Stricker in Mr. Graves's Car, the Jenatzy Mercedes having overhauled and passed the Dennison Knox, which had started second. "Willie" Haupt was also burning up the road with the Great Chadwick and had also gotten by the Knox. All the time Robertson was climbing up the steps of the racing ladder, and though Chevrolet, too, was hitting a hot pace with the Matheson and had started a minute a head of the Locomobile, it was cut down by the favorite. Word came from the backstretch that Mercedes No. 18 was afire, the gasoline having ignited. It was another case of bad luck for Foxhall Keene, who in 1905 race had banged into a telegraph pole on the hairpin turn. He finally extinguished the flames and finished his first lap after the leaders had completed a couple of circuits.

Robertson completed his first round in 20:54 and in actual time was the leader in the race. As he finished his lap he slowed down to his pit to take on water and oil. It was feared from his seeking fuel so early that his engine was heating, but he was up and away again in less than two minutes. Already Robertson had gathered a margin of but a couple of seconds less than a minute on his nearest pursuer, the Isotta. Lytle and Haupt had had a neck and neck race for the place, the former capturing it by a second. They were being chased by Chevrolet and Salzman less than fifteen seconds behind them, the Thomas leading the Matheson by but fire seconds. Florida, Patschke, and Luttgen followed in order. The field was running well, only Keene have encountered any obstacle. Despite the slippery going, the leading trio were running among the records, Robertson with an average of 67:3, and Lytle at a 64:50 miles rate.

Second Lap (46.92 Miles).—The speed honors of the second round fell to Haupt and Lytle. The Chadwick by a lap in 21:29 made up the one second lead and gained 4 seconds besides on the Isotta. Stricker was making a splendid run in the Mercedes and put up a 21:58 lap to his credit. Despite his stop for water, which came out of the second lap, Robertson had spurted so hard that his gross for the round showed 22:15, and he still held the lead by a margin of 15 seconds. Florida, too, was well holding up his end of the Locomobile plank in fifth place, and Salzman and the Thomas hung stubbornly to the sixth. This sextette was running with a margin of but three minutes separating the first and last man. The indomitable Keene made a plucky run after he had extinguished the fire in his carbureter,

Vanderbilt Mercedes Ascending a "Hill" of the Parkway.

No. 2 Knox Overhauling No. 6 Grand Prix Thomas.

No. 12 Thomas Best of the Buffalo Trio.

No. 7 Matheson Which Had Its Share of Misfortune.

covering the second lap in 22:32. Strang had gotten the Renault going, but it was somewhat in the doldrums and no greater speed than 23:58 could be gotten out of it. In this round Chevrolet's fight in the Matheson was stopped for good by a cracked cylinder, and the Baltimore youth, Howard W. Gill, had his road racing début nipped in the bud by the gears of the Thomas refusing further to work. Chevrolet had made a fine first lap in 22:09, and the Matheson's downfall greatly disappointed those who had expected much from the new Matheson racer.

Third Lap (70.38 Miles).—It had rained a bit during the first lap, but had let up during the second. By the third round the sun, though veiled by mist, showed itself and set to work to dry out the course and made good progress. With his signal men informing him how close were the Isotta and the Chadwick at his heels, the daredevil in Robertson's make-up asserted itself and he put spurs to his motor steed. He had made laps in practice over a dry course in 20 minutes, but he still had a wet and slippery road ahead of him now. So daringly did he take the turns and so unerringly did he pilot his flyer down the straights along the country roads and over the "roller coaster" hills of the cement stretch, that he took unto himself the fastest lap in the race—a 23.46 mile round in 20:17, showing a rate of 69.6 miles per hour. Even at that rate of going the Chadwick in 21:27 was still but 25 seconds behind him, and the sure-footed Isotta less than two minutes to the bad. Stricker and Florida were holding stubbornly to fourth and fifth places, still pursued in order by Salzman and Luttgen. Both of the Knox machines were putting up an excellent race for stock cars of medium power, each gaining a place higher up in this round. In this circuit the Hotchkiss fell by the wayside with a broken clutch, and the Acme went out with broken gears. Kilpatrick had covered the first lap in 22:09, and Patschke had scored 23:23 for the same circuit.

Keene was well sustaining his reputation as America's crack amateur by his driving of his vetern Mercedes. He had made his second lap in 22:54. He bettered this in the third round by putting up a circuit in 22:18. There were mighty few professionals in the race beating the Long Island fox-hunter.

Fourth Lap (93.84 Miles).—In the fourth round Haupt put up the whirlwind lap that landed the Great Chadwick "six" in the lead and set the wise ones to wondering for this and two succeeding laps whether after all a dark horse might not spring a surprise on the much-touted trio of favorites and furnish the new American champion. Haupt had claimed for himself 20:40 in practice. Despite going that was not the best, he cut loose for fair and covered the course in 21:10. Lytle also got a few more notches of speed out of the Isotta and showed 22:04. In fact, the entire sextette of leaders ran this round at marvellous speed, Stricker scoring 22:23; Luttgen, 22:23, and Salzman, 22:31. Down among the luckless tail-enders Keene's light shone even more brightly than that of the vaunted leaders with a round in 22:10. All this hurrying and scurrying happened while Robertson was laid up at his pit at the grandstand looking after his tires. He put a new one on the rear wheel and shaped two others to his car for emergencies. It cost him a delay of over three minutes. This was enough, however, to put him into fourth place, so close were Haupt, Lytle, and Stricker at his heels. All this time Strang was plodding along way back in the ruck under a hopeless handicap of close to 30 minutes, incurred by his delay at the start. A burnt out clutch finally put him out of his misery and the race in this lap. The relentless law of compensation had gotten in its fine work at last on the winner of four straight road races and laid him low.

Fifth Lap (117.30 Miles).—Haupt continued his impressive run with the Chadwick and again in the fifth round scored the fastest time, 21:36. Further down the line Florida and Stricker were also putting in great licks of speed with rounds of 21:38 and 21:40. Lytle had slowed down to 23:28, and even Robertson with three cars still ahead of him was doing no better than 22:23. Stricker got by Lytle and Robertson failed to improve his position. In fact, Stricker's gain of a place was the

cylinder Chadwick, Haupt at Wheel, Which Made a Most Creditable Showing Until Ignition Troubles Put It Out of the Running.

hange in the whole time. Haupt was now but 27 seconds of Stricker, who led Lytle by 37 seconds. It was a race ir. Robertson had gained on Lytle, but was losing to the 'ick and Mr. Graves's car.

h Lap (140.70 Miles).—Robertson now began to real- danger and drove like a speed demon indeed. Covering urse in 20:30, he swept by Lytle and at the end of the as in second place, but with a margin of 1 min. 13 sec. ting him from the flying Chadwick. Lytle had spurted to 22 minutes flat and Stricker had fallen over three 's behind the flying trio of leaders. This quartette was g a wide field on the pursuing field.

:nth Lap (164.22 Miles).—At 9:07 word came that had stopped near Bethpage and that Lytle had passed him. ; time the Chadwick was not only leading in actual time, ading the pocession as well. He had some trouble with a 'hain, but it was a balky magneto that was his undoing. iere on, though he continued in the race, he was no longer :. He had put up a brilliant performance and demonstrated e Chadwick is a car to be reckoned with in the future in any company. The race had now become a duel between Robertson and Lytle. With the falling back of Haupt, the Locomobile had once more assumed the leadership. Putting up another lap in 20:36 as against Lytle's 22:05, he led the game Isotta that needed nothing but a wee bit of more power and speed by 2:09 at the end of the seventh round. With Haupt out, Stricker again got in the leading trio with Mr. Graves's car.

Eighth Lap (187.08 Miles).—The contest had now narrowed down to a match race between the Locomobile and the Isotta, though Stricker was some five minutes behind with the Mercedes, his only chance lying in an accident or more than a normal tire repair or fuel filling stop. Calamity came to Salzman in this round. The Thomas had been running smoothly and well scoring its laps in from 22:31 to 24:13. At the end of the preceding lap, which it finished in fourth place, it was tied up in front of the grandstand with an ill-fitting rim. It took Salzman fully 20 minutes to right it and this delay caused him a drop from fourth to sixth place. In this round Robertson pulled away a bit from Lytle and led him 3 min. 29 sec.

Ninth Lap (211.44 Miles).—Robertson slowed down a trifle

ien Strang Finally Got His Renault Into Action, It Accomplished Some Remarkably Fast Laps Before Its Finish.

in this lap to a 22:22 gait, and Lytle kept the Isotta at its limit, scoring 21:48. The Italian car showed the same even pace it has displayed in all its races. Up to this point its fastest lap had been done in 21:33 and its slowest in 23:42, a variation of but 2 min. 9 sec., fuel replenishment stops included.

"I just drove the Isotta at its best all the way," said Lytle, "and that was all I could do. The car could go no faster and its fastest was not fast enough to beat the big Locomobile."

Tenth Lap (234.60 Miles).—Once more Robertson quickened the pace of the Locomobile and pulled away a bit further from the Isotta, their respective circuits footing up 20:55 and 22:10. It was in tbis round that Graves lost his grip on third place with Mr. Graves's Mercedes. Stricker stopped at the Locust Grove Station to look after a leak that had developed in his radiator. When he lifted the hood he saw that the fan had come loose and run amuck, ripping a hole in the radiator, and that he was out of the race. This let Mr. Vanderbilt's Mercedes into third place, while the Salzman Thomas moved up into fourth position, closely pursued by Florida in the Locomobile.

The Finish (258.06 Miles).—Entering the last lap Robertson began his run over the homestretch with a margin of 4 min. 10 sec. Lytle, however, it must be remembered, had started ten minutes before Robertson and so was first to start the last round. Though the Locomobile had the race well and safely in hand, barring accidents, there was always the possibility of a stop for one cause or another. Robertson had been on his last circut some ten minutes when the announcement was bellowed by Peter Prunty through the megaphone that the Locomobile was off the road near Locust Grove. The excitement had hitherto been great. It became a tumult now. It raged for two minutes and then came the message that the favorite was on the road again and on his way. A great cheer went up. It seems that a skid had sent a tire to the bad. It took him 2 min. 10 sec. to unlimber a fresh tire and make the replacement.

Then, Lytle finished his run. All those at the finish, whose eyes were not glued to their watches, gazed eagerly up the stretch. Seven minutes passed and no Robertson. Eight minutes came and with it the Locomobile over the top of the hill, half a mile away. In less than 30 seconds he had flashed by the stand.

"Time! Time! Time!" yelled the crowd. It came quickly for once: "240 minutes 48 1-5 seconds." Robertson had won by 1 min. 48 1-5 sec. Thousands cheered themselves hoarse at America's first international road race victory. Then came the rush of the crowd that caused the ending of the race.

FOURTH RACE FOR THE VANDERBILT CUP, October 24, 1908—DISTANCE, 258.06 MILES; CIRCUIT, 23.46 MILES.

No.	Car	H.P.	Driver	Mechanic	1	2	3	4	5	6	7	8	9	10	11	Total
16	LOCOMOBILE	120	Robertson.	Hethridge..	20:54	43:07	1:03:24	1:29:14	1:51:37	2:12:07	2:32:43	2:53:19	3:15:41	3:36:36	4:00:48½	4:00:48½
						22:13	20:17	25:50	22:23	21:30	20:36	20:26	22:22	20:55	24:12½	
6	ISOTTA	60	Lytle	Fehr	21:52	43:26	1:05:16	1:27:19	1:50:47	2:12:47	2:34:52	2:56:48	3:18:36	3:40:46	4:02:36½	4:02:36½
						21:34	21:50	22:03	23:28	22:00	22:05	21:56	21:52	22:10	21:50½	
1	LOCOMOBILE	120	Florida	Hall	23:10	45:23	1:07:36	1:33:34	1:55:22	2:23:39	2:45:15	3:11:14	3:47:23	4:09:07	4:28:10	*4:28:10
						22:13	22:13	26:08	21:38	28:17	21:36	25:59	36:09	21:44	21:03	
5	MERCEDES	120	Luttgen	Pfeiffer	23:32	49:16	1:12:10	1:34:34	1:56:50	2:19:15	2:46:42	3:08:49	3:36:14	4:03:30	4:30:35	‡4:30:35
						25:44	22:54	22:24	22:16	22:25	27:27	22:07	27:25	27:16	27:05	
12	THOMAS	115	Salzman	Clanchow	22:04	46:17	1:08:54	1:31:25	1:53:58	2:16:47	2:39:51	3:21:41	3:45:34	4:08:11	Running when race stopped.	
						24:13	22:37	22:31	22:33	22:49	22:56	41:50	23:53	22:37		
2	KNOX	40	Dennison	Crane	24:33	56:39	1:21:42	1:47:19	2:21:36	2:47:20	3:15:18	3:45:56	4:13:09	Running when race stopped.		
						32:06	25:03	25:37	34:17	25:44	27:58	30:38	27:13			
3	MERCEDES	120	Stricker	Conners	22:25	43:22	1:04:49	1:26:10	1:50:20	2:15:04	2:39:48	3:01:15	3:30:57	Caught fire and retired.		
						20:47	22:57	22:13	21:18	24:44	24:44	21:27	29:42			
20	KNOX	50	Bourque	Lynch	27:15	52:06	1:17:32	1:43:06	2:15:41	2:43:47	3:15:00	3:42:20	Running when race stopped.			
						24:51	25:26	25:24	32:35	28:06	31:13	27:20				
8	THOMAS	80	Seymour	Pepperday	31:43	1:03:43	1:35:05	2:12:56	2:40:29	3:09:16	3:35:23	4:03:01	Running when race stopped.			
						32:00	31:22	37:51	27:33	28:47	26:07	27:38				
4	CHADWICK	90	Haupt	Lindquist	21:53	43:22	1:04:49	1:26:10	1:47:46	2:11:54	3:08:00	4:04:15	Running when race stopped.			
						21:29	21:27	21:21	21:36	24:08	56:06	56:15				
18	MERCEDES	120	Keene	Ehrweiler	53:25	1:16:17	1:38:35	2:00:45	Caught fire.							
						23:52	22:18	22:10								
7	MATHESON	60	Ryall	Hook	26:13	1:05:59	1:37:45	Caught fire.								
						39:46	32:57									
17	RENAULT	115	Strang	Addison	59:49	1:22:47	1:46:45	Broke clutch.								
						22:58	23:58									
11	ACME	60	Patschke	Dearborn	23:23	48:06	Withdrawn.									
						24:43										
9	HOTCHKISS	120	Kilpatrick	Kiehn	22:43	1:08:13	Broke clutch.									
						45:30										
15	MATHESON	85	Chevrolet	Nelson	22:09	Cracked cylinder.										
19	THOMAS	115	Gill	Gilbert	26:45	Gear trouble.										
10	BRASIER	96	Pouget	Stone	Did not start.											
14	B. L. M.	85	Williams		Did not start.											

*Finished unofficially; time estimated, owing to accident near finish line; allowance, three minutes.
‡Unofficial time, race having been declared ended.

HOW THE LEAD SHIFTED DURING THE RACE

No.	Car	1st Lap	2d Lap	3d Lap	4th Lap	5th Lap	6th Lap	7th Lap	8th Lap	9th Lap	10th Lap	11th Lap
16	LOCOMOBILE	1	1	1	4	4	2	1	1	1	1	1
6	ISOTTA	2	3	3	2	3	3	2	2	2	2	2
1	LOCOMOBILE	8	5	5	6	6	7	5	5	6	5	3
5	MERCEDES	10	8	7	7	7	6	6	4	4	3	4
12	THOMAS	4	6	6	5	5	5	4	6	5	4	
3	MERCEDES	6	4	4	3	2	4	3	3	3		
2	KNOX	11	10	9	9	9	9	9	8	7		
20	KNOX	14	9	8	8	8	8	8	7			
8	THOMAS	15	11	10	11	10	10	10	9			
4	CHADWICK	3	2	2	1	1	1	7	10			
18	MERCEDES	16	14	12	10							
7	MATHESON	12	12	11								
17	RENAULT	17	15	13								
11	ACME	9	7									
9	HOTCHKISS	7	13									
15	MATHESON	5										
19	THOMAS	13										

FASTEST LAPS OF THE RACE

Car	Driver	Lap	Time	M.P.H.
LOCOMOBILE	Robertson	3d	20:17	69.4
LOCOMOBILE	Robertson	8th	20:26	68.9
LOCOMOBILE	Robertson	7th	20:36	68.4
LOCOMOBILE	Robertson	1st	20:54	67.3
LOCOMOBILE	Robertson	10th	20:55	67.2
MERCEDES	Stricker	2d	20:57	67.1
MERCEDES	Stricker	5th	21:18	66.1
CHADWICK	Haupt	4th	21:21	65.8
CHADWICK	Haupt	3d	21:27	65.6
MERCEDES	Stricker	8th	21:27	65.6

THE BATTLE FOR THE LEAD

Lap	Miles	First	Time	Second	Time	Third	Time
1	23.46	LOCO. No. 16.	20:54	ISOTTA	21:52	CHADWICK.	21:53
2	46.02	LOCO. No. 16.	43:07	CHADWICK.	43:22	ISOTTA	43:26
3	70.38	LOCO. No. 16.	63:24	CHADWICK.	64:49	ISOTTA	65:15
4	93.84	CHADWICK.	86:10	ISOTTA	87:19	MERC. No. 3.	88:42
5	117.30	CHADWICK.	107:46	MERC. No. 3.	110:20	ISOTTA	110:47
6	140.76	CHADWICK.	131:54	LOCO. No. 16.	132:07	ISOTTA	132:47
7	164.22	LOCO. No. 16.	152:43	ISOTTA	154:52	MERC. No. 3.	159:48
8	187.88	LOCO. No. 16.	173:19	ISOTTA	176:48	MERC. No. 3.	181:15
9	211.44	LOCO. No. 16.	195:41	ISOTTA	198:36	MERC. No. 3.	210:57
10	234.60	LOCO. No. 16.	216:36	ISOTTA	220:46	MERC. No. 5.	243:30
11	258.06	LOCO. No. 16.	240:48½	ISOTTA	242:36½	*LOCO. No. 1.	268:10

*Unofficial timing.

REGULARITY OF RUNNING

Car	Driver	Fastest	Slowest	Variation
ISOTTA	Lytle	21:34	23:28	1.54
MERCEDES	Luttgen	22:07	27:27	5.20
LOCOMOBILE	Robertson	20:17	25:50	5.23
KNOX	Bourque	24:51	31:13	6.22
MERCEDES	Stricker	20:57	29:42	8.45
KNOX	Dennison	24:33	34:17	9.44

AVERAGE SPEED OF LEADERS

Car	Driver	Miles	Time	M.P.H.
LOCOMOBILE	Robertson	258.06	4:00:48 1-5	64.3
ISOTTA	Lytle	258.06	4:02:36 2-5	63.8
LOCOMOBILE	Florida	258.06	4:28:10	57.14
MERCEDES	Luttgen	258.06	4:30:35	57.8

Viewed from a Technical Standpoint

E triumph of American automobile engineering and manufacturing is well evidenced by the fact that at the time the was officially called off, seven of the eleven American were running in good shape, whereas but two of the six gn machines were running. America had 63.6 of its cars ing; Europe had 33.3 of its racing creations still active e conflict. Of the eleven cars under American colors five ne designated old machines, their début in road racing g back to October, 1906, when they contested either in the ating or final Cup trials. Robertson's winning Locomobile, ell as the other driven by Florida, were built for the 1906 , but have been renovated since only to the extent of ing a selective type of gearset to take the place of the essive type that the Locomobile company was fitting in its ines a couple of years ago.

e two Thomas cars were the same seen two years ago, but d in appearance by the use of cylindrical transverse gasoanks in place of the type previously used in which the seat ncorporated with tank. There were other minor changes. ull's Matheson also was a two-year-old save in that not a mprovements had been added which were not of sufficient t to eradicate the characteristic lines it originally carried. ese five, three were running in good shape at the finish, one the winner and the other absolutely certain of third place ne officials succeeded in keeping the course clear and al- at least five cars to finish. The performance of these five s such as to warrant the inference that two years ago ca had solved to a large extent, in one or two factories st, the problem of building enduring racing cars even if t period our drivers were not the equal in experience of bred abroad.

six newly-constructed American machines gave a good t of themselves and four were running with the utmost ity at the finish, the Chadwick six, the two Knox es, and the Grand Prix Thomas being the quartette. At l of the sixth lap the Chadwick was leading the field by a of 13 seconds and running with great ease and regu- but lap seven was its Waterloo in which a couple of os went out of commission and necessitated running iles to the repair camp on three cylinders. In one mage distributor pin sheared off, the other short-circuited in nature. It took 56 minutes and 6 seconds to complete the l by that time its chance of winning was eliminated.

Grand Prix Thomas No. 8 driven by Seymour did not ast speed at any time, but evidenced regularity in the ips it completed.

ther two cars to keep in the running were the two Knox s, piloted respectively by Denison and Bourque; Denving finished nine laps and Bourque eight and reaching nd stand unofficially on the ninth. Bourque's machine ne distinction of being the lowest-powered racer on the , having a horsepower of 38 according to A. L. A. M. . In spite of this lack of power it negotiated laps in 24, 25, 37, 28, 31, and 32 minutes, a performance of commendable regularity. Denison's car is a higher-powered and faster machine and got a mark of 22:01 in the second lap, which proved to be its fastest. Both of these cars are alike in motor design, but differ in that the Denison machine is chain driven and Bourque's shaft. Both are characterized by motors having intake and exhaust valves carried side by side in the cylinder heads and with overhead rocker arm actuation.

It is regrettable that two of the new American cup contestants should have been forced to withdraw early in the race, the Acme six in the third lap and the Matheson in the second lap. The Acme started off on the first two rounds with a regularity that recalled its consistency at Savannah last Spring and critics started to look for a repetition of that performance. A long wait for the completion of lap three frosted the expectations and soon a special telephone message to the headquarters brought the information that one of the timing gears on the engine had broken and had incidentally wrecked the gear on the other camshaft. This necessitated immediate withdrawal. From a representative of the company it was learned that both of the camshaft gears are made of manganese bronze, a metal highly capable of withstanding the heaviest service, but it seems that the accident was simply one more case of racing luck—a misfortune which might have been avoided by a longer practice period. This car being the other six-cylinder contestant, much interest centered in its performance, and many were watching the working of the "sixes." But it shared misfortune with the Chadwick, though much more seriously, and the American public will have to wait for another performance before the "battle of the sixes" will be in more tangible form.

From a standpoint of tire wear, it is interesting to note that the Chadwick "six" in the eight laps it completed and in the unofficial ninth had not to make a single tire replacement, and a cursory examination of the tires as the car stood in front of the grand stand after the race was called off failed to discover any traces of extreme wear that would tend to indicate that a change would have been imperative before the end of the race had the machine been privileged to finish.

Immediately after the Cup race the officials of the Chadwick Engineering Works arranged for a public inspection of the car. For this purpose, the motor was dismantled in order that the dimensions and finish of the cylinders, as well as its other parts, could be examined. Through an unfortunate error it was stated in the table printed in the issue of THE AUTOMOBILE of October 22, that the motor was rated at 90 horsepower. By the A. L. A. M. official rating, its cylinder dimensions of 5-inch bore by 6-inch stroke show it to be but 60-horsepower, in view of which its performance during the four laps of the race prior to its delays through magneto trouble is all the more creditable. The makers state they will guarantee deliveries of duplicates of the Vanderbilt car, and will further guarantee them to be capable of the same endurance and speed.

The Chevrolet Matheson encountered hard luck on the second

Six-cylinder Acme Making a Spectacular Turn.

lap when the cracking of a cylinder worked its speedy elimination, although the car did not suffer any other troubles. This car is a four-cylinder machine in which are incorporated many of tbe principles of the 1909 cars which, it is said, will differ materially from the present machines. The car is a shaft-driven type and made a most favorable impression by its quick and easy getaway. This car uses a left side exhaust instead of the rigbt used on the old Matheson, and the value of such in a race is considerable in that there is much less danger of the smoke getting in the driver's face. In Ryall's Matheson the exhaust is taken out through the bonnet particularly high on the rigbt side and over the carbureter, and it was doubtless owing to this scheme that the car reached the grand stand on the last lap with flames sbooting from the mud apron. The initial trouble, and undoubted cause of the fire, came wben the driver hit a cement bridge too near tbe right side and at too high a pace, the result being a badly sprung rear axle at the right and the right rear wheel splayed at the bottom. This quick jerk, due to hitting the bridge, shot the gasoline upwards out of the carbureter, the vapor from which was quickly ignited because of the proximity of the hot exhaust pipes. To accentuate the danger was the fact that on this car the carbureter was slightly higher than ordinary, bringing it still closer to the exhaust. The fire had nothing to do, however, with the withdrawing of the car, as this was directly owing to a short-circuiting of the armature winding of the magneto.

Of the seventeen cars that started, thirteen were chain driven machines and four sbaft-driven, the latter class including Bourque's Knox, Strang's Renault, Chevrolet's Matheson, and the Hotchkiss. It is rather interesting to note that only one of tbese was running at the finish, the cause of their elimination, however, not being due to shaft drive. Of tbe chain-driven cars tbe Chadwick was the only one to make use of chain casings.

The five examples of low-tension make-and-break ignition were the two Locomobiles, and the three Mercedes cars and the Matheson. All otbers used jump spark with magnetos.

In motor design plenty of variation appeared. The Acme Knox and Grand Prix Tbomas serving as examples of individually cast cylinders, while practically all of tbe other cars had cylinders in twin castings. In the Locomobiles the intake valves are in tbe cylinder heads and operated by rocker arm, and in the two Vanderbilt Thomases the intakes are directly above the exhaust in valve chambers on the left side, and are opened tbrough rocker valve action. This is sufficient to show that the tendency is very strong in racing cars to locate one set of valves in the cylinder head and in some cases to put both sets in this position if room permits.

Replanishing at Grandstand, Car Baing the Iaotta.

The additional lubricating facilities for a racing car will always be an interesting factor, equally interesting as is the continuous pumping of oil to the crankcase by tbe mecbanics of many of the cars. The majority of them use large cylindrical oil tanks, some of which ahe carried between the gasoline tank in the seat, others on the dash—like the Hotchkiss, and one or two on tbe floor board in front of the seat, as used on one of the Mercedes. The large reciprocating oil pump in the footboard is with a majority of the racing cars an absolute necessity, and is an indication of the large quantities of oil necessary.

Many of the contestants showed inexperience by the small filling caps for the gasoline tanks as well as the oil tanks, and to these may be added the radiator caps. Undoubtedly the best example of large filling caps was Lytle's Isotta. When he stopped to take on supplies in front of the grand stand a funnel was handed of sufficient size, so that three 5-gallon gasoline cans could be dumped on end into it at once, while the mechanic held a fourth 5-gallon aloft and simultaneously emptied its contents into the funnel. By having each of the 5-gallon cans with specially large spouts, the work was done all the quicker. The oil arrangements for this car were such that it was but a matter of a few seconds to empty a 5-gallon can of oil into the oil tank. Robertson had mediumly good facilities, but lost time filling the radiator from a common garden hose at the starting of the second lap. Both of the Knox cars could have saved time by the use of long-leverage lifting jacks to raise the axle when making tire changes instead of using the common jack that the ordinary tourist carries in his kit.

Wheelbase Not, as Heretofore, a Factor.

The problem of wheelbase was not a determining factor in this year's race, as it was on the two occasions when the Darracq cars, piloted by Hemery and Wagner, carried off the trophy. Both of the Locombiles measured 110 inches from axle to axle, the Isotta is 118, and had the distinction of being the longest wheelbase machine in the contest. All three Mercedes measure 107 inches; Haupt's Chadwick, 112 inches; the Knoxes, 102 and 106 inches, respectively; and the Thomases, 104 and 112 inches. The banking of the turns is a factor which eliminates the wheelbase question to a considerable extent.

A commendable precaution in the form of a wire screen in front of the radiator was noticed on the Isotta and No. 3 Mercedes, the purport of these being to prevent injury to the radiator by stones thrown by other cars.

Because of the weight limit allowed in the contest, the wholesale drilling of frame parts and axles to reduce weigbt was not noticeable, except in one or two cases where particularly heavy cars had to reduce a good few hundred pounds. No. 4 Chadwick had the rear axle drilled throughout its entire length, but, in spite of this, had a good safety factor by reason of the original axle size. This car used a peculiar type of front semi-elliptic spring, in which tbe leaf wbich bolted to the spring hanger at the front end extended but half the length of the spring and bolted to a projection on the top of the spring shackle, giving an extra leaf in the front half of the spring, and one double in thickness for the remaining leaves. In conjunction with this sbock absorbers were used only in front. The majority of makers used shock absorbers in front and rear, and it was apparent that the Hartfords had by far the biggest following; the Renault car, however, being fitted with absorbers built at the home factory.

Mechanical Misfortunes of Some Contestants

AT the race is not always to the swift is quite as true of automobile racing as it is of other things, and nothing ht this out more strikingly than the mishaps which served ce some otherwise dangerous competitors *hors de combat* before things had settled down to a point where a winner be picked with anything like certainty. Contrary to precedent set by former occasions of the kind, when the great bulk contestants' misfortunes have been of a nature so trivial make them far more aggravating causes of defeat on that nt, all of the drivers' mishaps last Saturday were not small; petty in their origin, they led to things sufficiently serious ke it impossible to proceed.

bably in few events of classic importance that have been ince the automobile attained to a degree of development its design was no longer a matter of guesswork, has the g water proved such a prolific source of misfortune. Right Robertson, whose Locomobile lost two minutes on the first this account, down to Stricker and Keene of the Mercedes who were placed hopelessly out of the running at an early the range extended, and there were not a few others who the necessity of replenishing the radiator an imperative before they had gone very long. Well-meant efforts to against defeat from any cause whatever, coupled with a nervousness that was natural under the circumstances, was sible for this slight trouble on the part of Robertson's obile. The latter is equipped with a high-compression of large size, fitted with low-tension ignition and with no ession relief or other means for facilitating its starting. tle strength is required to turn it over, and for fear that those little things that cannot be guarded against on the gulated of motors might serve to delay his start and lose a crucial moment, Robertson ran the motor idle for quite ime before Florida in the No. 1 Locomobile was called to e. The result was that the motor ran pretty warm and it aporated no inconsiderable part of its normal allottment ing water by the time it got away. Robertson's time for t lap shows that fear of overheating did not delay him t many of the Locomobile supporters were in an agony ense, thinking that he might find it necessary to stop at some inaccessible place on the course to replenish the radiator. Fortunately, this did not happen, and the most serious result was the loss of a minute or two that had to be deducted from the following lap, due to the necessity of stopping at the stand to fill the radiator, but the manner in which the car was brought to its pit and the squirting hose made to deliver its output into the steaming radiator brought a cheer of admiration from the entire crowd. Quite in contrast with this, were the performances of those mechanics who leisurely removed the radiator cap and slowly poured the contents of a spout can into it.

But some of the drivers, whose misfortunes consisted of lack of sufficient cooling water, were not so fortunate. Seymour in the No. 8 Thomas Grand Prix car made no less than three stops at the Locust Grove repair station for the purpose of refilling the radiator, though like Robertson, his chief loss was in the time consumed. In the case of some of the others, it was a far more serious matter. In fact, two of the Mercedes entries, those handled by Foxhall Keene and Stricker, were retired on this account. When he returned to the stand on foot, in exactly the same manner as characterized his appearance during the second half of the 1906 Vanderbilt, and attired in the same clothes, Mr. Keene explained to Mr. Vanderbilt that a leaky radiator was the primary cause of his troubles, though he added that more real trouble had been condensed into an hour's running that he had ever been put to before in his entire automobiling experience. The gradual loss of the water caused the motor to overheat to a point where it was no longer safe to run it further, and everything on the motor was brought to such a high temperature that the oil-soaked ignition cables caught fire, effectively putting a quietus on the car's chances.

Stricker's case was even more serious. One of the fan blades came loose from its hub and, flying against the inner face of the honeycomb radiator, made several gashes in it, through which all the water escaped, so that when its condition was discovered, the motor could not be run until allowed to cool. The use of any water obtainable would have meant cracked cylinders, so that after the temperature had been lowered considerably by waiting, lubricating oil was resorted to in the attempt to locate the radiator leaks, but things were still so hot that the oil promptly caught

Hands Across the Sea—Locomobile and Mercedes.

But Robertson's Smile Is Happier Than That of Lytle.

fire, thus adding another to the list of competitors whose chances were ruined from this cause.

As a matter of fact, this most spectacular cause of a car's retirement was far more common than has ever been the case in any former event of the kind. In addition to the troubles of Keene's and Stricker's cars, which took place on the backstretch, the latter, near the Locust Grove repair station, Ryall's No. 7 Matheson suffered the same disaster, though from a different cause, and was driven several miles in a sheet of flame, until the grandstand was reached, where the fire was speedily put out. There it was learned that the fire originated from a gasoline leak. This mishap was further complicated by magneto trouble and ended Ryall's chances, although every effort was made to get the car in shape again.

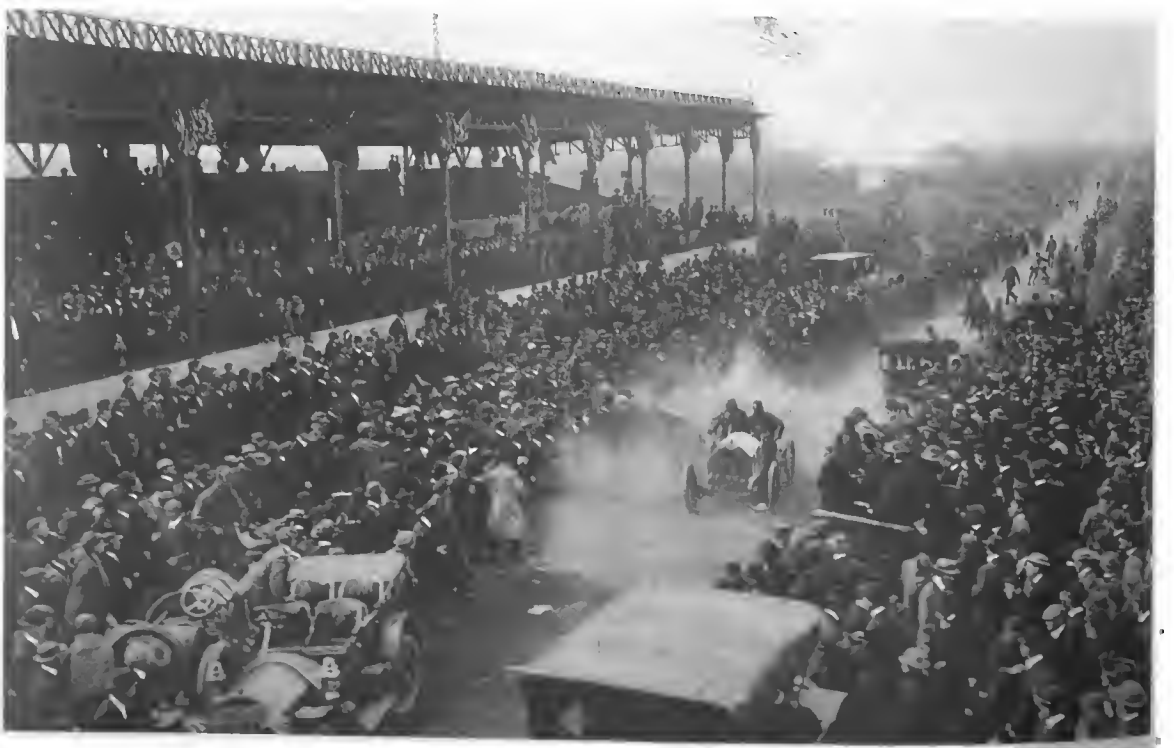
Just what had been responsible for the sudden and inexplicable elision of the Acme after having made two good laps, remained a mystery throughout the race. It had disappeared into its garage at Central Park and did not appear again after the second lap, but it was subsequently learned that the shearing of the pin holding the main timing gear on the crankshaft had put it hopelessly out of the running. Another of the long list of miscellaneous troubles that served to cut down the number of cars still running at the finish was the cracking of a cylinder on Chevrolet's Matheson, which was the first to be permanently retired. Doubtless the most disappointing case was that of the Brasier which broke its steering gear on the way to the start. Gill's Thomas provided the only case of gear trouble, while Salzman's No. 12 Thomas, which was third up to the seventh lap, had the misfortune to shear off four of the hub bolts holding the driving sprocket, replacing which cost fully 20 minutes and ended his fight for honors.

Of the things most to be dreaded by the racing driver, the petty troubles arising from ignition defections are probably feared more than any other, owing to the great loss of time they usually occasion to right them. They are generally trivial in themselves, but remedying them often means the waste of such an amount of precious time that ignition trouble is naturally the *bete noir* of every handler of the wheel.

It seemed particularly unfortunate that the Chadwick's highly creditable performance, which made Haupt a most likely winner right up to the end of the sixth lap, should have been spoiled on this account, as the consistency of the car's running and the great smoothness with which it maintained its lead were remarkable and formed the subject of universal comment at the stand. The tone of the big six-cylinder engine was scarcely a purr compared to the roar of the others, though it was reeling off the miles much faster than the majority of them, and the manner in which it was performing showed that a month's work could not have put a motor in more perfect running condition, as indeed its subsequent examination showed it to be, thus indicating that its defection was entirely due to the failure of the magneto. The Chadwick was the only car in the race that was equipped with two magnetos and independent wiring, but as ill-luck would have it, whatever was responsible for the defection of the one in use at the time, also appeared to affect the other, and even a third, which was taken as a replacement at the Locust Grove control, did not remedy matters entirely. Apart from this trouble, which caused Haupt to consume 50 minutes on the seventh lap, instead of his former average of about 21:25, the only stop was caused by a loose driving chain, which inspection showed did not require much attention and which ran the rest of the race as it was.

Strang's Renault was the first unfortunate to suffer from ignition trouble, due principally to the fact that the magneto fitted had only been put in place the night before, so that little or no time had been afforded in which to tune the car up with it on. Locating and remedying the trouble, which lay in the interruptor, cost Strang half an hour, and his chances were finally ended a few rounds later by the burning out of the clutch leather. Clutch troubles also ended the career of the big Hotchkiss early.

From an electrical point of view, the race was largely a battle of magnetos, as the contesting cars were fitted with the Bosch and Eisemann high tension magnetos in about the same proportions, the exceptions being the two Locomobiles, with their special low-tension magnetos, and the two Knox entries, which carried Splitdorf magnetos and a Connecticut four-unit dash coil and dry cells for starting.



Illustrates How the Crowd Swarmed on the Course After the Winning Locomobile Finished—Luttgen Is Worn

At the Repair Camps on the Turnpike

NOTWITHSTANDING the fact that the repair camp located at Locust Grove, about half way between Jericho and Woodbury, was fully equipped to meet almost any emergency in the nature of damage, and although each car had provided a separate stall manned by experts from the factories and supplied with every imaginable tool and extra part, there was but little call for any of these. The four racers to pass on the final round managed to dispense with the services of this available control entirely. The large crowd wbicb had congregated at this point was evidently of the opinion that there would be "something doing" in the line of record breaking repairs and replacements, and was only too eager to surround every car as it pulled up to its stand for gasoline, water, or oil.

The size and inquisitiveness of the crowd were a continual source of annoyance to the drivers who were forced to stop, when every second was precious, as was the case with two of the leading cars which met with minor accidents. There was small cause for wonder that several of the drivers became angry and made the air almost as blue with their vituperations as did the burning oil from the smoking motors.

Locust Grove is located near Syosset on the north side of the straight two-mile stretch of road between Collier's curve and Jackson's Corners, and as this is slightly down grade, it was along here that some of the greatest bursts of speed of the whole race were attained. The entrance to the repair stalls was about six inches deep in sand and dust, and one of the most spectacular features of the race was the sight of one of these powerful cars when it suddenly swerved off the main road and came ploughing through this soft road-bed, throwing the loose dirt in all directions. This served to attract the attention of the crowd to the unfortunate car, and by the time the tank cap could be unscrewed or the hood unstrapped, a mob twenty deep had surrounded the racer—there to remain until its attention could be attracted by the arrival at the control of another of the contestants. Of course many of the individuals endeavored to assist the drivers by handing them the necessary tools or parts, but in reality these little acts were more of a hindrance than a help, as it was one of the rules of the contest that the various supplies and accessories should be laid on the counter of the stall before which the car stopped and from there taken to the machine by either the driver or his mechanician.

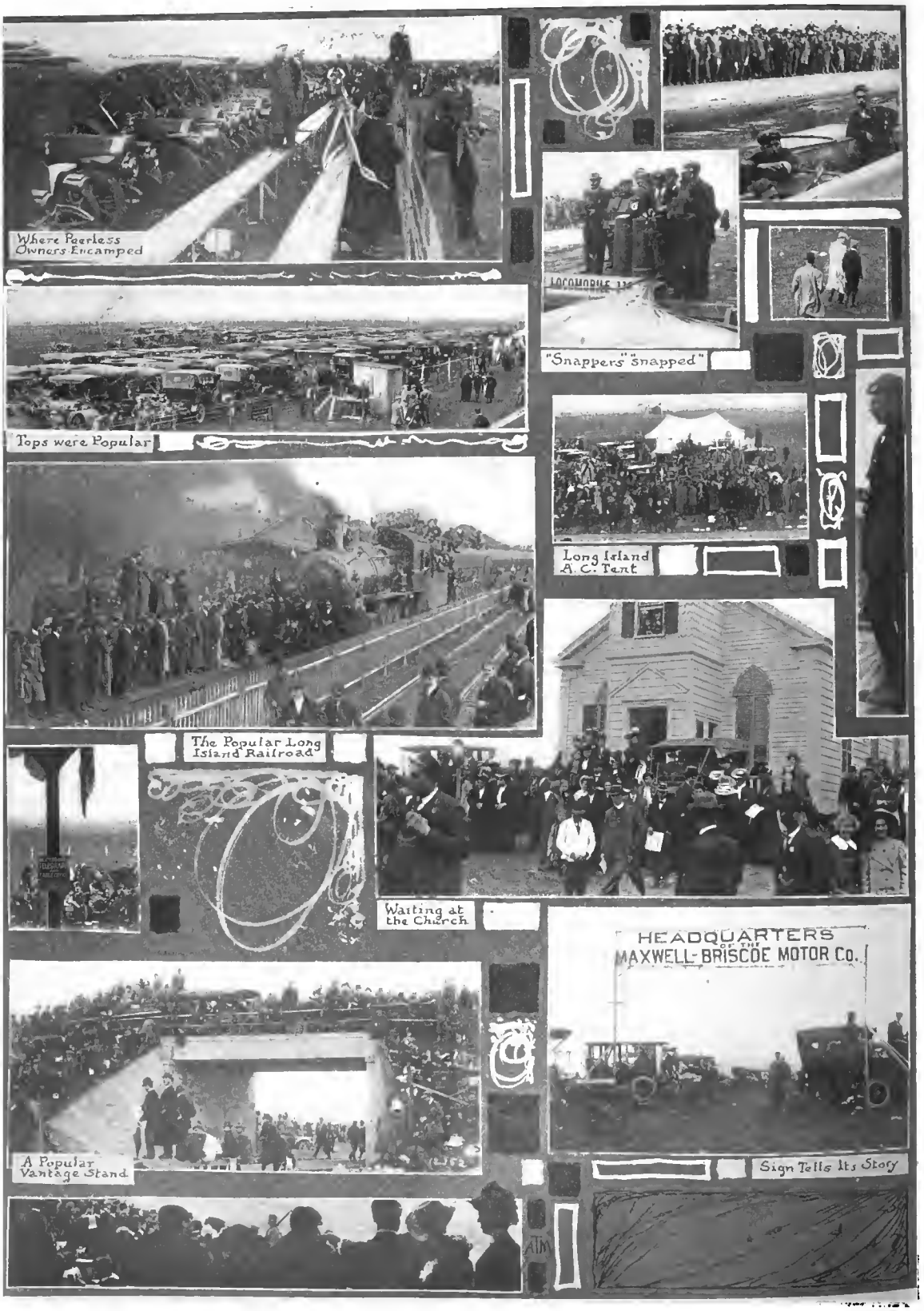
While there was a total of eleven stops made for repairs, replacements, or replenishments by six different cars, but two of these halts had any direct bearing on the result of the race. The first car to pull up at the enclosure was the No. 7 Matheson on its second round. This car had lost the top nut of the right-hand steering knuckle, and although the car could be operated, high speeding with the steering mechanism in tbis condition was dangerous. An extra nut was soon found among the bag of spare parts carried on the car, and after a few turns with a monkey wrench, the car was again on its way, having spent about six minutes in repairing the damage. In the meantime, however, the Knox car No. 20 had passed on its second round and the Locomobile No. 1, the Chadwick No. 4, the Mercedes No. 3, and the Isotta No. 6 had all whizzed by, each on its third round.

While this stop of six minutes did not put the Matheson No. 7 hopelessly out of the race, its halt again on the fifth round was probably indirectly the cause of its burning a few minutes later fartber down the course. The motor bad been running badly on this fifth round, and when the stop was made for the second time, it was found that one of the needle valves had been lost, thereby causing the carbureter to form an imperfect mixture. While this needle valve was being replaced, opportunity was taken to replenish the gasoline, water, and oil tanks. The gasoline was poured in from five-gallon cubical cans which had a part of the cover torn off. This did not form a very good spout, and the result was that a large part of each can was spilled over the entire rear part of the car, and it appeared to the spectators as though even the seat was saturated with gasoline. Many who saw this shower batb of gasoline believe that this method of filling the tank was the direct cause of the fire which soon after burst out from that part of the car. Be that as it may, this contestant was effectually retired from the race soon after, but the speed with which the two replacements in question bad been made was the cause of many expressions of admiration from tbe crowd.

On his first round, Joe Seymour, who was driving the Thomas No. 8, passed slowly and called out to ask where the supply station was located. Much to the surprise of everyone, he did not stop then, but during his six subsequent rounds he balted three times—once for a new front tire and water, and twice for more water. In the meantime, it was expected with each round that Louis Strang in his unfortunate Renault would stop for repairs, but he managed to ignore the backstretch repair station until his car was finally forced to withdraw from the race.

The two little Knox cars were the center of admiring groups when they each stopped for minor adjustments—notwithstanding the fact that the force of their side exhausts was almost sufficient to blow a man over. No. 2 stopped on the ninth round to strap on a new extra tire, while No. 20 stopped on the fifth round to fill the crankcase with fresh oil. This latter car also stopped on the seventh round for a few seconds to replace a spark plug. When No. 20 left the enclosure after its first stop, it started out neck-and-neck with the Matheson No. 7, and the crowd was treated to the sight of an exciting brush down the road. This private race did not last long, however, as it was but a few minutes later that the Matheson caught fire.

The high hopes of the Chadwick adherents for their car were blasted on the seventh round by magneto troubles which developed. This car had started the race in fourth position and at the end of the third round had climbed to first place. It held tbis position for three rounds and was looked upon as a probable winner on account of its consistent running and the high speed of which it proved itself capable, when this trouble with the ignition was encountered. The fault was found to lie in the magneto, but as two sets of ignition apparatus were carried, the


Where Peerless Owners Encamped
"Snappers" Snapped
Tops were Popular
Long Island A. C. Tent
The Popular Long Island Railroad
Waiting at the Church
HEADQUARTERS OF THE MAXWELL-BRISCOE MOTOR CO.
A Popular Vantage Stand
Sign Tells Its Story

uble was thought to be remedied easily. The second magneto, wever, also failed to work properly, and the car was forced make a stop at the repair station. Here an entirely new gneto was attached to the motor, wired up, and protected m the mud and oil by a rubber cover. At the same time that s was being done, the tanks were replenished with gasoline, er, and oil, and yet the entire delay did not occupy more than minutes. This stop, however, together with the delay on the d, destroyed all hopes of first place for the Chadwick, and eafter it was forced to content itself with seventh and eighth itions. This was one of the minor accidents which seriously cted the results of the race. This car stopped once again on ninth round for the purpose of tightening a loose chain, but on proceeded on its way again without taking the time to e the adjustment.

he one other car which had its position seriously affected by nnoying delay was Robert Graves' Mercedes No. 3, driven Emile Stricker. Although this was the same car which was y damaged in practice the preceeding week when it over- ed, its performance was one of the best of the morning, and racer had been holding second and third positions steadily en laps. Stricker had noticed that the motor had become what heated and he stopped at the repair station on his last or the purpose of refilling his water tank. The motor was d to be almost red-hot and the tank absolutely empty. On tigation, it was found that one of the fan blades had broken n its rapid revolution, had cut several holes in the honey- radiator, thus allowing all of the water to leak out. It was d that one of the cylinders might become cracked if cold were poured into this excessively hot circulating system, et a liquid of some kind was needed to determine the exact on of the leaks in the radiator. The danger of a cracked er was avoided by pouring thin oil instead of water into diator, but after a few minutes this produced an unexpected

When the oil came in contact with the hot cylinder walls, gradually vaporized and soon burst into flame which came the leaks in the circulating system. This set fire to the e, grease, and oil on the outside of the motor, and soon gine was a mass of flames. The fear of an explosion had ect of causing the crowd to scatter to a saft distance, and r and his mechanician were consequently given the elbow which they probably could not have obtained in any other The flames were soon extinguished with the aid of sand ew pieces of burlap in which some tires had been wrapped, may be supposed, this fire did not serve to cool the engine very much sooner, and these contestants were forced to sit idly by and watch the other cars pass on their way to the coveted finish line. Soon after the race was officially declared to be over, the unfortunate Mercedes had cooled sufficiently to allow the water tank to be filled, and it then joined the long line of homeward-bound spectators' cars and finished its eleventh lap at a much slower gait than had marked its progress for the ten preceeding rounds.

Although several of the racers suffered from tire trouble, but few of them had occasion to stop for accidents of this kind at the backstretch repair station. In fact, there were but two tire replacements made at this station, and one of these, that on the Mercedes No. 3, was not made until the car had practically been forced to retire from the race by reason of its hot motor. The other replacement was made on the extra Thomas entry, No. 8, but as Thomas honors were easily captured by No. 12, the tire trouble on the former car had no direct results on the effect of the race. The Knox No. 2 stopped once at the control for a new Fisk tire, but this was strapped on the rear with the other extra tires to be used in case of necessity and could scarcely be considered a tire replacement at the repair shop.

Many of the entrants displayed signals at this portion of the course in order that the drivers of their cars might be kept informed of their relative positions in the race. The Isotta No. 6, which ran a nip-and-tuck race with the winning Locomobile No. 16, had a large sign displayed at each round showing the difference in time between Lytle's and Robertson's running for that particular lap. Toward the last of the race, when it was a question of seconds as to which would prove the winner, the crowd was kept in a continual state of excitement by the figures on this board. These at no time showed Robertson to be more than three minutes in the lead, and when it was announced that he had encountered tire trouble on the last lap, after the Isotta had passed, much apprehension as to the outcome of the race was felt by his adherents. Robertson took every advantage of the straight course and down grade, however, and when he passed the control after having replaced his tires, it was apparent to everyone that his car was going much faster than any racer which had passed at any time during the contest.

While several of the cars were forced to retire on account of mechanical troubles, a remarkably large percentage of them were entirely free from difficulties and annoyances of this kind, and the preparations which had been made to cope with almost any kind of a breakdown were called into but little use, all of which speaks well for the constructors of the cars.

THE AUTOMOBILE CALENDAR

AMERICAN.

Shows and Meetings.

an. 7..—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reeves, General Manager, 29 West 42d St.

3.....—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. M. L. Downs, Secretary, 7 West 42d St., New York City.

....—Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. S. A. Miles, Manager, 7 East 42d St., New York.

.....—St. Louis, Mo., Annual Show St. Louis Dealers and Manufacturing Association.

.....—Boston, Mechanics' Building, Seventh Annual Automobile Show, Boston Automobile Dealers. Chester I. Campbell, Manager, 5 Park Square.

.....—Buffalo, Second Annual Power Boat and Sportsman's Show, Convention Hall, Dal H. Lewis, manager, 760 Main Street, Buffalo, N. Y.

Races, Hill-Climbs, Etc.

Oct. 31.....—Philadelphia, Sixth Annual Run of Automobile Club of Philadelphia for the Brazier Cup.

Nov. 3.....—New York City, Fort George Hill Climb, New York Automobile Trade Association.

Nov. 5-7.....—Detroit, Three-Day Endurance Run, Detroit Automobile Dealers' Association.

Nov. 25.....—Savannah, Ga., International Light Car Race, Savannah A. C. and Automobile Club of America.

Nov. 26.....—Savannah, Ga., Grand Prize Race, Savannah Automobile Club and Automobile Club of America.

FOREIGN.

Shows.

Nov. 13-21.....—London, Olympia, Seventh International Motor Exhibition.

Nov. 28-Dec. 13.—Paris, Eleventh Annual Salon de l'Automobile, Grand Palais, Automobile Club of France (Pleasure Vehicles, etc.)

Dec. 20-28.....—London, Stanley Show, Agricultural Hall.

Dec. 22-29.....—Paris, Eleventh Annual Salon de l'Automobile. (Commercial Vehicles, etc.)

Jan. 16-25.....—Brussels, Show Organized by Belgian Chamber Syndicate, Palais du Cinquantenaire.

THERE was less tire trouble in the 1908 race than in any previous contest for the Vanderbilt Cup. It was a great day for the vindication of tires, to which in years gone by many failures to make a good showing have been laid by drivers. To the perfection of the tire equipment can undoubtedly be laid in large measure the generally good performance of the majority of cars that started, and also the tremendous speed of the leading machines. The rain that fell during the night preceding the eventful day made it necessary to change all of the tires on all of the racers at the pits in front of the grand stand, steel studded non-skid tires being substituted for the lighter and faster plain rubber tread shoes, and a pair of extra studded tires and rims being strapped on behind.

This occasioned a delay of half an hour in starting the race. Drivers also asserted that the use of the non-skid tires and the extra caution in driving that would have to be exercised on account of the slippery condition of the course would slow the running time from two to four minutes for each lap. Yet much of this disadvantage was made up in the general freedom from burst tires and from tires pulling off the rims. After the race started there were not more than half a dozen stops to change tires at the grandstand and hardly more than that number on the other parts of the course. Stoppages during the race were made in the great majority of cases to take on water and gasoline or because of some mechanical trouble.

Michelins and Diamonds Predominated in the Race.

The winning Locomobile, driven by Robertson, and the Isotta, driven by Lytle, which won second place, were fitted with Michelin tires. William K. Vanderbilt, Jr.'s, Mercedes, driven by Luttgen, which finished fourth, although not officially timed, also had Michelins, while the other Locomobile, driven by Florida, which finished third, was fitted with Diamond grip tires and demountable rims. The two Knox cars, which were still running when the race was called off, were fitted with Fisk tires. Matheson No. 7, driven by Ryall, and the Acme car, were equipped with Diamond non-skid tires. All the other machines not already mentioned were equipped with Michelins.

Robertson stopped at the grandstand on his fourth round and changed his two rear tires as a precautionary measure, fearing that they may have become strained in his terrifically fast third lap made in 20:17. In his last lap he skidded off the road on the "S" turn at Plainview and tore off the left rear tire, which had to be replaced before the car could be driven onto the course again. Two minutes and 10 seconds were lost at this point, cutting down his lead over Lytle in the Isotta from more than four minutes to less than two.

The remarkable showing made by the Isotta with its 60 horsepower as compared with the higher powered cars is to be attributed partly to the fact that it did not stop once for tire changes, so that its performance was very regular, the greatest variation in its eleven rounds being only 1 min. 54 sec. Mr. Vanderbilt's Mercedes changed one rear tire that blew out just in front of the grandstand. The Graves' Mercedes blew out a front tire that had to be replaced, and on the eleventh lap a stop was made on the back stretch to replace a front right tire. The Chadwick, which was leading throughout the first six laps, was reported to have stopped in the backstretch to adjust tires, but it was delayed principally by ignition troubles during that and the subsequent lap, which it completed before the race was officially declared off.

Florida, in Locomobile No. 1, which finished fourth, changed a right front tire at the grandstand at the end of the third round.

Both of the Knox cars, which were still running well when the race ended, stopped for tire changes. The 50-horsepower machine driven by Denison changed one front and one rear tire on account of wear to insure against a blowout, and the 40-horsepower Knox, driven by Bourque, made a change of the two rear tires at the end of the seventh lap, from the studded non-skids to plain tires, after the roads had partially dried, in order to make a gain in speed. It also had some trouble with one of the front tires. At the Locust Grove repair station it stopped for water and also strapped a fresh tire on the rear deck, but made no change there.

Seymour, in Thomas No. 8, stopped at the repair station at Locust Grove on the backstretch to take on water and to put a new tire on the left rear wheel, although to all appearances the tire seemed to be all right. Possibly it was worn and weakened.

The race was a gruelling test of tires throughout from the word "Go!" The instant the clutch was let in at the starting line in the gray dawn, streams of sparks flew from the wheels, due to the friction of the steel studs in the cement surface of the Parkway as the wheels spun around on the wet and muddy surface, unable instantly to overcome the inertia of the heavy cars. With nine miles of cement surface to grind over in each lap, the wear was severe, and on the narrow winding roads on the northeastern corner the stresses due to taking the turns at almost mile-a-minute speeds were tremendous. That mere rubber, cotton fabric, and leather treads could stand up at all under it is marvelous. Each car had two spare non-skid tires on demountable rims strapped on at the back, but only a few had occasion to make any use of them. It is probable that the notable lack of tire trouble was in some measure due to the rain and the use of the steel-studded leather tread shoes, which were better able to stand the grinding and strain than plain rubber tread tires would have been.

Tire Troubles Were a Minimum Race Factor.

Huge wheeled jacks of the kind used in the Grand Prix race in France were employed for making tire changes. They were wheeled under the axle until the upright yokes engaged the axles at an angle, then two men threw their combined weight on the long double handle and the tremendous leverage forced the wheels of the jack beyond the center of gravity underneath, lifting both wheels clear of the ground in one movement. Removable rims were used universally, so that not more than two minutes were required for any change of tires after the race started. No trouble with the rims and their fastenings was reported or appeared evident. In fact, in this race, for the first time in this classic event, tire troubles took a very subordinate place to troubles of another nature.

(Vanderbilt Cup Story Continued on Page 625)

WHAT IS THE BEST MOTOR TIMING?*

By LOUIS LACOIN.

IG conversant with the various questions of timing and e necessity therefor, we may now examine the diverse ıs which different designers have arrived at. In a table, e grouped together the timing of a number of well-known , the order of arrangement being that of the increasing

The slowest, the *Ours*, makes 1,000 r.p.m. normally, he fastest, the *Sizaire et Naudin*, turns at the rate of p.m. These speeds are given in the last column of the The first four columns of the same table represent the lag

ınce in the timing of the ıt essentials of a num- motors, counting in de- from each dead center. ustration, Fig. 1, shows . degree is, the circum- of a circle having been into 360 degrees, also e degrees of lag and ad- as shown by the table, ·en calculated.

of the concentric cir- devoted to the timing of the motors, the smallest that of the slowest mo- ɔ, 1, while the largest is the Larrad (see note), as in the table, at the ɔr want of a better loca- s its inventor considers ications the best for all speeds. In short, the tion represents two ɔf the crankshaft, and in to distinguish any par- timing, the point repre- the lag given the open- the inlet valve should ı, this being found close ıpper dead center; then to the right around the ıtil the lower dead cen- ·ached, after which will ıd the lag given the ɔf the inlet valve. Con- the next point is that ignition advance, after le upper dead center is ssed. Toward the end ıird half turn, the lead exhaust valve will be nd after the last half closing of the ex- The regulation of each otors in question may In this manner in turn. ır to permit of an un- ng of the whole, we each one of the dif- ning arrangements in in which they appear on the illustration (Fig. 1). This procedure may appear to be the least logical, but it has the great advantage of progressing from the simple to the complicated. The lead given the exhaust, with which we will commence, is, in fact, the best known point in the timing of a motor, while the closing of the exhaust and the opening of the intake, times which frequently overlap, have values, which, according to different designers, vary by considerable margins.

The faster a motor turns, all other things being equal, the greater the amount of advance it is necessary to give the opening of its exhaust valve. It is a self-evident truth that if the speed of a motor be doubled, it travels twice as many degrees in the time necessary to lower the pressure. When considering different motors, as in this case, it is curious to note whether the same law has been observed, and the question may be put in terms of comparison for each one of the essentials of timing. It is this that has led us to adopt the classification of the motors by increasing speeds. So far as the exhaust is particularly concerned,

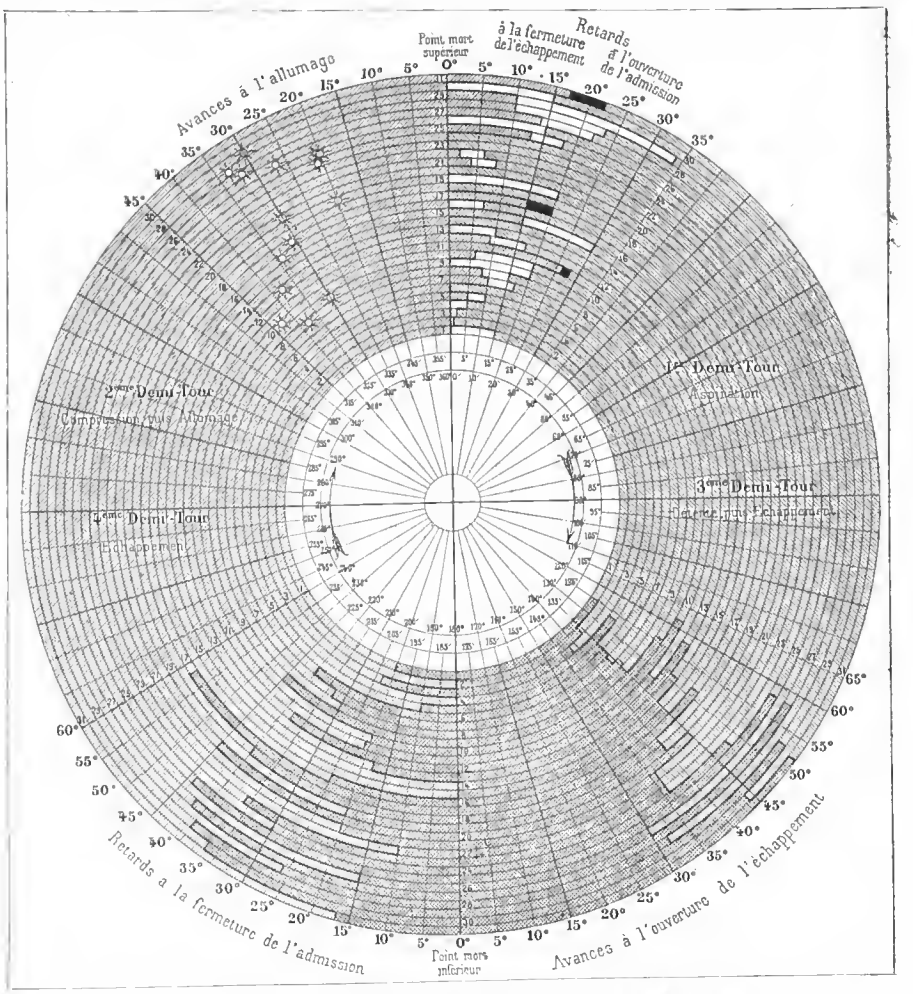


Fig. 1.—Diagrammatic Representation of the Timing of 30 Motors.

Translation—Avances a l'allumage = Advance of ignition.
Point mort superieur = Upper dead center.
Retards—a la fermeture de l'eschappement = Lag of exhauet valve closing.
a l'ouverture de l'admiesion = Lag of inlet valve opening.
Avancee a l'ouverture de l'echappement = Lead of exhaust valve opening.
Point mort inferieur = lower dead center.
Retards a la fermeture de l'admission = lag of inlet valve closing.

read before the Society of Automobile Engineers at its Meeting, September 18-19, 1908. Translated from the "Omnia," by Charles B. Hayward.
he occasion for the present article was the appearance of nown as the Larrad for indicating proper timing.
he numbers following the names of the motors refer to erical classification in the table, page 606.

a strange fact is to be noted in that the slowest motor, *Ours* (1), has 55 degrees of advance, while the fastest, the *Sizaire et Naudin* (30), has but 44 degrees. The greatest advance, 62 degrees, is in the *Mutel* (11), which makes 1,300 r.p.m., and the least 30 degrees, is that of the *Vinot Deguingand*, which makes 1,500 r.p.m.

It is impossible to lay down an absolute law, but, generally speaking, it seems that the slowest motors shown in the table are those having the maximum lead. Whence this anomaly? Simply because it is essential in designing a fast motor, to allow large openings for the valves and large piping, and these may compensate for the diminution in the lead given the opening of the exhaust valve. It must be recognized, on the other hand, that the more the expansion is prolonged, the less advance is there possible, and the less noisily will the gases effect their escape. The Renault motors (28) perhaps owe to this fact their very silent running, as they have a lead of but 32 degrees. But it is well, before going further, to distinguish between the moment of opening and the manner in which it is done. We have here the sole data of the moment of opening, but the latter may be accomplished brusquely, somewhat like the pop of a champagne cork, or progressively, as where the same bottle is opened by slowly letting the gas escape round the cork. The second plan is less harsh, but slower than the former.

This comparison explains how we can have, side by side, and for identical motor speeds, the *Aries* (25), with a lead of 58 degrees given the opening of the exhaust, and the *Vinot Deguingand* (26), with but 30 degrees. The profile of their cams must be different. The dimensions of their valves may also differ, which is the reason why the advance of 52 degrees, fixed by the Larrad as the best for all motors, strikes us as somewhat exaggerated. However, this figure is not very far from the mean shown by 30 motors which we have examined, this mean being equal to 46 degrees, 20 minutes. A motor regulated according to the Larrad would generally have to increase the lead given the exhaust, which in itself facilitates an increase in the speed.

Lag Given the Inlet Valve.

The second column of the table gives the points chosen by various designers for the closing of the inlet valve. Some of them have adopted the dead center, but we have already given the reasons which cause us to hold a contrary opinion; one that is held by the majority of designers to-day. The *Motobloc* (5) and the *Farcot* (22) give but 10 degrees of lag, while the *Vinot Deguingand* (26) makes it 15 degrees, and a great number have hit upon close to 20 degrees as the proper amount, these being the *Peugeot* (Paris) (13), 18 degrees; *Ours* (1), *Cornilleau Sainte Beuve* (10), *Rochet Schneider* (19), *Eudel* (21), all four of which have 20 degrees exactly; *Mutel* (11), 21 degrees; *Rossel* (3), 23 degrees; *Brasier* (16), 25 degrees; *Renault* (28), 26 degrees. But those having a much greater degree of lag are also frequent, the *Hotchkiss* (7) having 33 degrees; *Berliet* (12), 38 degrees; *Panhard* (6), 40 degrees; *De Dion Bouton* (20), 45 degrees. The palm, however, if our information be correct, must be awarded the *Peugeot* (Beaulieu) (17), with a lag amounting to 58 degrees.

It is interesting to know how much reduction there is in the cylinder volume corresponding to such a great amount of lag in the closing of the inlet valve, and the sixth column of the table gives, for all the motors, the relation of the length of the connecting rod to the radius of the crank. This relation once known, permits of the drawing of a diagram indicating the position of the piston at each angle of the crank. The same result may, however, be arrived at through calculations. Thus we find that the 40-degree lag of the *Panhard* (6) corresponds to a displacement of the piston amounting to 18.7 per cent. of its stroke; the 45-degree lag of the *De Dion Bouton* (20) represents 23.9 per cent., while the 58 degrees given the inlet of the *Peugeot* amounts to 38.4 per cent. of its stroke. Thus the cylindrical volume of the *Panhard* cannot be utilized to a greater extent than 81.3 per cent., that of the *De Dion* 76.1, and the *Peugeot* but 61.6 per cent. In view of these figures, is it any wonder that one should be skeptical as to the ability of the theorist to give the power of a motor merely by inspecting its bore, and without even taking into consideration its stroke?

The motors that we have already cited would have with an equal bore, less power but a higher efficiency, were the inlet valve to be closed sooner. The *Larrad*, which allows but 17 degrees of lag, recommends a timing that would provide a probable increase in power but to the certain detriment of the fuel consumption. On the other hand, this change of regulation would not be unattended by further inconveniences. The capacity of the dead space, in the motors in question, has been calculated with relation to the useful cylinder volume; that is, taking the quantity of mixture that can be imprisoned in the latter. By closing the inlet valve sooner, will it be possible to shut in a greater volume of gas? This increased volume must, nevertheless, be compressed in the same dead space and its pressure

TIMING REGULATIONS OF PROMINENT FRENCH MOTORS.

Nos.		Lead of Exhaust Opening.	Lag of Inlet Closing.	Ignit. Advance.	Lag of Exh. closing.	Lag of Inlet opening.	Relation of conn. rod to radius crank.	R.p.m at full power
1	OURS	55°	20°	var.	0°	15°	4.76	1 000
2	CHARRON.—20/30 h.p., 1908	44°	0°	—	0°	1°	4.55	1 100
3	ROSSEL.—40 h.p., 4 cylinders	38°	23°	—	0°	2°	4.29	1 100
4	GREGOIRE.—10/14 h.p., 4 cylinders, 1908	53°	0°	—	0°	5°	4.18	1 200
5	MOTOBLOC.—24h.p., 100/120 oR	45°	10°	—	5°	10°	4.75	1 200
6	PANHARD-LEVASSOR	45°	40°	—	0°	0°	4.5	1 200
7	HOTCHKISS.—4 cylinders 95/100	44°	33°	—	10°	17°	4.27	1 300
8	COTTIN-DESGOUTTES.—18/22hp	46°	30°	38°	8°	15°	4.15	1 300
9	BROUHOT.—12h.p., 4 cylinders, 75/110	45°	45°	30°	0°	20°	5	1 300
10	CORNILLEAU-STE-BEUVE.—20/30 h.p., 1908	56°	20°	43°	6°	20°	4.62	1 300
11	MUTEL.—40 h.p., 1908	62°	21°	var.	28°	26°	4.4	1 300
12	BERLIET.—22 h.p., 1908	48°	38°	—	9°	17°	4.5	1 300
13	PEUGEOT (*Paris*).—18/24 h.p. 1908	58°	18°	38°	0°	10°	4.76	1 300
14	LAZOS.—20/30h.p.	51°20′	0°	var.	0°	0°	4.18	
15	LUC COURT	45°	0°	—	15°	30°	4.25	
16	BRASIER	45°	25°	34°	0°	7°	4.5	1 350
17	PEUGEOT (*Beaulieu*)	51°30′	58°	31°	20°	15°	4.78	1 400
18	ASTER.—9h.p., 105/120	40°	40°	var.	0°	0°	4.3	1 400
19	ROCHET-SCHNEIDER. — 24h.p., 100/120	40°	20°	20°	0°	20°	4.75	1 400
20	DE DION-BOUTON.— 12h.p. 4 cylinders, 1908	45°	45°	30°	0°	0°	4.7	1 400
21	EUDELIN	36°	20°	var.	4°	8°	4.3	1 450
22	FARCOT.—14h.p., 80/100	36°	10°	—	4°	6°	4	1 500
23	CHENARO-WALCKER	36°	36°	—	0°	0°	5.25	1 500
24	DARRACQ.—10/12h.p., 100/120	48°	30°	21°	0°	0°	4.5	1 500
25	ARIES.—14/18h.p.	58°	44°	20°	13°	18°	4.91	1 500
26	VINOT-DEGUINGAND.—12/16h.p. 80/110	30°	15°	27°	0°	15°	4.54	1 500
27	SULTAN.—9/12h.p., 4 cylinders, 75/110	58°	42°	32°	10°	22°	4.55	1 600
28	RENAULT.—8h.p., 2 cylinders	32°	26°	33°30′	10°	23°30′	4.33	1 600
27	UNIC.—20h.p., 75/110	53°	40°	30°	10°	34°	4.5	1 650
30	SIZAIRE ET NAUDIN.— 15 h.p., 120/110	44°	37°	var.	0°	15°	5.25	1 100
31	LARRAD DEVICE	52°	17°	—	22°	17°	....	....

The motors are arranged in this table in the order of their increasing speeds. The angles are figured in degrees, counting from the nearest dead center. "Var." means that the point of ignition may be advanced or retarded by the driver.

will exceed safe limits, so that after several months' running the inevitable carbon deposits that occur will give rise to auto ignition and the motor will knock. It would then be the wisest course to decrease the amount of lag given the closing of the inlet valve by the designer. But the advantages of the *Larrad*, on the other hand, are, in our humble opinion, well justified in the case of such motors as the *Labor* (14) and the *Luc Court* (15), in both of which the inlet valve is closed at the dead center. The compression of such motors must, in fact, have been calculated on the basis of their total cylinder volume, since when running slowly the cylinder would be almost full, while at an accelerated speed the degree of compression would diminish considerably, since the charge drawn in would not fill it to the same extent. But in giving 17 degrees of lag to the inlet, as recommended by the *Larrad*, the motor couple would be improved, and in consequence its power, so that its speed would be increased, and the motor would be capable of high speed, since the exhaust regulation recommended by the *Larrad* calls for a very early opening.

Concerning the Ignition Advance.

The third column of the table contains, more than anything else, the word "variable." Fourteen designers, however, have given their motors a fixed point of ignition, but this point is

being the same with all of them. Located 43 degrees
e of the dead center in the case of the *Cornilleau Sainte*
is but 20 degrees away from that point in the *Rochet-*
(19) and the *Aries* (25), so that the ignition advance
aid to vary more than 100 per cent. Here, again, we
lves confronted with an anomaly similar to that which
ointed out in the case of the exhaust lead. In a given
e more its speed is increased, the greater necessity
its for advancing the point of ignition. But the *Cor-*
otor, with 43 degrees of advance, turns at the rate of
r.p.m., while the *Aries,* with only 20 degrees, has a
1,500 r.p.m. The sparking point in the case of the
tor is probably located more centrally, and it may be
ble that the much faster rate of ignition comes from
y reduced dimensions of the motor itself. The mean
f the fixed ignition points represented in the table is
31 degrees, 15 minutes.

Exhaust Closing and Inlet Opening.

ve now arrived at the most delicate point of our an-
it concerning the closing of the exhaust valve and the
f the inlet. Theoretically, these two points should suc-
another, the exhaust closing at the upper dead center
nlet opening immediately afterward. We have already
reasons why we consider it advantageous to close the
alve but a few degrees beyond the dead center, and
also shown why the inlet can, without inconvenience,
an instant later. We have shown that the piston can-
the exhaust gases out of the cylinder except by com-
hem to a degree in excess of that existing in the ex-
ve port and manifold. This excess of pressure may
eeble, but it is indispensable. At the end of the pis-
ke, or upper dead center, this compression still exists,
how little it may be, so that if the exhaust valve be
d the inlet be opened at that instant, this pressure will
he entrance of the fresh gas; worse than that, the ex-
es will penetrate into the inlet manifold. The move-
this direction is not accentuated, because the piston
egins to aspirate, but it is none the less evil on that

r, such designers as the *Panhard* (6), *Aster* (18), *De*
, *Chenard Walcker* (23), and the *Darracq* (24) follow
which we condemn. On the contrary, such as the
, *Rossel* (3), *Gregoire* (4), *Brouhot* (9), *Peugeot*
13), *Brasier* (16), *Rochet-Schneider* (19), *Vinot De-*
(26) and *Sizaire et Naudin* (30), all close the exhaust
er dead center, the inlet opening with a lag ranging
degree in the case of the *Charron* (2) up to 20 de-
e *Brouhot* (9). But despite the imposing number of
dictors, we are still of the same opinion. It is upheld,
ewhat timidly, by the *Farcot* (22), for example, with
grees of lag respectively, and in a much more positive
the *Sultan* (27), with 14 and 22 degrees; by the
8), with 10 and 23 degrees, and, above all, by the
with 10 and 34 degrees. The *Mutel* (11) also opens
ve very late, giving it 26 degrees of lag, but it closes
valve even later, with 28 degrees past the dead center.
se two degrees, both of its valves are open at the
This is a curious method of regulation, but it is
ended by Larrad, who is of the opinion that the
open 17 degrees beyond the dead center, while the
uld not close until 22 degrees have been traversed,
later. This brings up three questions:
at point is it most advantageous to close the exhaust?
at point should the inlet be opened?
vantageous to close the exhaust before or after the

Point of Exhaust Valve Closing.

known that the closing of the exhaust valve should
piston has passed the upper dead center, but the
g given it should not be as great as that given the
closing of the inlet valve. Assuming that the excess pressure of the exhaust equals the depression during aspiration, the time necessary to complete the emptying of the cylinder will be proportional to the volume of gas contained in it. At the end of the admission the volume of gas contained in the cylinder is equal to the cylindrical volume, plus the dead space. Suppose that, for example, to be one litre, for a motor of which the cylindrical volume is ¾-litre, while the clearance has a capacity of ¼-litre. At the end of the exhaust stroke, the piston being at the upper end of its course, the volume of gas is only that of the dead space, or ¼ of what it was and it is accordingly natural to suppose that this excess of burned gas will escape four times faster than the fresh gas will begin to make its way into the cylinder. On the other hand, as the angles described by the crank are proportional to the time, it may be said that 20 degrees of lag given the opening of the inlet, to take a mean figure, should correspond approximately with 5 degrees of lag to the exhaust. In a previous article in *Omnia,* to which reference has already been made, the angles were 16 and 4 degrees. Those of the *Eudelin* (21), are 20 and 4; *Berliet* (12), 38 and 9, and the *Unic* (29), 40 and 10 degrees.

It is evident that no absolute rule can be given here as the losses of the charge in the exhaust manifold are not necessarily equal to those of the inlet. When the muffler is at all choked up, the back pressure may be very high and this consideration has led Larrad to recommend 22 degrees lag in the closing of the exhaust, and 17 degrees for the inlet. This is probably exaggerated, the *Renault* (28), giving 10 degrees to the exhaust and 26 to the inlet, while the *Motobloc* allows but 5 degrees to the former and 10 to the latter. These designers give the exhaust a lag falling between ½ and ⅛ that which they allow the inlet. That is, the lag in each case is proportionately greater than those mentioned, without, however, going as far as Larrad recommends.

It would seem to result from the above analysis that the proper amount of lag to give the exhaust lies between 5 and 10 degrees, and we incline toward the latter figure. Ten degrees represent an appreciable angle and the time required for the crank to turn through it is not negligible, and an important quantity of exhaust gas may escape, but the piston is still very close to the dead center after the crank has traversed it. With a stroke of 100 mm. (3.93 inches), the piston has traveled hut 1.5 mm., assuming that all the joints are free from play, but if the big end of the connecting rod has a little, to which must be added that of the upper end, there will be .2, .3 or even .5 mm. to subtract from that length, so that the piston will still be practically at the dead center when the exhaust closes.

(To be continued.)

NEW BOOKS FOR AUTOMOBILISTS.

"My Auto Book," by Walter Pulitzer, just from the press of the Outing Publishing Company, New York, is the most recent addition to the numerous collection of automobile touring memos, if such they can be dubbed, that has appeared in the past year or two. But it has the distinction of not only leaving out a great deal that might better have been omitted from many of its predecessors, but contains considerable in the shape of a running fire of comment, opposite each blank page, for the history of a trip, that will make it worth while, even if the memo pages are never soiled. The "comment" consists of jokes with a gasoline flavor; some of them good, and all of them appropriately illustrated. The author wisely refrains from telling the purchaser of the book how to run his car, and for that much at least, he should be thankful.

"Fly," a New Magazine of Aeronautics.—From the press of Lawson & Kelley, publishers, Betz building, Philadelphia, the initial number of *Fly,* a monthly magazine devoted to matters aeronautical, has made its appearance. Alfred W. Lawson, who is well known as an able writer and author, is the editor.

THE UTILITY OF AUTOMOBILE CLUTCHES

By THOS. J. FAY, E. E., President Society of Automobile Engineers

CONE clutches are not of the class in which a pound pressure of the spring means a pound pressure on the clutch face. The cone serves to multiply the pressure of the spring. In other words, there is a lever advantage in using the cone. Charles H. Schabinger, in the *Horseless Age* of October 2, 1907, set forth a formula, as follows:

$$H.P. = \frac{P\,f\,r\,R}{63{,}000\ \sin\Phi};\ \text{in which}$$

P = the assumed pressure of the spring;
f = the coefficient of friction;
r = mean radius of the cone, in inches;
R = angular velocity, in revolutions per minute;
$\sin\Phi$ = sine of the angle of the clutch.

The formula transposed is as follows:

$$P = \frac{H.P. \times 63{,}000\ \sin\Phi}{f\ r\ R}$$

In this way the spring pressure may be approximated. It is important, however, to use a coefficient of friction such as wil' serve under practical conditions (Mr. Chabinger adapted the coefficient 0.25) which, in the author's judgment, will not hold in practice for any length of time, if leather is the facing used. If cork inserts are adopted, the coefficient would be a safe one to use, and it might be even higher. The coefficients for cork are given. If the facing is of leather alone, it would be wise to adopt the coefficient 0.15, as before given for an oily condition.

If 40 pounds are all that one would care to hold on the pedal, then it is plain that the value of P should be limited on that account. The ratio would then be 5:1, which ratio can be taken care of in a lever system. On this basis the dimensions of a 50 horsepower clutch, 1,000 r.p.m. would be about as follows:

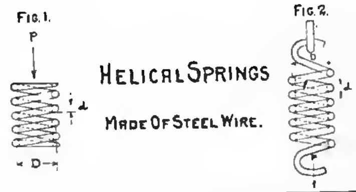
$$P = \frac{50 \times 63{,}000 \times 0.15}{0.15 \times 9 \times 1{,}000} = 350 = \text{pounds pressure of the spring.}$$

This is for an angle of about 9 degrees and, as will be observed, the spring pressure is somewhat higher than was the wont. This merely indicates the near approach of the limit of the cone type of clutch. The value taken for r is high enough to engender spinning, which is not to be desired, and the value of R is quite as high as it ought to be in a 50 horsepower motor.

Even so, it is a matter to be ascertained, if the ability of the clutch in terms of negative torque, will be adequate for a lasting clutch of the requisite maximum holding power. The constant 63,000 would have to be adjusted to suit the conditions, were it proven that the ability of the clutch in terms of negative torque falls below the desired value, which was set at double the positive torque, *i.e.*, the mean effective torque of the motor.

The question of the spring is one to be looked after with some care, and of it there is oftentimes some reason for believing the right proportions are not arrived at. The table of helical springs here given is one that will help out vastly if it is consulted. For this class of service the maximum carrying capacity in pounds can be taken. The table explains itself adequately. The range of the table is so great that it will handle all the problems of the clutch spring and if more or less than ten turns are desired, it will be possible to figure out the resultant ability with more or less than the ten turns taken in the table. The table was compiled by Max Hesse, while assistant to the author in connection with the Simplex Cars.

Neglecting the question of slipping from the utility point of view, we can take up the matter of the multiple disc type of clutch, with the idea of showing how it can be made to hold with greater certainty than would be the case were the discs plain. The Hele-Shaw clutch, for instance, as will be shown in Fig. 6, is of the multiple disc type, but the discs instead of being plain are provided with wedge-shaped indentations at a radius somewhat greater than the inside diameter of a disc.



HELICAL SPRINGS

MADE OF STEEL WIRE.

Diameter of Spring from Center to Center of Wire	1/16" A / C	1/16" B	1/8" A / C	1/8" B	3/16" A / C	3/16" B	1/4" A / C	1/4" B	5/16" A / C	5/16" B	3/8" A / C	3/8" B	7/16" A / C	7/16" B	1/2" A / C	1/2" B	9/16" A / C	9/16" B	5/8" A / C	5/8" B
3/4"	8.2 / 1.5	1.7"	65.4 / 24	.85	221 / 122	.57"														
7/8"	7 / .35	2.3"	56.1 / 15.8	1.15"	189 / 76.8	.77"														
1"	6.1 / .64	3"	49.1 / 10.2	1.5"	166 / 51.8	1"	392 / 162.7	.75"												
1 1/8"	5.5 / .45	3.8"	43.6 / 7.1	1.9"	147 / 34.4	1.27	349 / 114.2	.95"												
1 1/4"	4.9 / .33	4.7"	39.3 / 5.2	2.35"	132 / 26.4	1.57	314 / 83.3	1.18"	613 / 203	.94"										
1 3/8"			35.7 / 3.9	2.65	120 / 19.5	1.9"	285 / 62.6	1.43"	557 / 153	1.14"										
1 1/2"			32.7 / 3	3.4"	110 / 15.3	2.26	262 / 48.2	1.7"	511 / 118	1.36"	883 / 244	1.13"								
1 5/8"			30.3 / 2.4	4"	102 / 12	2.66	241 / 37.9	2"	472 / 93	1.59"	815 / 192	1.33								
1 3/4"			28 / 1.9	4.6"	95 / 9.7	3.1"	224 / 30.4	2.3"	438 / 74	1.85"	757 / 154	1.54"	1202 / 285	1.32"						
1 7/8"			28.2 / 1.5	5.3"	88 / 7.8	3.54	209 / 24.7	2.65	409 / 60	2.12"	707 / 125	1.77"	1122 / 231	1.51"						
2"			24.8 / 1.3	6"	83 / 6.4	4"	196 / 20.3	3"	383 / 50	2.42	662 / 103	2"	1052 / 191	1.73"	1570 / 325	1.51"				
2 1/8"					76 / 5.4	4.54	185 / 17	3.41	361 / 41	2.73"	623 / 86	2.27	990 / 159	1.95"	1478 / 273	1.7"				
2 1/4"					74 / 4.5	5.1"	174 / 14.3	3.82	341 / 35	3.05	588 / 72	2.55	935 / 134	2.18	1396 / 229	1.91"	1987 / 366	1.7"		
2 3/8"					70 / 3.8	5.7"	165 / 12.1	4.26	323 / 30	3.41"	556 / 62	2.84"	886 / 114	2.43	1322 / 194	2.13"	1882 / 311	1.89		
2 1/2"					66 / 3.5	6.3"	157 / 10.4	4.72	307 / 25	3.77"	530 / 53	3.14"	841 / 98	2.7"	1256 / 167	2.36"	1788 / 267	2.1"	2453 / 407	1.89
2 5/8"					63 / 2.9	6.94	149 / 9	5.2"	292 / 23	4.16	505 / 46	3.47	801 / 84	2.97	1196 / 144	2.6"	1703 / 231	2.31	2316 / 351	2.08
2 3/4"					60 / 2.5	7.61"	143 / 7.9	5.7"	279 / 19	4.51	482 / 40	3.81"	765 / 73	3.26	1142 / 125	2.85	1626 / 201	2.54	2250 / 306	2.28
2 7/8"					58 / 2.2	8.32	136 / 6.8	6.24"	267 / 17	5"	461 / 35	4.16"	732 / 64	3.57	1092 / 110	3.12"	1555 / 175	2.77	2153 / 267	2.5"
3"					55 / 1.9	9.05	131 / 6	6.8"	256 / 15	5.43"	442 / 31	4.53	701 / 57	3.86	1047 / 96	3.4"	1490 / 154	3.02	2044 / 235	2.72
3 1/8"							126 / 5.3	7.37"	245 / 13	5.9"	424 / 27	4.91	673 / 50	4.21"	1005 / 85	3.69	1431 / 137	3.28	1963 / 208	2.95
3 1/4"							121 / 4.7	7.97"	236 / 12	6.38	408 / 24	5.31	647 / 44	4.56	966 / 76	3.99	1376 / 121	3.54	1887 / 185	3.19"
3 3/8"							116 / 4.2	8.6"	227 / 10	6.88"	393 / 21	5.73"	623 / 40	4.91	930 / 68	4.3	1325 / 108	3.82	1817 / 165	3.44
3 1/2"							112 / 3.6	9.25	219 / 9.3	7.4"	378 / 19	6.16"	601 / 36	5.28	897 / 61	4.62"	1277 / 97	4.11	1752 / 146	3.7"
3 5/8"							108 / 3.4	9.92	211 / 8.3	7.93"	365 / 17	6.61	580 / 32	5.67	866 / 55	4.96	1233 / 88	4.41	1692 / 133	3.97
3 3/4"							105 / 3.1	10.61	204 / 7.5	8.5"	353 / 16	7.08"	561 / 29	6.07	837 / 49	5.31"	1192 / 79	4.72	1635 / 121	4.23
3 7/8"							101 / 2.8	11.33"	198 / 6.8	9.07	342 / 14	7.56"	543 / 26	6.48	810 / 45	5.67	1154 / 72	5.04	1583 / 109	4.53
4"							98 / 2.5	12.08	192 / 6.2	9.66	331 / 13	8.05	526 / 24	6.9"	785 / 41	6.04	1118 / 66	5.37	1533 / 99	4.83
4 1/8"									183 / 5.7	10.27	321 / 12	8.56	510 / 22	7.34	761 / 37	6.41"	1084 / 59	5.71	1487 / 91	5.14
4 1/4"									180 / 5.2	10.88	312 / 11	9.09"	495 / 20	7.79"	739 / 34	6.92	1052 / 54	6.06	1443 / 83	5.45
4 3/8"			A / C	B					175 / 4.7	11.56"	303 / 10	9.63"	481 / 18	8.25	718 / 31	7.22	1022 / 50	6.42	1402 / 76	5.78
4 1/2"									170 / 4.4	12.33	294 / 9	10.19"	467 / 17	8.73"	698 / 29	7.64"	994 / 46	6.79	1363 / 70	6.11
4 5/8"									166 / 4	12.92	286 / 8.3	10.76	455 / 15	9.22	679 / 26	8.07	967 / 42	7.18	1326 / 64	6.46
4 3/4"									161 / 3.7	13.62	279 / 7.7	11.36	443 / 14	9.73	661 / 24	8.51"	941 / 39	7.57	1291 / 59	6.81
4 7/8"									157 / 3.4	14.35	272 / 7.1	11.96	431 / 13	10.25	644 / 23	8.97	917 / 36	7.97	1258 / 55	7.17"
5"									153 / 3.2	15.09	265 / 6.6	12.58	421 / 12	10.78	628 / 21	9.43"	894 / 33	8.39	1227 / 51	7.55
[illegible]	57/64"		1 25/32"		2 11/16"		3 9/16"		4 15/32"		5 3/8"		6 1/4"		7 5/32"		8 1/32		8 15/16	

A- MAXIMUM CARRYING CAPACITY IN LBS.

B- DEFLECTION AT THIS LOAD FOR A SPRING WITH 10 COILS.

C- COEFFICIENT OF STIFFNESS, WHICH CAN BE USED FOR CALCULATING THE DEFLECTION OF A SPRING WITH N COILS: $\delta = \frac{P.N.}{32\cdot C}$

The utility of the wedge-shaped indentations would be the same as that of the cone bearing surfaces of the cone clutch.

e Hele-Shaw clutch it is not necessary that the discs should upon their faces, since the clutching effort may be con- to the engagement of the wedge-shaped depressions. A ı of this sort bas but a small bearing surface per disc, making each disc very effective, and as to the effect of ıigh pressure on the small surface, it is compensated for e use of a considerable number of discs. Tbe discs them- ; are very thin, and it is possible to use a considerable er of them within limited space. The other features of lutch will scarcely require attention, since they are plainly ı in the illustration, and tbe idea here is to point out the ence between this and simple multiple disc clutches.

Concerning Spiral Band Clutches.

Mercedes type of spiral band clutch is probably the best ı of any in this class. It consists essentially of a flat l spring wrapped around a hardened steel drum. One f the spring is anchored to the driving member and the end is actuated by means of a spring pressure through a arm. Intervening the spring and the lever arm is a slid- ɔne with a face-angle of about 52 degrees, ending in a and a slight reduction in the diameter beyond. The pressure is thus multiplied, first through the good office lever arm; second, by the wedging action of the sliding and, finally, by the wraps of the helical band around the There are usually from four and one-half to five wraps band on a drum approximating 6 1-2 inches in diameter, ıg slightly in this respect in the different types of cars. um is of hardened alloy steel, the texture of which metal ery close as to permit of extremely bigh pressures with- y eroding effect at all. If the drum is hard, it is true ıe helical bands must not only be hard as well, but of rength, since the pull on the wrap nearest to the anchor- ıches a very high figure indeed.

e is a certain amount of complex mechanism in con- with clutches as above described, and the clutch, Fig. 7, t belongs to the same genera of clutches, is designed e idea of eliminating the complex features. In this spiral utch the helical band is wrapped around a drum of the pe; one end of the flat band is anchored to the driving , while the other end is free. To engage the clutch the tself is caused to telescope the helical spring and by a ce in angle between the drum and an outside housing end of the spring is pinched in such a way as to con- ıe same, thus affording the requisite negative torque to t the torque of the motor.

is type of clutch freedom from lever arm troubles is a lent feature, but if the lever arm is eliminated, high has been substituted instead, and this high pressure ɔn a small area at the end of the helical band, which n time erode the band itself or cause it to burrow into ace of the drum in juxta-position. These evil influences be counteracted if the materials used are of a character l the greatest possible hardness witbout brittleness. In wo cases it was suggested that a hardened tool steel in- ɔe used at the point of maximum pressure. This might od idea, but the author does not know of any case in is has been taken advantage of.

the industry has developed a considerable number of now obsolete, yet even so there are one or two ideals sist in coming to the fore at ratber frequent intervals. ɔr instance, the question of an individual clutch for the speeds in the gear-set. This scheme has been used ensively, and has many advantages, among which might oned the fact that the gears are retained in constant scheme of this sort resolves itself into the question of or not a separate clutch for each gear is preferable to clutch for all of the gears and a sliding mechanism by f which the gears may be engaged. There are very ırently whose preference seems to run in the path of clutches to get away from clashing gears.

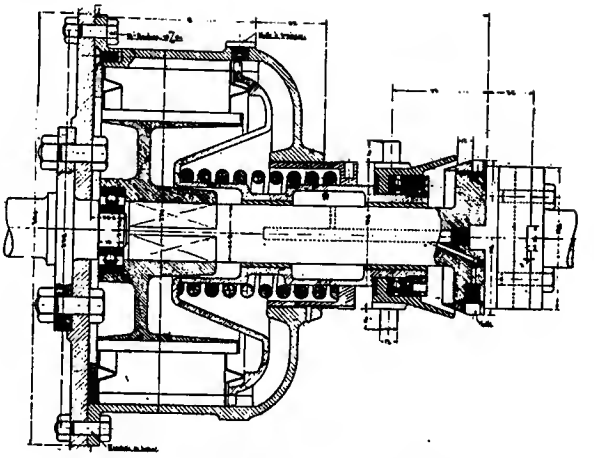


Fig. 6.—Sectional view of the new Hele-Shaw clutch.

There is still one more idea that seems to be buoyant, although it has not been exploited to any great extent up to the present time. This idea has for its basis the use of a unit clutch in the ordinary way, and the gears in the gear-set in constant mesh. In order, however, that the speeds may be changed, sliding cones provided with slots, teeth or other means of engagement afford the methods by which the respective gears in proper selection are locked in place and set to perform their functions.

Obviously this is a means for side-stepping the clashing of gear teeth, hoping thereby to save them from the results of clashing, but it must be plain to even a casual observer tbat the trouble is merely transferred to another point. It seems to be true that there is less wear and tear due to the clash meshing of gear teeth than follows the use of other means of locking members, such as pins, a screw-driver joint, etc.

The Question of Lever Advantage.

It was said that if the engaged faces of the clutching members were direct the pressure of the clutch spring would have to be sufficient, in view of the coefficient friction of the materials used for the clutching purpose. It was pointed out in the case of the Mercedes clutch that an intervening lever arm might be devised in some way as to multiply the pressure of the spring, and it was there intimated that a cone-face might be so shaped as to afford a further lever advantage, due to the wedging action. The use of the spring tabulation previously given will be much facilitated if information is at hand bearing on the question of the lever advantage.

It is easy enough to see to what extent a lever arm will decrease the needs by way of a spring. It will be remembered also that a means was afforded for determining as to the magnitude of the advantage if the simple wedge is used in connection witb a lever arm. Nothing remains, therefore, but to exploit

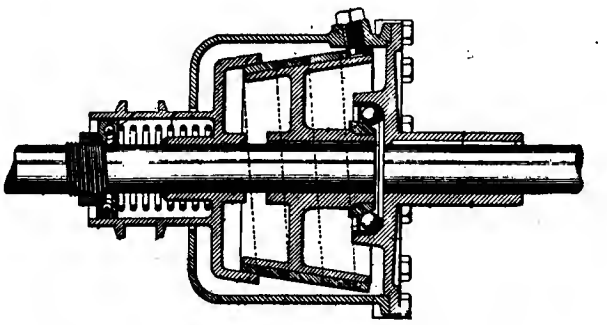
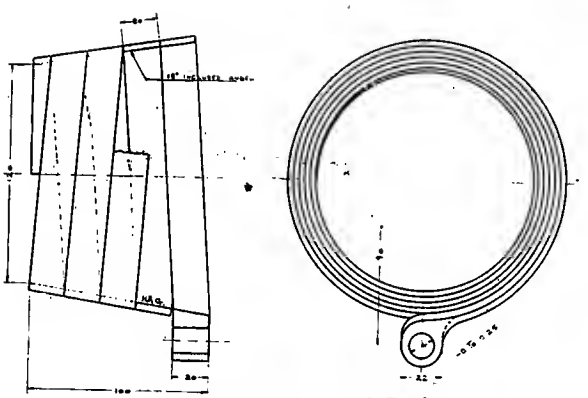


Fig. 7.—Cross section of the Ellsworth-Fay clutch.



The Ellsworth-Fay Clutch Band.

the means by which the advantages of the cone-type of clutch may be fixed.

The first question is one involving the disengagement of the clutch. To engage is a necessity, and to prevent slipping is desirable, but, as before stated, we must know that the disengagement will be sure. With metal to metal contact, considering such metals as are likely to find their way into clutches, the disengagement would not meet with any unusual conditions. If, on the other hand, leather (or such other materials as would act in the same way) be used, it can be the cause of sticking, and the disengagement might be attended with unusual difficulties, *or becomes quite impossible.*

If a cone clutch is allowed to slip for a time it will get hot. If it is then allowed to stay engaged for a considerable period it will disengage with difficulty. The prime reason for this lies in the fact that during the period of slipping the female member (of metal) will be heated more than the male and will expand more. The members will then nest closer and when the clutch members cool off the engagement will be under far greater pressure than that due to the normal pressure of the spring.

Leather faced cone clutches, then, are not suitable for the class of work in which slipping is intentional, with a view to controlling the speed of the car, even for a short time. The expansion of the male member due to heat will be as follows:

$$e = (1 + f \times {}^{\circ}F)\ D.$$

In which

e = total expansion due to heat.
f = the coefficient of expansion of the materials.
°F = increase in temperature in degrees F.
D = mean diameter of the member, in inches.

It will be well to take into account the fact that the male member is insulated as against heat, the leather acting as an insulator, so that little or no expansion will be noticed in that member.

Since slipping cannot be prevented with certainty, an allowance should be made in the designing of the pedal system, such as would assure to the operator unquestioned ability to apply enough pressure to enable him to disengage the clutch. Since there is a limit to the ability of the operator to apply pressure, there should be such a lever advantage provided as would assure the disengagement of the clutch with a predetermined effort well within the ability of a person of no great strength.

If it can be assumed that a person of no great strength can press on a pedal on a basis of 100 pounds, then it is safe to say the clutch should be designed to respond to that pressure under the most severe conditions. Under ordinary conditions, however, the pressure should not exceed, say 40 pounds. This latter pressure would take into account the resistance of the spring only, on the assumption that normally sticking would not ensue in reasonably designed clutches, in correct alignment.

In a cone clutch the resultant of the pressure of the spring will be greater than that pressure. The coefficient of friction, however, undergoes the equivalent of a change, in that the coefficient becomes much diminished during the time the members are engaging, because of the manner of the engagement. This is explained on the basis of the effect of screwing one member into the other, as it were, which is what happens, since during the act of engaging the driving member if at a higher angular velocity while the driven (male) member is being pressed deeper into the engaging position. The result is, a point on the periphery of the male member will describe a spiral orbit during that period.

Members that cannot be telescoped at all by fair axlewise motion may readily telescope if the spiral motion is imparted to the one of them. It matters not at all if there is an actual diminution in the coefficient of friction, since the resultant of the process is the equivalent of a diminished coefficient.

Pressure on cone faces:

$$N = \frac{P}{\sin \alpha + \text{tang } \phi \cos. \alpha} = \text{total normal pressure between cone faces.}$$

$$P = N \sin \alpha$$

The motor ability must be less (somewhat than the value of N). This ability would be found as follows:

$$P^1 = \frac{2 \pi r S}{\text{H.P.} \times 33{,}000}$$

in which

r = mean radius of the cone clutch.
s = angular velocity r.p.m.
H.P. = actual delivered horsepower of the motor at the speed s.
P^1 = pull, in pounds, at the periphery of the cone clutch.
P = $P^1 \times 2$ for clutches that should sustain under severe conditions.

SOMETHING ABOUT SPRINGS.

If a short leaf breaks, even though it may be an intermediate member of a spring, it is a good sign that the camber of the broken leaf was greater than that of the other leaves. Since the fiber strain would be the same in all the leaves were they all of the same thickness, and curved to the same radius, it is fair to reason that any one leaf curved to a shorter radius will be subjected to an excess fiber strain and will rupture the sooner in consequence.

It is very likely that a spring on the whole will work better after the short leaf, with its excess camber, is eliminated. At all events, such an occurrence on the road should not be a source of great annoyance to the motorist, since the remaining unbroken leaves will be in no greater danger of breaking than they were before. Indeed, the unbroken leaves may be in prime condition, since it is possible that the broken leaf of the excess camber sustained more than its share of the work up to the time of rupture.

Sometimes these seemingly unaccountable breakages of intervening plates (leaves) in the springs are due partially to excess camber and for the remaining part to loose clamping. No spring of the laminated type will sustain in service, if it is not tightly clamped. It is not enough to tightly clamp the springs to the spring seats on the axle. The material should be superior to that of ordinary vehicle bolts and of greater section, because much is to be gained by affording seat of the radius in conformity with the radii of the spring plates. A leather facing skived to the curvature of the main leaf of the spring is of great value, primarily because it lends friction to the clamped members, and again because it yields to the high spots, and more closely nests the clamped spring to the seat. A properly clamped spring to the spring seat with an intervening leather pad will scarcely give trouble at all.

It is a waste of time to use spring clamps of indifferent material and small section, in work of this character, because the clamp itself will yield, and allow the spring to go adrift. The clamps must be of good material and of adequate section to maintain a tight relation, in order that tight clamping may be a continued condition.

LETTERS INTERESTING AND INSTRUCTIVE

PERTINENT POINTERS FOR THE SALES END.

litor THE AUTOMOBILE:

[1,597.]—I would like to ask through your "Letters Interesting id Instructive" if there are any automobile manufacturers who fer premiums to users of their machines, making ths bsst sug-stions as to points of improvement on their respective cars. Ars ers any automobils manufacturers who make it a point to kesp iplicats parts of their machines in all large cities, so that hroken irts can be quickly repiacsd? Is it asking too much of a dsaler hen he triss to sell you a car if he expects to carry duplicate parts stock?

Would not an effort on ths part of automobile manufacturers to elp mors thoss to whom they have sold machines in the past, an to make such heavy cuts to facilitato the sale of new onss? ake, for instance, ths cash register people and the Remington pewritsr people; once a customer they count you as a friend and istomer always, and ars continually eending you such information will help you in getting all possihis out of ths purchasss that ou may havs made. R. T. H.

Port Norfolk, Va.

So far as our knowledge extends, there are no American akers who are offering any premiums for information of this ind, though prizes have been held out for records of the low-st maintenance expense on the greatest mileage, and at least ne of these is still effective. There are few of the larger merican automobile manufacturers who do not carry very com-lete stocks of replacement parts in their branches in different ities, and several have made it a point not only to sell these arts at prices corresponding to their first cost on the machine self, but also to supply them very promptly.

The question regarding parts would be a most natural and gical one, and is usually asked under such circumstances. We gree with you most heartily regarding the value of the policy f "once a customer, always a customer," and are under the npression that this is closely followed by the majority of well-nown makers.

HOW TO LEARN THE AUTOMOBILE BUSINESS.

litor THE AUTOMOBILE:

[1,598.]—I am employsd in an automohile repair shop where I n supposed to bs learning the automohile business, but am not ven a good opportunity of doing so, owing to being givsn other rk to do. I would like to have you inform me whether thsre is t soms way of learning this without interfering with my work d without going to an automohile school. Would it henefit me y in my work to take up the study of gas engines?

Chicago, Ill. OTTO L. HARTMANN.

You do not state what branch of the business you wish to rn, whether designer, salesman, repair man or chauffeur, or at is the nature of the work to which you are assigned; but this work is in any way connected with the repair shop, it ght to be of use to you. If not, why not try some other repair p? That is certainly the best place to learn. We do not ieve that it is possible to learn the automobile business, or other business, without devoting one's whole time to it. The dy of gas engines would certainly be of benefit to you, but would be better to get a practical knowledge of them first.

ANOTHER WHO UTILIZES HIS OLD CASINGS.

tor THE AUTOMOBILE:

,599.]—I find it unnecessary to rivet or tis on with rawhide old s with beads cut off. Simply put on with the new tire elack and up. I have soms that have been run a thousand miles over h mountainous roads and they have not crawled one-sixtieth n inch hy a mark I made. This is much less work to remove, se of a puncture. OWEN B. AMES.

rfield, Ms.

here is certainly no advantage in troubling to rivet or lace he old casings when it is desired to use them to protect ones if they stay in place when simply put on slack and blown up. This simplification of the process should en-age other automobilists to try it—many of whom, no doubt, ated at the work involved in the other methods.

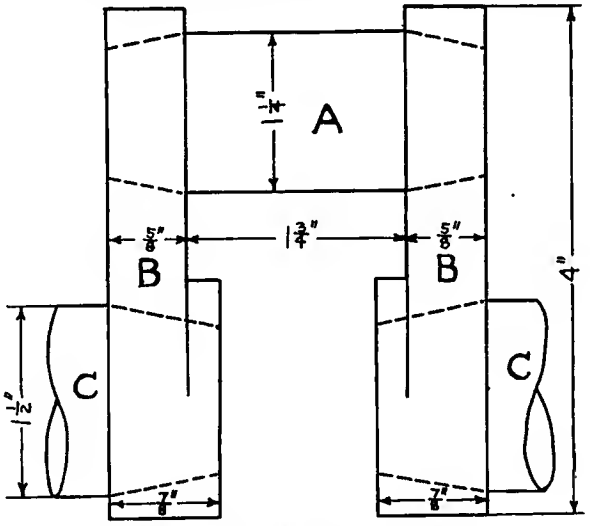
PARTICULARS OF A BUILT-UP CRANKSHAFT.

Editor THE AUTOMOBILE:

[1,600.]—Enclosed is a rough sketch of a huilt-up crankshaft with dimsnsions. My idea is to have the discs B mads of cast iron or phosphor hronze and to have ths crankpin C and wristpin A tapered and keyed to the discs. The dimsnsions given are the only ones possibis for me to use. The pins I plan to have mads of tool stssi, hardened, ground, and highly polished. Do you think a crank of this kind would give satisfaction? Thank you for any help you may give me. BUILDER.

New York City.

It is difficult to tell what satisfaction your crankshaft will give without knowing the size and other data of the cylinder. Moreover, your object in making the pin smaller than the main journal is not apparent. You say these dimensions are the only ones possible for you to use, but it would seem that the requirements of such an important part of the motor as the crankshaft should not be subordinated to any others. There is no particu-



Proposed Design for a Built-up Crankshaft.

lar advantage to be gained by making the crank cheeks discs instead of rectangular, as shown in the drawing; the extra material would only be wasted. The drawing does not show nuts to hold the discs on the tapered ends of the pins, but these, of course, should not be omitted. We think it would be the best economy, however, for you to have your crank forged in one piece by some concern with the proper facilities.

PUZZLING KNOCK WHEN CLIMBING ON THE HIGH.

Editor THE AUTOMOBILE:

[1,601.]—In your "Letters Interesting and Instructive" pleaee give me some advics on the following: I have a 35-horsepower, four-cylinder, shaft drive, '08 car. There is a certain kick in this car when pulling up a heavy grade on the high gear with ths throttis wids open. This kick or hack-lash feels as if the whole machinery was locked. The car vibrates the sams as a car does when, in coasting down hill with the motor dead, the clutch is suddenly dropped in to pick up the motor; that is, a sudden jarring or jerk hackwards, iiks the geare locking in ths differential. Ths car has always done this.

I thought at first that it was in the rear axie, it being the sams sometimes as if the bevel gears should fail to mesh and ths testh should lock on top of each other. On examination of ths axle, I found ths hevel slightiy cut. I put in a new axle, which I have run for 1,500 miles, which is not worn, but still have the same trouble. Sometimes on releasing ths clutch when this kick occurs ths car will coast for a few feet, but on dropping in the clutch again to pick up ths motor it will vibrats as hefore.

When the muffler is cut out it seems as if this kick cómes on a

weak explosion; at other times the explosion seems about half trong. This, of course, occurs when the car is pulling about 80 cent. of its capacity on an up grade, the throttle wide open, yet oes not feel like a miss. The position of the spark lever makes ifference. Sometimes the car will kick several times and still up and go ahead, at other times it will kick and stop. The ng is exactly as if the machinery was suddenly locked. I have experts, some from other cities, trying to locate this trouble, all have failed. I will value the car $200 higher the minute I te this trouble. Can you give me any idea of where to look her? SUBSCRIBER.

uluth, Minn.

rom your description it seems as if the trouble ought to be in running gear or transmission rather than in the motor. How- r, replacing the entire rear axle should certainly have stopped kick if the cause was in that member, so we should suggest mining the change-gear. It is possible that the reverse pinion / be loose and slip partially into mesh when the car is in- ed on a grade, or the shifting mechanism may allow the ing member for the low gear to engage, if the change-gear is the selective type. In the latter case, however, this looseness ild have made itself apparent in other ways. Another possi- ty is looseness in the universal joints. If the "kick" seems to ie when the car strikes a bump in the road it may be that the ling joint in the rear universal (if the drive shaft has two) erferes with the action of the universal itself. We confess t it is a puzzling case, and we would be glad to hear from any our readers who have had similar difficulties.

WILL TWO PORTS RESULT IN MORE POWER?

ttor THE AUTOMOBILE:

1,602.]—I have been a reader of your publication for about two ars and have every copy where I can locate it at any time. My nner of preserving the copies is to lay two months' issues (about ht or nine volumes) together evenly, then clamp them there th two 18-inch boards and two 3 3-4 by 1-4-inch bolts, then bore ir 1-4-inch holes through the whole pack about three-quarters an inch from the backs, and then lace them with common shoe ings. This keeps the copies where they can be referred to at y time and is little bother, whilst the cost is next to nothing. I would like to inquire if the power of a three-port two-cycle otor would be likely to be increased by converting it to a two- rt motor? SUBSCRIBER.

Moline, Mich.

While your method of preserving back numbers of THE AUTO- OBILE is certainly one that makes for solidity and durability, we ould think the same laudable objects might be obtained, as has en the case in automobile construction during the past five ars, with a little less avoirdupois. As you say, the cost of our method is not very great, but for actual service, a good ady-made binder obtainable for very little from any stationer, ould compare as good steel does to a cheap casting.

Specifically, we cannot say what will happen if the particular otor to which you allude were to be changed over from a ree to a two port proposition. Taking an abstract case, the spective motors properly designed and suitably constructed ould compete with each other under favorable circumstances s respects ability to deliver power.

GRAPHITE AS A CYLINDER LUBRICANT.

ditor THE AUTOMOBILE:

1,603.]—Kindly tell me if graphite is a perfect cylinder lubricant ithout being mixed with oil, in an engine in which the short- circuiting of the ignition current is of no importance. How high a emperature will graphite stand without losing any of its lubri- ating qualities? Does it leave a carbon deposit similar to that of il? Can it be fed through a gravity-feed oiler? READER.

St. Louis, Mo.

Graphite is one of the best lubricants known for any purpose. The only objection to its use in automobile cylinders is that it is ikely to clog up the oil pumps and leads. Its lubricating qualities are independent of the oil, and if you can devise a reliable method of feeding it without mixing it with oil you will certainly get atisfaction. It will stand any temperature usually found in a gasoline engine cylinder; the temperature at which it decomposes will naturally depend on the grade, and the manufacturers will be able to advise you better concerning this. A gravity-feed oiler would not be suitable; force-feed is necessary. But why worry about graphite if you have invented an engine in which the short-circuiting of the ignition is of no importance?

IS THE MAGNETO LESS TROUBLESOME?

Editor THE AUTOMOBILE:

[1,604.]—Will you please inform me through "Letters Interesting and Instructive" if you think a magneto for a 30-horsepower four-cylinder car is worth the extra expense? Also, what will a good one for the jump spark system cost? Will it be any more trouble to keep in working order than the battery system, with batteries, coils and commutator? PROSPECTIVE OWNER.

Asheville, N. C.

The magneto will certainly afford you adequate compensation by way of reduced ignition troubles and increased power, in spite of the fact that you can pay as much as $200 for a magneto, inclusive of its fittings, ready for installation. Magnetos for the jump spark system can be had at prices ranging between $100 and the high limit as above set down. The magneto will be less troublesome to maintain, requiring but little occasional care, by way of cleaning and oiling; during its natural life, which for a good magneto, is equal to the life of the motor.

OIL FOR COOLING IN COLD WEATHER.

Editor THE AUTOMOBILE:

[1,605.]—I would like to inquire through your "Letters Interesting and Instructive" whether a very thin oil could not be used for cooling in the winter in place of an anti-freezing solution. Also if the results would be as good, and if the cost would be any more, and how often the oil would have to be changed to get the best results.

Boylston Center, Mass. A. R. BENNETT.

Oil has often been used for this purpose, and we believe that one of the large manufacturers advertises a special brand for use in cooling systems. The results will be all right, but you will probably find the oil more expensive than the ordinary calcium chloride solution. There would be no necessity of changing the oil during a single season, but more would have to be added from time to time to make up for evaporation. Perhaps some of our readers who have used oil can give you the benefit of their experience.

MAXIMUM SPEED OF AUTO AND CYCLE MOTORS.

Editor THE AUTOMOBILE:

[1,606.]—What is the highest speed attainable in four and six-cylinder four-cycle automobile engines, and in four-cylinder motor-cycle engines? G. L.

St. Paul, Minn.

The speed depends on the load, the size of the motor, and many details of its design. For the average automobile motor, either four or six-cylinder, the maximum speed under load may be taken at about 1,500 r.p.m. If the motor were allowed to "race," running idle, it might turn as high as 2,500 r.p.m. For motorcycles, the figures might be about 2,000 and 3,000 r.p.m., respectively. In motors for every-day service, the piston speed, under load, rarely exceeds 1,200 feet per minute, and this, of course, determines the number of revolutions.

REGARDING THE FORM OF LUBRICATION.

Editor THE AUTOMOBILE:

[1,607.]—The recent stringent measures taken by the police in New York City against the drivers of machines emitting smoke from their exhaust and the probability of equally stringent action on the part of local governments in other districts, render it necessary for manufacturers either to subtract from the efficiency of their cars or to revise the systems of lubrication which they have adopted. Since in the great majority of cases the only sign of sufficient lubrication for the engine has been the emission of a slight blue smoke from the exhaust, makers, in many cases, advise customers to make sure that their exhaust is smoking continuously.

Realizing the hardships that such regulations impose upon makers of such cars, it is not out of place to consider the various general efficiencies of lubricating systems in vogue. The most usually employed is the splash system, in which the connecting rod-ends whip the surface of oil in the crank base, so throwing

to the cylinder walls and other moving parts. In the crudest rm—the most common, by the way, of this system—the oil is d direct to the crank basee and only about 5 per cent. of it is fective for lubrication. If the oil level is too high, the engine ll foul and the exhauet smoke; if too low, the engine gets no , with disastrous results.

The anti-smoke properties dspend entirely upon the accident of s driver accurately gauging the feed to the crankcase to supply as used, a condition which varies, however, with the imme- ite mechanical quality of the car and also with different oils.

n an improved form tbe oil, in considerable quantity, is car- d in a lower chamber or sump, whence it is automatically mped to the crank basee, being kept therein at a constant level means of a simple overflow device. This system is infinitely ter than that previously mentioned, since about 60 per cent. the oil carried may be used before trouble will occur. But the stion of a smoky exhaust depends upon a very accurate gaug- of the capacity of the overflow from each and every one of crank bases. Moreover, there is in this as in every splash tem, the serious disadvantage that the copiousness of the lubri- ion bears but little relation to the work imposed on the engine.

ttached force feed lubricators entail a complication of tubes ly to clog or leak and again depend upon an accurate setting, ch necessarily varies with different engine epeeds and for which appy average only can be struck, a state of affairs not in ordance with the high efficiency necessary with the modern omobile built for a critical purchaser.

y far the best system in every way is that in which a force p draws oil from a sump, forcing it by means of suitable s in the main bearings through passages in the crankshaft to crank pins, thence to the piston pine, whence it escapes back he oil reservoir, the cylinders being lubricated by the oil wn by centrifugal force from the crank webs. Since the force p ie driven from the engine, the pressure in the oil system rectly proportional to the speed of tbe engine—the flow equally as is also the amount thrown from the crank webs to the ders. It is this system—to some makers a new idea—which leveloped on the Marmon car eome six years ago and which ave always used. It is this system also that has rendered ble—as records show—the extraordinary speeds for extended ds which have been made upon the Brooklands track in Eng-

With it not only is perfect lubrication of every engine part utely insured, bnt the whole quantity of oil in the system may ed up befors lubrication fails.

vided the by-pass is correctly set, it is impossible to make ngine smoke; the whole system is integral with the engine ut exposed pipes to leak, or indeed any to clog. Once tested he by-pass set, the driver may forget once and for all, ex- or a very occasional replenishing, his lubrication system, and e happy in immunity from an annoying arrest for an offence is primarily due to the maker neglecting to use the best ble system for that most important of all the functions in eration of automobile mechanism—lubrication.

rite this, since, with many low-priced and attractive cars the public for the coming season, it is necessary for a to examine such matters closely, both to comply with a o-be universal regulation and for the sake of his machine's l efficiency and freedom from repair.

napolis, Ind. HERBERT H. RICE.

I ENTHUSIAST ON UNREASONABLE LAWS.

THE AUTOMOBILE:

3.]—The canal came first, then the steamboat, then the railroad; the horse-drawn street car was superseded by ole car, and it in turn by the electric street car. The jin- or man-drawn cart, was supereeded by the ox-team, and it horse—and it in turn by the automobile. And so it comes to iat we to-day are enabled to cover great distances quickly e fast becoming one great community. As a natural se- to the fulfillment of the inexorable law of progrees has come the advent of the automobile. The same spirit of antedi- ideas that opposed the progress of rapid transit heretofore are bitterly opposing the automobile. It is the tendency to go to extremes, first too far one way, and then too far ier way, until finally a middle course acceptable to the iajority is reached.

present road laws are the extremes of restriction, unjust criminating detrimentally to the automobile. Towns, vil- nd cities that pass speed limits of 8 to 10 miles an hour ot the mark of reason and senee. If laws were passed the speed of automobiles to 10 miles in congested sections s and cities and 15 miles in the free sections, with 20, 2b iles in the conntry, they would be reasonable, would be dhered to, acceptable to all sane automobilists, and work ;ker than any other measure the desired end of safety. is an hour, except in the most congested business sections, tly ridiculous. Fifteen miles an hour is the happy medium and safe. An automobilist who will drive even out in the open country over 30 miles an hour ehould not be fined, but sent to jail, because he has gone to the other great extreme.

Now, what we are advocating is a reasonable, fair, and happy medium of speed limitations. It is what will come ultimately, and the quicker adopted the quicker all drivers of automobiles will fall in with hearty accord and aid in its maintenance.

Oil City, Pa. ONE AUTOIST.

"INDUCEMENTS" TO AUTO SALES AGENTS.

Editor THE AUTOMOBILE:

[1,609.]—A sales company controlling the sales of a popular car in the State of Minnesota offer the following "inducements" to dealers: The dealer must deposit part of the payment of five cars without any security whatever with the sales company, must not sell any other car without permission from the sales company, and must keep in stock four different styles of the car for demonstra- tion. The dealer must sell at the price which the manufacturer may eet, no matter whetber below what he hae paid for the car or not, and if he fails in any particular to live up to the contract his deposit is forfeited to the sales company. This business proposition seems to me to be the worst jug-handled, sucker-catching scbeme that ever went under the name of iegitimate business. The sales company ask the dealers to furnish them capital to do business with, with absolutely no security or recompense, arranged so that the deposit may be declared forfsited at their own sweet will, and do not even agree to furnish the cars which the deposit is part payment upon. They limit the business of selling to their permis- sion and compel the dsaler to keep in stock models which may not be salable in his locality.

In my opinion, this method of selling automobiles to dealers will spell suicide for the manufacturer if it is rigidly enforced. It will stimulate the most zealous antagonism to the car and will enlist good agents in the ranks of salesmen for other cars.

Marshall, Minn. A. D. HARD, M.D.

A GASOLINE SPRAY FOR CLEANING MOTORS.

Editor THE AUTOMOBILE:

[1,610.]—I note letter No. 1,587, by F. C. Snedeker, in regard to cleaning the engine of an automobile witb gasoline spray from a tank in which the air has been compressed. Will say for his infor- mation, that in 1906 I received a circular from a concern in Utica, N. Y., in which one of their speciai offers was the "New Lightning Automobile Cleaner," consisting of a four-gallon galvanized iron tank with air pump attached. They state that one gallon of gas- oline and one pint of kerosene put in the tank, and the air of same compressed, would instantly remove grease baked on the engine.

This appealed very strongly at the time to me, but never having heard of it before or seeing it advertised after, I thought perhaps it was not much of a success, and so failed to carry out my intentions of ordering one. The price was $6.

I agres with Mr. Snedeker that I believe something on this order would be a very useful article for owners of automobiles, and would find a ready sale. I am writing tbe Utica concern to-day to see whether they still manufacture tbis cleaner.

Middletown, Conn. G. ELLSWORTH MEECH.

DR. KRESS GETS MANY DECARBONIZER INQUIRIES

Editor THE AUTOMOBILE:

[1,611.]—Since my letter in the October 1 issue, headed "Concern- ing the Use of Decarbonizer," I have received many letters asking for more complete information. Since I do not have the time to answer all these numeroue letters. I would ask that you make known that it is the Radium decarbonizer which I use, and the oil is of the Monogram brand, and the car which I drive is a Franklin. The other night I was called out of my bed to answer a long- distance telephone from Philadelphia in regard to more complete information.

I have no personal interest in the decarbonizer, the oil or the car, and simply wroto the original letter for the benefit of my fellow automobilists and thought they could get some good results from my own experiences. PALMER J. KRESS, M.D.

Allentown, Pa.

ANOTHER CURE FOR POPPING CARBURETER.

Editor THE AUTOMOBILE:

[1,612.]—In answer to No. 1,578, this will probably cure the trouble: Put in a few set of dry cells; see that vibrator points are clean; adjust vibrator to give a good hot spark. Then turn needle valve on carbureter entirely down, and open it three-quarters of a turn. Now start engine, and move needle valve up or down a very little until motor runs smoothly, and go on your way rejoicing. Be sure to connect up dry cells as the instruction book says, six cells in multiple series. I have a Mitchell, too.

Corsicana, Tex. CLARENCE THOMAS.

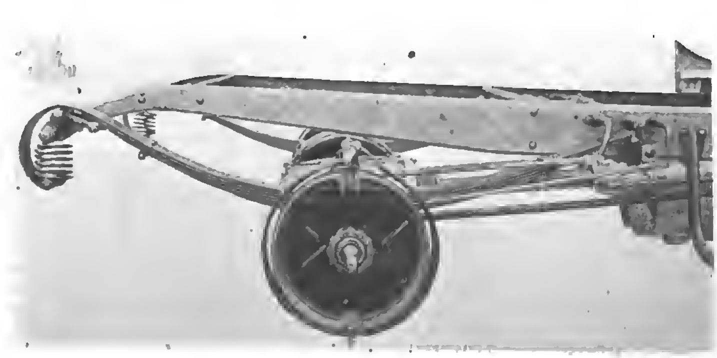
The Ramblers for 1909

THE Rambler design for 1909 exemplifies the usual policy of continuing former models, with only such refinements in etail as experience has shown to be desirable. The two-cylinder 2-horsepower and the four-cylinder 34-horsepower cars follow ery closely the coresponding designs for 1908. There is, howver, an entirely new four-cylinder model of 45 horsepower, elling as a roadster or touring car at $2,500. Various styles of unabout, touring or limousine bodies may be fitted to this hassis. The two four-cylinder models are exactly alike in esign, differing only in motor size and power, wheel base, tire ize and body capacity.

Refinements in Motor Design.—The 34-horsepower motor as cylinders 4 1-2 inches "square." As used in 1908, it delivered 2 horsepower, but increasing the size of the valves and the arbureter capacity justified a higher rating. As in preceding models, the most distinctive feature of the motor is the offset rankshaft. This proved in practice an even greater advantage han was expected. The flexibility and power at low motor peeds are further augmented by an increase of twenty-six pounds n the weight of the flywheel rim. The makers claim that it is ow possible to throttle a four-cylinder Rambler as low as three miles an hour on the high gear. The two-to-one gears have been oubled in width, and the driven gear is now of rawhide; with hese improvements and careful machining, the gears are absoutely silent. The crankcase is in one piece, the crankshaft with ts assembled bearings being inserted through the rear end. Both he main and the connecting rod bearings are of the marine wedge ype, and may be easily adjusted through a hand-hole 8 x 23 nches on the rigbt side of the crankcase. It is hus no longer necesary to remove the mud apron and the oil pan, and, to still further facilitate adjustment, the front mud guards have been made of the quick-detachable type. The exhaust manifold has been raised to allow easier access to the valve stems and springs and the adjusting nuts. The relief cocks in the cylinders are of a new type. They are, in fact, check valves, which are held closed by springs and by the pressure in the cylinders. The higher tbe pressure the tighter they become, preventing leaks through wear.

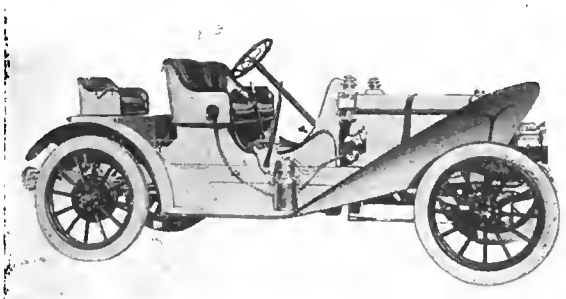
Passing to the ignition system, it will be noticed that the timer has been placed in a higher and more accessible position, and flexible cable is now used to carry the primary as well as the secondary current. The spark plug terminals are of a new and convenient design. The wire ends in a fiber block, which is attached by a bracket to the upper water pipe. A thumb screw locks the bracket in any desired position. From the block a metal strip extends to make contact with the flat metal bead of the spark plug. Should missing occur because of soot on the spark plug points, raising the fiber block slightly will form a spark gap between the strip and the plug head, and the missing will be temporarily overcome without changing the plug. When it is desired to remove the plug the fiber block may be raised clear, and the cable need not be disconnected.

The pump is now driven from a straight shaft on the side opposite the camshaft. It is entirely detached from tbe crankcase, so that if a leak should arise water cannot enter the two-to-one gear housing or the crankcase. The end of the pump shaft is arranged so that a magneto may be coupled on if desired. The standard Bosch high-tension magneto will be carried in stock and furnished when ordered at an extra cost of $150, forming a complete double ignition system. This specification will cause no delay in the filling of orders. The magneto is located at sufficient distance from the crankcase and the oiler to allow easy access for inspection and adjustment, and may also be readily removed.

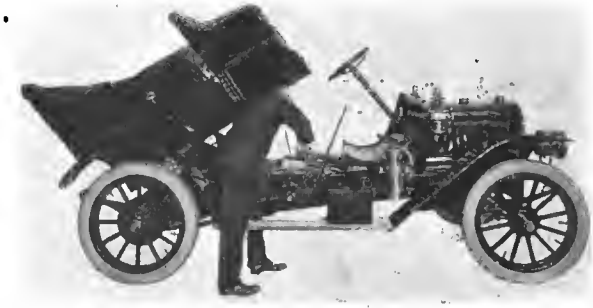


Mounting of the Rambler New Triple Action Springs.

Lubrication is cared for by a mechanical force-feed oiler, of a capacity 50 per cent. greater than that used in 1908. The oiler is also located rather farther back, to permit better access to the magneto. It is placed in an oil tray arranged to catch any overflow, and flying oil from the flywbeel and clutch is prevented from spreading by a metal guard.



Rambler Type 44 A-1, Four-cylinder Roadster.



Motor Accessibility on the Two-cylinder Rambler.

Concerning the Transmission.—The inverted cone clutch formerly used has been replaced by the direct thrust type. The cone is made of pressed steel instead of aluminum, thus being less liable to distortion from severe use, and the surface bas been increased about 50 per cent. It differs from other clutches principally in tbis greater surface and in the arrangement to vary the tension of tbe spring. Tbe adjustment is so easy and so accessible that it can be attended to on the road at any time, thus eliminating any excuse for burning clutch leathers. Studs extending from the inner surface of the cone contain spiral springs placed under the leather to insure gradual engagement. To stop the spinning when the clutch is released, a camel's hair block is placed in the bearing of the releasing arm to give a braking action.

Tbe change-gear remains the same as before, but a slight change has been made in the shifting mechanism. The reversc gear is engaged by bringing the lever directly back of the position for the first speed forward. To prevent an inexperienced operator from going into reverse in attempting to change from first speed to second, a bell crank is so placed on the quadrant as to interfere with the backward movement of the lever into the reverse slot. When it is desired to engage the reverse the crank may be displaced by pressing a button conveniently set in the floor.

A feature which will be appreciated by owners is the provision for brake adjustment. Both the foot and the lever brakes may be tightened by shortening the rods which connect the pedal and lever to the equalizing shafts. At the front end of these rods are placed larged thumb nuts easily adjustable by hand. It is possible to do this on the road while tbe car is running. The brakes are of the same size as before, but tbe leverage has been increased by changing the position of tbe brake shoe and band operating lever. Formerly the brackets supporting these levers were of such design as to limit their backward movement. The brackets have now been hollowed out, so that when at rest the brake levers stand at an angle of 45 degrees to the rods.

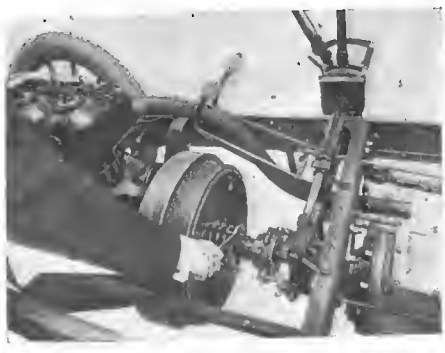
Few Changes in the Running Gear.—The Rambler screw-and-nut steering gear, tested by six years of service, is used again this year. The parts are heavier, and better provision is made to guard against and compensate for wear. Downward thrust is taken up by a ball tbrust bearing located at the top of the steering column. Wear in the gear itself is guarded against by the use of a hard bronze nut, instead of babbitt as before. The steering arm is carried well out to the frame, so that the connecting link does not interfere witb the mud pan.

For some time the Rambler company has been trying to obtain a rear spring for the four-cylinder models which would provide as great flexibility as any other type and retain the advantages of low center of gravity and absence of side sway peculiar to the semi-elliptic. Tbe desired qualities have been attained on the new models by springs known as "triple action." Besides the flexibility provided by the auxiliary coils, these springs are unusually long and have all tbe advantages of the semi-elliptic. Tbey have been thoroughly tested on a number of cars of the 1908 model.

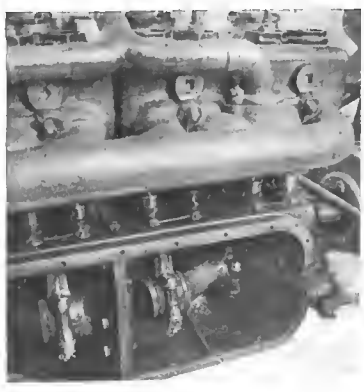
Features of the Two-Cylinder Car.—The Rambler two-cylinder models will consist of a five-passenger touring car and two or three-passenger runabouts, listing at from $1,150 to $1,350. Very little change has heen made from former models. The unit power plant, with the change-gear, clutch and flywheel enclosed, is continued in exactly the same form. The body is arranged to tilt upward to give access to all working parts in the motor and transmission. The main crankshaft bearing is of the self-centering type, and adjustment is accomplished by turning in a ring which draws the two halves together in a tapered box.

An unusual feature for a two-cylinder car is the floating type rear axle. The weight of the car is carried on heavy roller bearings, located on the axle tube, the driving shafts being relieved of all weight and serving simply to rotate the wheels. The aluminum rear axle housing formerly used has been replaced by a heavy forged yoke. The clearance of this car is unusually large. The lowest part of the mechanism is the rear sprocket, and as this is located to one side of the center, it clears obstructions which centrally located sprockets would encounter. In addition, the rear wheels are 34 inches in diameter, so that there is a distance of 15 1-4 inches from the ground to the axles. The tires are 34 x 4 inches and the wheelbase 106 inches.

Showing the New Plug Connectors.



Simplicity of the Rambler Clutch Adjustment.



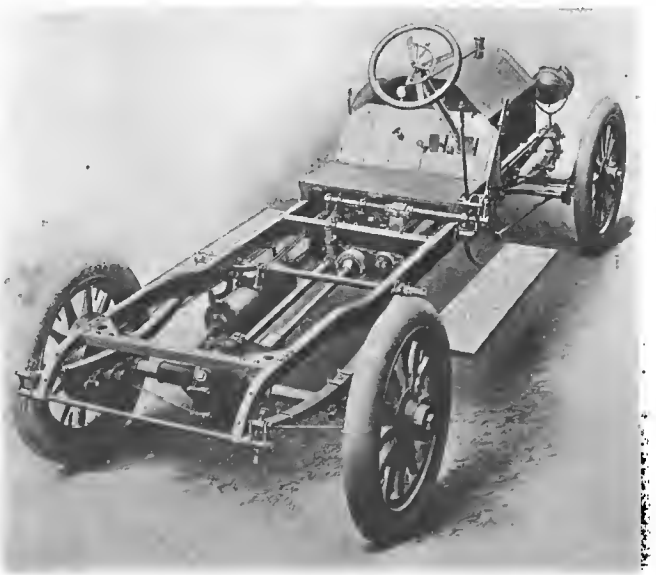
Rambler Main Bearing "Get-at-ability."

Locomobile Shaft-driven Model for 1909

By Charles B. Hayward

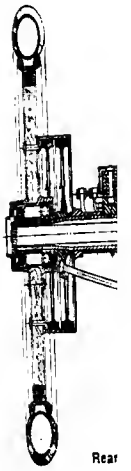
BRIDGEPORT, CONN., Oct. 26.—There will be a shaft driven Locomobile for the 1909 season, and, while this nouncement of the builders may come somewhat as a surprise dvocates of the chain drive, of which the Locomobile Com- has been a most consistent advocate since the earliest days, ill doubtless prove more of a surprise to learn that Mr. r and his staff have been working on the problem of the t drive for more than three years past. From the very et the upholder of the chain type has looked with con- rable suspicion upon any construction which must at once the load of the vehicle and also act as a driving medium, it has been with the idea in mind of entirely eliminating disadvantages arising from the latter that the Locomobile pany has centered its efforts for so long a period upon a t-driven model without making it public. In other words, object has been to evolve a shaft drive that could be re- ded as on a par with the side chain and the dead rear , where safety and reliability are concerned. This the gners of the Locomobile feel confident that they have eved in the new Model L, and a review of its specifications ere set forth goes far onfirm it.

Details of the Power nt.—As is naturally to expected, the motor is racterized by the nu- ous details of design construction that have n worked out by Mr. er and his staff on the comobile cars in the t seven or eight years, that there is an utter k of anything that ght be termed radical, for that matter any- ng that is really a de- ture from what has g since come to be ognized as standard ctice on this car. The inders are of the "T," outboard valve port e, cast in pairs, with ge openings in the ads of the water jack- that are covered with bronze plates. The cylinder castings receive three boring cuts, and are then ground. The cylinder dimensions are 4 1-2 inches square, and the power rating nominally employed to distinguish the car is obtained at a low normal speed and is very conservative, as the motor has shown close to 40 horsepower on long-continued tests, made on an electric dynameter, an installation of several of the latter being used entirely in testing the Locomobile motors in the regular course of manufacture. The valves are oppositely disposed, and are driven from independent camshafts, the inlet shaft also carrying the igniter cams. The latter are made with a tapering face, and the shaft itself is so mounted as to permit of its being shifted longitudinally to advance or retard the ignition timing. Both of the camshafts are made with the cams integral, and are one-piece drop-forgings turned out in the home plant, the Locomobile Company having long been noted for the completeness of its drop-forging equipment. This method is employed for the manufacture of every part to which the process lends itself, ranging from the smallest fittings up to the one-piece I-beam front axles. All drop forgings are subjected to treatment.



Rear Quartering View of Model L, Illustrating Its Shaft Drive.

As has been the case for a number of years past, manganese bronze is still retained as material for the crankcase, the supporting arms for the motor being cast integral. The oil-pan is of aluminum, as is also the housing for the timing gears, neither of these members being called upon to sustain any load. Throughout the construction of the motor the most advanced practice is followed to insure accuracy and interchangeability, the cylinder, pistons, rings, crankshaft and camshaft all being ground to micrometer gauge, while such pieces as the crankshaft are all specially heat-treated, the Locomobile plant having a particularly elaborate and complete heat-treating and



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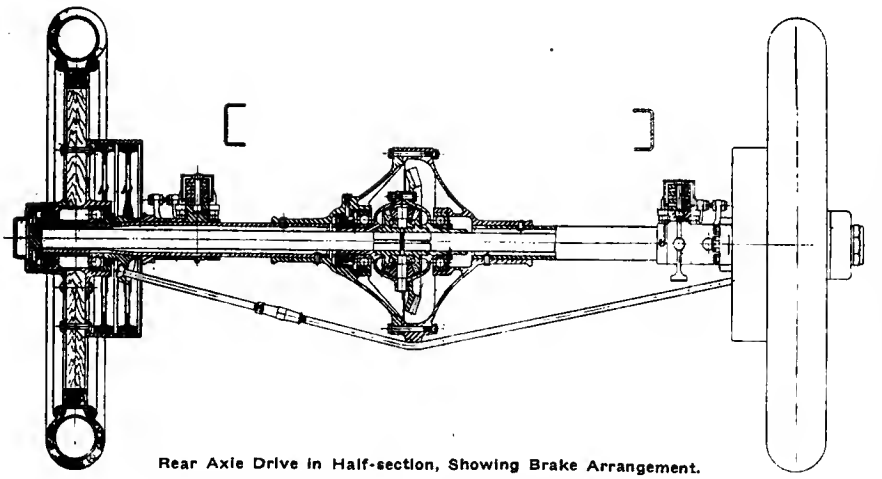


Rear Axle Drive in Half-section, Showing Brake Arrangement.

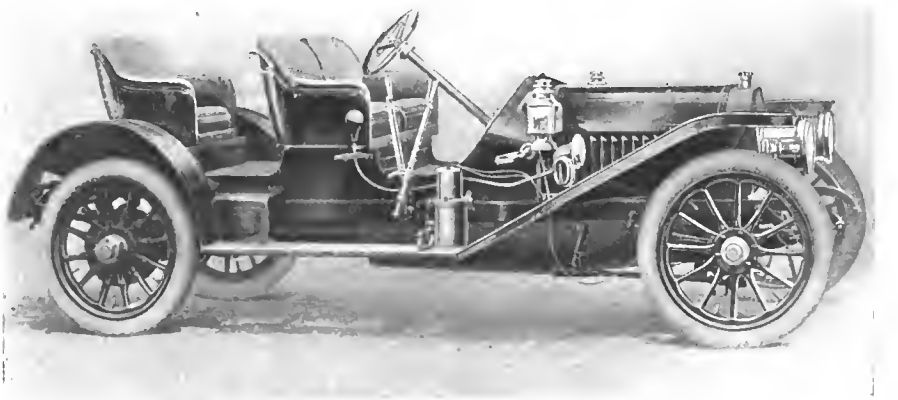
hardening department in connection with its drop-forging plant.

About the Motor's Accessories.—As has come to be recognized as the best standard practice in this respect, the oiling equipment of the motor has been made practically integral with the latter on the new Model "L." A mechanical force-feed oiler, having three direct leads to the main bearings, is situated at the rear of the motor, almost under the footboard, and is gear-driven from that end of the exhaust camshaft, the drive all being protected by an aluminum oil-tight housing. To facilitate the distribution of the oil, the crankshaft is drilled, while a hand pump on the dash is employed to suppplement the crank-case supply for splash lubrication whenever necessary. But one of the oil feeds is carried through a neat and very small sight glass on the dash, thus ridding the latter of what has long been regarded as an undesirable encumbrance.

The carbureter is of a special type that has been developed by the designers of the Locomobile during the past five or six years, and which for the coming season has undergone one or two changes. Chief among these is the adoption of water-jacketing, hot water being tapped from the top of the jacket of the rear twin-cylinder casting, and led between the latter and the forward pair to the carbureter jacket, the discharge from this being returned to the bottom of the radiator. Liberal sized copper tubing has been adopted for this purpose, and no flexible joints have been found necessary. Shut-off cocks are provided both on the intake and outlet to provide for regulation of the hot-water flow. Another entirely new feature of this carbureter is the conical tapered spring auxiliary air valve. This spring is carefully wound to a very closely predetermined tension, and is vertically placed directly above the throttle, which is of the piston type. An increase in suction above that normally taken care of by the main air inlet causes this spring to distend, thus permitting additional air to enter through the spaces between its coils. The piston throttle in question is controlled from one end by the usual hand lever on the steering wheel, while from the other it is regulated by a centrifugal governor incorporated in the exhaust camshaft-driven gear. This governor permits the motor to maintain any speed up to the point of throttle opening allowed for by the hand lever, while the accelerator pedal cuts out the governor entirely. The low-tension magneto of Mr. Riker's design, which has been a distinguishing feature of the Locomobile since 1905, is continued without any change whatever from the 1908 model, this also being the case where the igniter equipment is concerned, as this part of the car has been developed to a point which leaves nothing to be desired. A feature worthy of mention in this connection is the fact that the iridium steel contact points employed are now welded to their blocks, making them practically integral with the latter. Cooling is provided for by a centrifugal pump circulating the water through the honeycomb type of radiator that has long been a familiar Locomobile feature. This is supplemented by a belt-driven aluminum fan running on ball bearings, and for which an eccentric tightening adjustment is provided. Union connections are employed on the radiator, both top and bottom, and do away with the necessity of breaking hose connections when necessary to dismount any part of the cooling system. Both the throttle and spark control are effected through a screw and nut movement, instead of the bevel gears ordinarily employed, this making a considerable saving in space.

The starting crank spring, instead of being carried forward as formerly has been placed farther back, and is now completely housed in, giving this part a much neater appearance and protecting it from dirt.

Features of the Transmission.—The first step in the transmission of the power consists of the standard type of leather-faced cone-clutch, which, however, is so mounted as to be removable without altering the tension of its engaging spring, or, in fact, without disturbing any of its related parts. Flat springs are employed under the clutch leather, causing the clutch to engage smoothly and without jerk. No universal has been found necessary between the clutch and the gear-set, the latter being placed about in the same position in the car, as was the case when it was chain-driven. The gear-set is of the sliding type, providing four forward speeds, with but two, instead of the usual three, sliding members. Both shafts are mounted on imported annular ball bearings, and the entire gear shifting mechanism is enclosed in the same housing with the driving gears. The use of but two sliding members to effect the gear changes permits of the use of a much simpler sector. Direct drive is on the fourth speed. The housing of the gear-set is of



Attractive Lines of the "Thirty" Locomobile Roadster for the Coming Season.

manganese bronze, with an aluminum oil pan, following out the same construction as characterizes tbe crankcase.

Drop-forgings enter almost entirely into the makeup of the shaft drive, and are also a prominent feature of the differential and rear axle. The forward universal consists of two drop-forged yokes, the pins of which are bronze-bushed, while the latter are clamped with steel rings in order to permit of taking up any wear that may occur, although the experimental cars of this type that have been on the road for almost 10,000 miles show no signs of wear whatever in this essential. At the rear end of the shaft there is a combined universal and telescope joint, consisting of an extended drop-forged yoke in which a substantial pin is free to move longitudinally on rollers, the latter being hardened and ground, as is the case with all load-carrying parts. This yoke of the universal joint is in one piece, with the shaft carrying the driving bevel, and is supported on an annular ball bearing besides carrying a special thrust bearing of the ball type, which is placed directly behind the universal. There are several features of interest in connection with the use of the annular ball bearings on the Locomobile, a great deal of care having been taken to mount them exactly in accordance with the maker's specifications. For instance, the races of the forward bearings in the gear-set are rigidly held, while the after one is allowed to float, thus permitting the bearing to center itself accurately. This is also true of the ball bearings used on the driving shaft of the live axle. All are of unusually large sizes for the loads to be carried, providing a very high factor of safety where these important essentials are concerned. A ball thrust bearing is placed on each side of the differential and annular ball bearings are used for carrying the rear wheels. The driving shafts are one-piece drop-forgings, and are made integral, with heavy flanges on their outer ends from which the wbeel-driving clutches are milled, the specifications of the latter calling for their engagement with the corresponding member on the driving wheel to .0001 inch. The standard gear ratio is 3.24 to 1.

Brakes of the "Thirty" Locomobile.

Doubtless the most interesting feature of the construction of the rear axle is to be found in the fact that the housing of the driving shafts is designed merely to carry the dead load of the car and its passengers, and is not subjected to either braking or torsional strains, this being a feature that has come in for all too little attention on a great many American shaft-driven cars. The axle tubes are seated into the central housing by hydraulic pressure, and are then riveted in place. They are braced by means of a substantial strut rod made with a ball seat head forged integral with the rod. The same drop-forged distance rods that have always characterized the chain-driven car are employed, and are designed to take the entire braking strain, the springs being revoluhly mounted on the axle tubes and shackled at both ends. In the design of the axle tubes particular care has been taken to eliminate all shoulders, changes in diameter being made by gradual taper.

The brakes measure 14 incbes in diameter by 1 1-2-inch face, and, instead of being mounted concentrically, are placed side by side in a large drum housed in by a plate carried on the distance rod. Small yoke equalizers are employed on both the emergency and running brakes, thus dispensing with cables. The brakes are cam-operated, the shafts being concentric, and are lubricated by a compression grease cup, as is the case with every other moving part of the car outside of the motor and gear-set, no less than 28 of these cups being provided on such parts as the spring shackles, steering knuckles and the like. Further evidences of the painstaking care used to provide proper lubrication is to be found in the fact that the spring leaves are all graphited before assembling. The rear springs measure 48 inches by 1 3-4 inches, while the forward ones are 36 inches long, of the same width. In drop-forging the saddles for the former, an extension has been placed on them to provide a lifting point for the jack—an addition that has been found very convenient. The steering gear is of the worm type, a full worm wheel being employed instead of a sector, thus providing a means of taking up wear by bringing an entirely new gear face into contact. The front wheels are carried on Tinken roller bearings; the wheel base is 120 inches and the tread 54 inches, tire equipment consisting of 34 by 4-inch front and 34 by 4 1-2-inch rear, the make being optional. The new model will be listed at $3,500.

THE IMPORTANCE OF HAVING GOOD BRAKES

By ARTHUR H. DENISON.

It is never worth while going out with a car unless the brakes can be depended on. Accidents are costly, as well as dangerour to life and limb. When the car is not equipped with an equalizing device that will insure equal braking effort on both wheels, the best method of equalizing the brakes is to jack up both rear wheels together and adjust the brakes by hand as near alike as possible. Then have someone apply the pedals similar to running conditions and try to turn the wheels separately by hand. If the brakes are not adjusted alike it is easy to adjust either so that the braking effort is uniform. Also see that the brakes do not drag and waste power. Some brakes are intended to be lubricated, others are useless if oil gets on the friction surfaces. When this happens the best thing to do is to squirt a little gasoline on the drum. This will cut the oil and restore the efficiency. If one brake is adjusted tighter than the other it will throw the end of the car on tbat side around. Brakes should never be applied too bard. If the wheels are locked, much of the retarding effort is lost and much rubber is ground off the tires, or if traveling on muddy roads or pavements all control over the car will be lost. Friction surfaces of metal to metal, or steel to camel's hair or asbestos, will give little trouble with ordinary care. If leather is used, its life will be prolonged by releasing the brakes for an instant while in use. This will allow a current of air to pass between the surfaces and carry away a great deal of the heat generated. The friction of the brake leather on the drum always generates heat, and the leather may be heated enough to be burnt or charred until useless.

On long grades the brakes should not be depended on to hold the car. The ignition should be cut out, and, depending on the length and steepness of the grade, a suitable gear should be meshed and the car allowed to coast under compression, the brakes supplying any further retarding effort necessary. The writer, handling a 50-horsepower car that loaded weighed over 5,000 lbs., has brought the car to almost a complete stop from a speed of about 15 miles per hour on a 20 per cent. grade, by dropping the clutch in with the engine dead, first speed in mesh, and the energy required to bring the motor to the speed of the car was enougb to bring it to almost a dead stop. This is a greater retarding effort than could be obtained by the use of brakes. Motorists driving in a hilly country should *never* have the emergency brake lever *interconnected* with the clutch, as this prevents the use of a very efficient brake.

The Foreign Automobile Tour from a WOMAN'S Point of View

By BLANCHE McMANUS

[ERE are many women, and men, too, who visit Paris, take a turn or two in the Bois, a few rides out over the execrable rban *pavé* to Versailles, Saint Germain, and Fontainebleu, that is all. These suburban Paris sights many people think must enjoy and take in because they are classic, and because have been told that the roads leading thereto are the over which royalties one day rolled in bone-shaking state ies, and did not mind in the least because they never even cioned the advent of the automobile. The horseless carriage nds something more than Louis Quatorze *pavé* in order to l in comfort. It is these folk who do their automobiling id Paris who go home and tell of the "lovely time" they had ing in France." Some may even get so far away from apital as to spend three or four days in what has come familiarly known as "the châuteau country," dividing their between the big botels of Orleans, Tours and Nantes, and how châteaux.

e instinctively puts France first where automobile touring icerned, for where one woman is seen on the road in other ries there are hundreds in the land of good cooks. The l of show places and big hotels is enjoyable enough in e, at least more so than elsewhere, but the open road s for much more. It means the long run across country g some little country hotel early in the morning, so early, imes, that even the *garcon d'ecurie* is not yet about, and s obliged to open the *grande porte* of the courtyard one's order to get out into the open. This presumes, of course, ne has taken the precaution to pay his reckoning the even- fore, and, being in a considerate mood for the feelings of people, takes care also to push his automobile into the and start it there rather than fill the small courtyard with and noise and the ire of the sleepy inmates of the house. these little courtesies that smooth the way of the auto- st, but not everyone thinks of them at the right time, of all, milady, who, for a fact, often thinks she is doing ody about the place a favor by condescending to have in such a humble establishment, where she has to retire light of a candle, as she most likely will have done if she ly touring and not flying willy nilly, humming-bird fashion, one electric lighted resort to another.

knobbly *pavé* of the village is soon over and your auto- swishes along the smooth white road between dewy fields the industrious peasant—invariably an early riser in —is already at work. The sole occupants of the road time, other than yourself, are great farm horses with lumsy carts and drowsy drivers, and they, too frequently— nce as elsewhere, alas!—on the wrong side of the road. should cultivate the habit of the early start, perhaps the rying of all automobile habits for womankind. One soon learns the wisdom of it, however. If you are going to have trouble with your machine en route, it will come early in the day, and then you will have some chance of getting over it before night.

Breakfast in bed—even a continental breakfast—followed by a dawdling toilette often finds you at night with a lame and limping automobile, and you, like the foolish virgins, may be forced to remain without the gates with no oil in your lamps. An hour or so of this early morning run and then comes the stop at some little wayside café for an unconventional breakfast of a cup of coffee and a roll, and as you drink it in a little vine-covered arbor, or on some hillside terrace, you will not regret the lost breakfast in bed, with the almost invariably bad hotel *café-au-lait—a rechauffée,* simply of the coffee of the night before.

Many tour thousands of European kilometers without maps, without once slackening speed at any of the excellent and obvious road signs scattered up and down the continent, and are proud of it. Their unhandy method is to harry the good-natured natives along the road, but then one only gets dubious information at best, for the native himself usually doesn't own an automobile and his own radius of action is always very limited, and his knowledge of roads and routes likewise. A conductor of an automobile such as this eventually loses his temper and everybody suffers.

Ideal Foreign Tour Not a Dress Parade.

The ideal tour isn't a dress parade, and it should not be made to include the resorts of the big hotels whose *salons* are the showrooms of the *couturiers* and *modistes* of Paris, London and New York. If the glamour of the grand hotel tour is too strong to be resisted, why go in a big limousine, top-heavy with luggage, trunks and hat boxes, if you will, but be consistent, at least, and don't try to mix vagabondage and super-luxurious travel. The woman who is always talking about how she "loves those quaint little country places where one doesn't have to dress, you know," has invariably excellent reasons as to why she is never found at any of them, and has her name cabled frequently to her home paper as having arrived at the Grand Hotel this or that at Trouville, Aix-les-Bains, Cadennabia or Biarritz. If by any chance one of these flighty, unknowing persons is ever induced to sample the delights of the simple country inn, her chagrin and weariness are painful to observe.

It is not necessary for a woman to always have by her a trunk filled with what she sometimes calls Monte Carlo clothes in the hope that she will be able to induce her husband to pass that way. It may be well to remark right here tbat no Mediterranean Winter resort has a climate which warrants the wearing of indiscriminately thin dresses.

The modest suit case will not debar one from the enjoyment of Europe's great pleasure resorts. It is just as easy to enter the *Salles des Jeux* at Monte Carlo, and amuse one's self in losing or winning a few or many five franc pieces, or "louis" for that matter, and one may lunch at Ciro's as much at ease in the simplest traveling dress as in the latest Parisian confection, though, perhaps indeed they will not be so conspicuous. It is true that on entering the Casino at Monte Carlo the woman automobilist, who is still shrouded in a veil, will be asked to take it off before entering the *salles*—this for some occult reason known only to the administration.

You may even rub shoulders with Kings Edward and Alphonse at Biarritz in the same democratic garb in which you do your automobiling, as you "five o'clock" on the hotel terrace. They will, most likely, be dressed in the same sensible fashion.

If one should foolishly lumber up their automobile with much baggage, not many, even with the best intentions in the world, will bave enough energy left to make any radical change in their dress when finally they reach the night's stopping place.

On this basis one's preparations soon dwindle down to a change of stock, a hasty brushing off of dust, and a generous

polishing of hands and face so that when the big bell in the courtyard sounds for dinner, one descends to the *salle à manger* much too healthily fatigued and hungry to even care to explain why she hasn't "dressed for dinner."

Don't Be a Fault-Finder; It Doesn't Pay.

It will avail nothing to bolt into the English country inn, French hotel, or Italian albergo and adopt an air of criticism the first thing, as if you were about to plan the reconstruction of the establishment according to your own preconceived ideas. One only gets disliked for this and accomplishes nothing except to upset the ménage and add to discomforts already existing.

Don't try to have a course dinner served to you all at once, because you can't eat meat without vegetables, nor demand *café-au-lait* with the same repast unless you are prepared to astonish the natives and pay, say, a franc and a quarter extra for each person. All these things only bewilder the *garçon*, excite the *chef*, and spoil what would otherwise have been a good dinner.

What is the use of calling the *bonne* to account if there is a bit of fluff on your bedroom floor so long as the beds are clean and good, as will most always be found to be the case even in the most modest of European hotels.

Make up your mind before leaving home to do without bathtubs. In England the exaggerated flat tin dish that answers to the same name as our best porcelain in America is no better suited to its purpose than the more limited accommodation one usually finds in France and Germany and Italy. The dust of the roads comes off no better in one than the other. The only way to get it off is to lie down and soak it off, and there are very few opportunities for that in Europe outside of the great capitals and the frankly avowed resorts with a stranger clientèle.

The substitute is the jugs of water, which, on account of their diminutive size, are brought by many journeys of the willing *bonne* or *madchen*, or, in France, as is most frequently the case, the service will be performed by a *garçon*—a man in other words, though do not let this shock your womanly sensibilities. It is the *garçon*, a man of all work about the house, that in France, more often than not, performs the functions in the small hotel in the small town which are usually delegated to a *femme de chambre* elsewhere.

Hunting for Hotels with Bathtubs.

There is a largely increasing class of travelers wandering up and down Europe, who spend a good part of their time on a still hunt for hotels with bathtubs and "hot and cold water laid on," as the English have it. This brings dismay to the ordinary European hotel-keeper, to whom a single *salle de bain*, accompanying a score or two of sleeping rooms, is already considered as the acme of an unnecessary and luxurious appointment, and one on which he is loth to spend more money to provide a further installation. Therefore, the private bath is practically non-existant off the beaten tracks, and the common public affair, even, is a great rarity.

The wail of these good travelers who would demand a bathroom for their own use if they were in darkest Africa goes up continually in a loudly increasing scale from London to Cairo and from Paris to Rome. It forms one of the principal topics of conversation, where women tourists mostly congregate; this, regardless of the fact that with many must still linger the remembrance of the good old-fashioned Saturday night scrub which they took in the family wash-tub before the kitchen fire. Porcelain tubs and hot and cold water led up thereto in nickeled piping didn't arrive with us at the same moment that the Mayflower set down its array of ancestors on Plymouth Rock.

When Women Are in the Party.

The very fact that an automobile touring party counts women among its members is often an excuse for the European hotel patron to press upon his guests the use of small tables in the dining room (at fifty centimes or a franc extra for the repast and *vin non compris*) or an even *salle particulière*, as being more exclusive than the ordinary table d'hôte, and, therefore, what you are looking for. You are probably not looking for this sort of thing at all, but he thinks you are. Why the automobilist should be put into a class by himself is not quite clear, and should be discouraged by the woman automobilist who is largely responsible for this invidious distinction. It's more expensive and less amusing from every viewpoint.

The day when automobiling can properly be considered a society function or the *jeu* of millionaires and heiresses has happily passed, so don't hesitate to take your seat at table d'hôte, for the dinner is just the same as would be served at small tables and the price less. The establishment could not vary its menu in many cases if it would, save to add a tough *bifteck* or an *omelette au jambon* always given *"les étrangers"* if they will stand for it, even if you are, as will often happen in the country town, the only woman present. At the long table in the center of the *salle à manger* you will not be annoyed by unduly inquisitive stares or comments on the part of the other diners, not half so much as will be your fate if you sit apart. The provincial European, the Frenchman in particular, especially when occupied with his dinner, preserves an almost Oriental oblivion to the presence or even existence of woman.

It may be that in your tour across France en automobile, when you have reached the little town where you have elected to pass the night, it happens to be the eve of market day, and as you drive noisely into the courtyard of the principal hotel you find it crowded with farmers' carts and wagons of all ranks of distinction and size. What difference ought it make to you if you are put to sleep in the only vacant rooms which remain, those running along one side of the courtyard over the stable, and to which you mount by an outside stairway and an open air gallery? It's all in one's book of experience, and so long as the rooms are clean and the dinner good (which you will eat in company with the prosperous neighboring country folk there assembled) you will be better content when it is all over than you most likely would have been had you kept on to some big town and been served imitation Parisian fare.

Another Leaf in Experience's Book.

The next night, perhaps (and here's another leaf in the book of experience which you will reread with pleasure at some future time) you will find yourself housed in some aristocratic old hostelry which claims the local noblesse for its clientèle, as it did in the old posting days of Le Grand Monarque. Here you may sleep in a princely bed of inlaid woods, draped with silken hangings. This thing may happen on anybody's "little tour in France," and they, and others, not far different, are what make the charm of French travel. One of the greatest of these is the thing that one falls upon unexpectedly, a quaint inn, a remarkably good dinner, or a bit of local color that looks as though it might be a part of a costume novel.

The automobile tour demands that one and all who make the party should preserve their equanimity; the troubles of the road only serve to accentuate one's pleasurable experiences, and, after all, those are the things which will be most deeply etched on one's consciousness. Troubles are more readily forgotten than pleasures. Women are too prone to think that their way is only smoother for them by the lavish expenditure of money on the part of their male relatives. Something besides money talks, fortunately, when touring in France.

Little politenesses count for much among the older nations, often for quite as much as the indiscriminate throwing around of coin, though it may be difficult to convince some of this. The average person abroad who caters for travelers is not nearly so grasping, if approached in the right way, as is commonly supposed. So scatter a few smiles and appreciative words along with your louis, francs and sous.

Always shake hands with the French country hotel landlord on leaving if you have stayed longer than a single meal (never this thing in England; they would have a very poor opinion of you if you did it). Nothing pleases the patron of the small French hotel so much as this little attention—and you leave behind the verdict, *"Les dames Americaines sont toujours gentilles."*

VANGUARD OF GRAND PRIZE DRIVERS DUE THIS WEEK

WITH the Vanderbilt race over, the scene of 1908's great Autumn road racing campaign shifts to Savannah, where on Thanksgiving Day will be run the international Grand Prize contest for the Automobile Club of America's gold cup, with a light car race the day before by way of a curtain raiser.

The first of the foreign drivers arrived Tuesday, they being Cagno and Piacenza, of the Itala team. Fournier, the other member of the trio, will not reach here probably until next week. Nazzaro and Wagner, of the Fiat team, are on the *Lorraine*, due on Saturday, on which Hautvest and Rigal, of the Clement-Bayard, and Duray, of the De Dietrich, are also reported to have sailed. Szisz, the Renault pilot, will sail this Saturday on the *Touraine*.

The entry list for the light car race is growing rapidly and on Tuesday had reached 21. Two more Buicks have been nominated, raising that factory's string of candidates to four. Late entries include three Oldsmobiles. Their nomination by the Olds Motor Works is noteworthy in that it marks a re-entry of Oldsmobile cars into the racing game. Besides this, this race will be the first competitive, and, in fact, public demonstration of the new $1,200 cars this company is to put on the market. They will have 3 3-4-inch cylinders. It is expected that William Folberth will be the pilot of one of them.

Entries for the Grand Prize and light car races will close finally next Monday. The headquarters of the club's contest committee will be transferred to Savannah, October 15, when Chairman Morrell will take up the preliminary local preparations for the races. N. H. Van Sicklen, of Chicago, who was prominent in the management of the March races, will go to Savannah next week to again assist the local clubmen.

QUAKERITES HAVE GASOLINE-ELECTRIC STOP-WORK TEST

PHILADELPHIA, Oct. 26.—Thursday afternoon last there was quite a little flurry of excitement all along "Gasoline Row" over an impromptu contest between an electric and a gasoline —both of the Studebaker brand—which was pulled off to decide a heated discussion as to the relative merits of the two powers in short-stop work in big cities.

It was agreed to make up a list of 25 calls, with instructions to each driver to make one-minute stops at each place, and shutting off and starting up the power at each stop; one driver to begin at the top of the list and the other at the bottom. The electric bunch, just to prove that they had no fear as to the outcome, put a lady, Miss Laura Duval, up as driver, while the big seven-passenger gasoline car was handled by Tom Middleton. The latter was off like a flash when the word was given at 2 o'clock sharp, while Miss Duval proceeded more leisurely down Broad street on her mission. There was a wait of a few minutes over an hour when the electric was sighted homeward bound. Miss Duval drew up at the curb at exactly 3.10, while it was a trifle over ten minutes later when Middleton brought the big gasoline to a stop. "Tom" was hot and flustered-looking after "cranking up" 25 times, while Miss Duval finished as cool-looking as a ripe peach in a refrigerator.

Besides the time gained in starting, Miss Duval said she had lost little time in threading the maze of traffic on Chestnut street, her little car enabling her to worm in and out and around standing carriages, wagons, and trolley cars, while the big car was often held up until an opening was made by the starting of the car, wagon, or other obstacle. And yet, despite the "I-told-you-so's" of the electric enthusiasts, the gasoline didn't seem to be convinced.

MARYLAND'S AUTO MEASURE READY FOR LEGISLATORS

BALTIMORE, Oct. 24.—A bill to be presented to the next Legislature has been framed by the automobile commission of this State which will bring in $75,000 a year for use in creating and maintaining good roads, in addition to the $5,000,000 loan which was passed by the last General Assembly. The plan of the commission is to tax cars according to horsepower, the rate being from $10 to $25. Two thousand high-grade cars paying the maximum of $25 a year would make $50,000.

There are altogether 5,500 cars throughout Maryland and the commission says the amount realized in taxes on the remaining cars would make up the other $25,000. This amount would be used in opening up and maintaining improved highways, and this plan, the commission figures, would encourage more people to buy autos, with the result that the number of machines would be vastly increased. The present auto tax is $3 and is perpetual. The commission will recommend in its bill a liberal but not reckless speed law, and will also insist upon chauffeurs being licensed.

DISCRIMINATES AGAINST SMALL CAR OWNER.

BOSTON, Oct. 26.—The Metropolitan Park Commission, which controls most of the parkway approaches into Boston, and which last spring barred from its roads all sorts of tire chains, studs, burrs, and other metallic anti-skidding devices, has announced a change of the rule to go into effect on November 3. There were loud protests from autoists when the rule was put into effect, and as a result the commission watched very carefully its operation. As a result it has decided that after November 3 armored tires will not be prohibited, but that the rule against tire chains shall be enforced and also that the use of ropes of metal or other material on the wheels shall be under the ban. It is not admitted that armored tires do not wear the roads, but that they wear less than chains or ropes.

BALTIMORE WILL HAVE A HILL CLIMB.

BALTIMORE, MD., Oct. 24.—The Automobile Club of Maryland, through its committee on contests and exhibitions, has formulated plans for a hill climb in compliance with A. A. A. rules. The time set for the contest will be either on or within a few days of Thanksgiving Day. Dr. H. M. Rowe, president of the club, has offered a president's cup and Thomas G. Young has also donated a trophy to be given to the winner.

FORT GEORGE HILL CLIMB AGAIN POSTPONED.

Another postponement of the Fort George hill climb, scheduled for Election Day, has taken place. It was found that the competing cars would pass a polling station and possibly interfere with the rights of the voters.

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AMERICAN CAR AND AMERICAN DRIVER.

Differences of opinion may have existed as to the worth of the rules to the industry itself, not a few of the cars engaged may have been two-year-olds and constructed for speed solely, and the field may not have classed as high internationally as those of previous races, but the fact stands out clear and distinct that an American car, made entirely of American materials, and driven by an American, convincingly won the fourth contest for the Vanderbilt Cup, a trophy that now stands by itself in the estimation of automobile owners and makers.

All comes to him who waits—and works while he waits, so that he may be prepared for that which he waits when it arrives. This applies to the company which produces the Locomobile, for it built two superb racing crafts for the 1906 Cup race. One of these was used, and made the fastest lap of the day, but an insufficient practice period failed to disclose minor defects that betrayed themselves in the race itself.

Nevertheless, the designer, and others who had opportunity of obtaining exact knowledge, believed that the two cars were equal in speed to any ever built here or abroad. Naturally, the maker wanted further to utilize the results of his skill. Unfortunately, there was no race in 1907, owing to inability to secure a properly guarded course. (How can we obtain one in the vicinity of the metropolis, unless an iron fence, spike-topped, be stretched around it?) It is now an admitted fact that the 1908 rules, at variance with the international regulations, proved detrimental in assembling a more international entry. At the same time, though the French Grand Prix cars had lesser bore, their makers had retained as much horsepower as before by the simple expedient of lengthening the stroke, for there was no maximum weight restriction.

If the big club in New York City had not in the struggle for the retention of its "foreign relations" forced the European clubs to observe scrupulously the Ostend agreement, it is a certainty that the bore difference would not have kept the Grand Prix cars out of this year's Vanderbilt. However, that is an old story, the sequel of which is scheduled for Savannah on Thanksgiving Day.

Hence again to the Vanderbilt. The American winner met three Germans and two French cars of unlimited bore and stroke, and trounced them aplenty. And right here it should be said that the single Italian participant, with its lesser bore and stroke, made a consistent showing for which it should receive a goodly amount of credit, though it should be mentioned in the same breath that an American driver was at its wheel.

The intractable American crowd surging upon the course as soon as the American-Italian duel had terminated, prevented other cars from finishing, though it is good figuring that No. 1 Locomobile was entitled to third place in front of a Mercedes, behind which another American, a Thomas, was progressing homeward.

In the showing of the Chadwick six-cylinder there is something more in which America can take additional pride, for it led three laps and lost its grip of the situation, not owing to troubles of its stock engine, but because of ignition difficulties. Its engine meets international conditions, and 'tis said may participate at Savannah, with the Grand Prix invaders.

It has been one of the faults of American makers to delay preparations for racing until the eleventh hour, and then expect to hold their own with the creations of European manufacturers who have carefully planned a year ahead and left undone nothing which might seem to insure success. It is pretty good guessing, however, that this time the Locomobile candidates were ready and waiting for the starter's gun, even though there was some uncertainty as to the men who might be placed at the steering wheel. And therein lies another reason why we in America have been sadly at a disadvantage in high-speed competition. Our drivers have not had sufficient opportunity to try out their cars in such manner as their French and Italian rivals, who have miles of practically untenanted roads where speed is reasonably interpreted.

The building of the Long Island Motor Parkway unquestionably will greatly aid in lessening this handicap in the future, for certainly it will provide a place for trying out a car to its full capacity.

All in all, the 1908 Vanderbilt race, despite its deficiencies, is an event calling for American enthusiasm and American confidence in future international competition, the life of which may not be very extended in automobiling, owing to the inevitable growing unproductiveness of the American market for the foreign makers, who will not race here when they cannot sell here.

About the Winning Car and Its Driver

TEREST naturally attaches to the mechanical details of the winning car, for in these days of strenuous competition, :n the loss of but a minute or two means dropping back into :c, instead of achieving the covcted first, the specifications of design and construction that withstood the gruelling test iout a falter and came through with flying colors are matters import. Robertson's Locomobile, which ran as No. 16, and rida's No. 1 Locomobilc are the twin cars designed and t especially for the Vanderbilt Cup race of 1906, and with exception of a few minor changes, such as the substitution a selectively operated gear-set in place of the progressive type merly employed, they have not been altered.

n the light of the present tendency to limit motor dimen-is, the Locomobile's cylinder dimensions of 7 1-4-inch stroke 6-inch bore appears very large, but the object under the 's formcrly prevailing was to construct a motor of the ximum size, consistent with the minimum weight limit of o kilos. The cylinders are cast in pairs with the water-:ets integral, but the latter are largely cut away, the open-; being covered with light plates, to save weight. The inlet :e is placed in the head and the exhaust on the side, both g operated from the same camshaft.

or ignition, a special low-tension magneto, made from speci-ions by Mr. Riker, the designer of the car, is relied upon :ely, the ignitors being exactly the same as the stock Loco-iles, as, in fact, is the case with many of the other features he car. The clutch is of the conical type with the usual ier face and is held in place by six dowels when home. remainder of the transmission is composed of a three-speed tively operated transmission and double chain drive. Both : and rear axles are one-piece drop forgings of the I-beam The wheelbase is 110 inches.

Interesting Racing Career of the Pilot.

orge Robertson, the winner, is a New York boy. In build a giant. In age he is not so very far into his "twenties." first introduction to automobiles came through association isiness with his father, who, in the days when the short on Thirty-eighth street between Broadway and Seventh ie was New York's "automobile row," established there Automobile Exchange." He early acquired a reputation as d and rather reckless driver. When he took to racing he romptly included among the ranks of the daredevils.

well earned the soubriquet when he was entrusted with ilotage of the first Apperson Jackrabbit when it was en-for the Vanderbilt Cup race of 1906. His preliminary :e for the elimination trials of that year was a series of ional drives that got him wide publicity in the newspapers nally landed him against a telegraph pole with an utterly ed machine that robbed the Appersons of their chance for anderbilt Cup of that year or even a place on the Ameri-am. His first long distance race was in the second s Park 24-hour race of last autumn, in which he alter-nated with "Al." Poole in driving the Simplex. His mount finished seventh with a score of 696 miles. In April of this year came his first road race, the Briarcliff. In this he had the mount on Andre Massenat's Panhard. Though his car was still running at the finish, it had completed but six laps and was sixteenth in line.

The Jamaica straightaway trials this Spring found him at the wheel of the Fiat, but the sprinting honor of the day went to Kilpatrick and the Hotchkiss. Again in the Lowell road race on Labor Day he was entrusted with the driving of a Fiat, which finished fourth to the Isotta, Locomotive, and Knox.

In the first of this year's Brighton Beach 24-hour races, Robertson shifted again to the Simplex, and, alternating at the wheel with Lescault, finished fifth, after having led in record time during the third, fourth, fifth, and sixth hours.

This ended Robertson's apprenticeship of wholesome defeats, which had taught him conservatism and caution and that the race is not always to the swift. His victory in the Simplex in the second Brighton Beach race in track record time, and his triumph in the Founders' Week 200-mile race at Philadelphia, both of which occurred this month, are recent history and formed brilliant tryouts for his final winning of the classic Vanderbilt.

Robertson's stop on the last lap had much of the sensational about it. It happened at a series of sharp turns near Bethpage concealed by woods, where the only warning was the noise of the racer. The Locomobile swung around one of these turns at top speed, skidded and turned completely around, ripping off the tire. Robertson won the admiration of the crowd by his coolness in the emergency. He took but 2 min. 10 sec. to put on a new one.

Trade Camps on the Course.—There were several noteworthy trade camps along the course. The Maxwell-Briscoe Motor Car Company and the White Company, with Benjamin Briscoe and George W. Bennett playing the part of head hosts, had big parking spaces, where they hospitably entertained the users of their cars. Mr. Briscoe also made the occasion a veritable reunion of Maxwell agents. The camp was in telephonic communication with the grandstand, so that all hands were informed of the progress of the race. The White people paid particular attention to the entertainment of newspaper men. In fact, that brought over from Philadelphia the "Shock Absorbers," an organization of automobile journalists, and kept them over night in its tent.

The Matheson Automobile Company, the American Locomobile Company, and the Peerless Motor Car Company were among the other prominent makers to establish parking spaces along the course.

Isaac H. Cocks established a parking space as a charity enterprise and netted thereby $450 for the Children's Home at Mineola. Scores of farmers reaped a harvest by turning their fields into parking spaces and renting privileges from $5 to $10.

Things in General about the Race

A. A. A. Notables Much in Evidence.—From various parts of the country came directors and officers of the A. A. A., the Racing Board of which practically supplies the Vanderbilt Cup Commission. The list of those present included the following: Robert P. Hooper, president Pennsylvania Motor Federation; Powell Evans, president Automobile Club of Philadelphia; P. D. Folwell, president, and Richard Sellers, Quaker City Motor Club; Edward Kneeland, president Automobile Club of Pittsburg; F. A. Godcharles, Automobile Club of Central Pennsylvania; Oliver A. Quayle, president, and C. D. Hakes, secretary, New York State Automobile Association; F. B. Hower, president Automobile Club of Buffalo; W. L. Brown, ex-president, and Burns L. Smith, Automobile Club of Syracuse; George B. Baird, president Oneonta (N. Y.) Automobile Club; W. W. Brown, president, and Col. W. D. Woolson, Automobile Club of Vermont; Lewis R. Speare, first vice-president A. A. A., Boston; J. P. Coghlin, president Worcester Automobile Club; W. H. Chase, Wachusett Automobile Club, Fitchburg, Mass.; G. H. Gillette, vice-president Automobile Club of Hartford; H. D. Holbrook, president, and G. E. Cole, treasurer, Litchfield County Automobile Club, Torrington, Conn.; Ira M. Cobe, president Chicago Automobile Club; George G. Greenburg, secretary Chicago Motor Club; James T. Drought, secretary Wisconsin State Automobile Association; LeRoy Mark, secretary Automobile Club of Washington, D. C.; W. C. Crosby, president, and H. A. Bonnell, secretary, Associated Automobile Clubs of New Jersey; J. H. Edwards, ex-president Automobile Club of Hudson County, N. J.; F. B. Moore, Automobile Club of Mercer County, Trenton, N. J., and a host of other club members.

Difficulties of Guarding a Metropolitan Cup Course.—A New York crowd has no reverence for a mere show of authority, as was evidenced by the actions of the horde in the vicinity of the grandstand. Here the eager seekers for free vantage spots easily and without ceremony scaled the much touted wire barrier that was to afford a protected track. Not backed up by an army of guards, this fence might as well not have been there for all the barring it did of intruders on the course. The Pinkertons, deputies, and the Irish Brigade soldiers apparently were utterly insufficient in number or incapable for the purpose. The guardsmen that had volunteered to furnish the military feature of the track's protection paid more attention to cheering the racers and keeping their score cards straight than to the serious task they had undertaken. They were hardly a bit more efficient than were the soldier boys with their little sticks that afforded such humorous policing at the Briarcliff race. If it be impossible to secure State military co-operation in policing future Vanderbilt races, then it would seem necessary to erect a high, stout, barbed-wooden fence along the home-stretch, well guarded from invaders at either end, and leave

Industry Well Represented.—The automobile industry was well represented in the throng that saw the race. Among those to be seen were: E. R. Thomas and H. S. Houpt, of the E. R. Thomas Motor Company; S. T. Davis, Jr., A. L. Riker, J. C. Kingman, and J. T. Plummer, of the Locomobile Company of America; Paul LaCroix, of the Reuault Frères branch; Henry P. Joy, Russell Alger, and M. J. Budlong, of the Packard Motor Car Company; S. A. Miles, general manager of the N. A. A. M.; Alfred P. Reeves, general manager of the A. M. C. M. A.; E. P. Chalfant, assistant manager, and Coker F. Clarkson, of the A. L. A. M.; A. C. Newby, of the National Motor Vehicle Company, Indianapolis; John N. Willys, Overland Automobile Company, Indianapolis; R. M. Owen, New York City; Col. George Pope, Hartford; J. R. Maxwell and Benjamin Briscoe, of the Maxwell-Briscoe Motor Company; C. W. Matheson, of the Matheson Motor Car Company; Henry Ford and Gaston Plantiff, of the Ford Motor Company; R. D. Garden, New York Pierce manager; C. A. Singer, of Palmer & Singer; E. H. Brandt, Cadillac Motor Car Company; John Rainier, New York City; Joseph Gilbert, Continental tires; Windsor T. White, Cleveland; A. M. Robbins, Chicago; George Johns, A. H. Whiting, and a long list of others.

Auto Clubs Had Delegations.—Several of the largest A. A. A. clubs had special parties to the race. Nearly a hundred from the Automobile Club of Buffalo, with D. H. Lewis in charge, had a special sleeper from Buffalo, and it was sidetracked near the grandstand. Another carload came from the Automobile Club of Germantown, and this car was also tracked in the vicinity of the grandstand. The Automobile Club of Hartford had a run to the cup course, participated in by over two score of cars, and the party included Governor Woodruff, of Connecticut. Two large tents were erected for sleeping quarters at the club's parking place a short distance below the grandstand. The fact that a Nutmeg State car won the race could not fail to be a source of great satisfaction to the Connecticut contingent. The Long Island Automobile Club had a big parking space, near the grandstand, and it included a tent wherein refreshments were available to members and friends.

Building of Motor Parkway to Be Resumed Next Spring.—"The Parkway," said A. R. Pardington, "is a tremendous piece of work. It is wonderful to think that it was rushed through in only two years. They were two years of the hardest work of my life. Here we have nine miles fully completed and the rights of way for sixty more. Up to this time $900,000 has been spent, and there is $1,500,000 more to spend when work is resumed. And it will be spent. By this time next year the parkway will be completed to Lake Ronkonkoma, about thirty-five miles in all. We hope in time to hold such races as the Vanderbilt entirely on our own property."

Great Joy Over American Victory.—The enthusiasm over the race being won by an American car was sincerely and unmistakably shown by the wholesouled cheering at the finish. "I am glad an American car won," said W. K. Vanderbilt, Jr., to one of the first that shook his hand after the race. "It was a disappointment to lose," said Herbert Lytle, "but I am glad an American car won." "I'd give five hundred dollars to see that American car win," said Henry Ford excitedly in the midst of the doubt of the last lap.

Chadwick Ran Most Consistently.—The consistent and even running of the Isotta throughout was remarkable, but it did not compare with the consistency and evenness of the running of the Chadwick up to the time that trouble and disaster befell the American car. This is proved by Haupt's times for the first four laps, which were 21:29, 21:27, 21:26, and 21:36, an average that varied only a small fraction from 66 miles per hour each of these rounds.

It Was Tantalizing, Indeed.—It certainly was tantalizing to the man that came in an automobile to see that monster grandstand rising from out of the plain and then have to ride miles to find a road that might possibly lead to a path that might eventually get his car and passengers to the haven they were seeking. On that vast prairie there will certainly be plenty of land for the building of a loop when the parkway is completed.

Should Be Provision for "Bleacherites."—In discussing the mistakes and omissions of the first race over the parkway, Chairman Thompson said that one reason for the crowd's overrunning the homestretch was that no provision had been made to furnish moderate priced seats and bleachers for the general public. He thought that had the home stretch been lined with such seats there would have been little or no trouble.

Fooled by Headlights.—The search for the grandstand at night was a really serious matter for hundreds of automobiles. There were many advertising arrows tacked on the fences, but they could not be seen in the dark. It had been announced that the grandstand would be lighted and scores of cars plowed their way across meadows only to find that they had been fooled by the lights of a squadron of campers.

Might Have Waked the Sleepers.—The homecoming on the Long Island Railroad certainly tried men's souls. The time from the grandstand to East Thirty-fourth street ferry varied from 2 1-2 to 3 hours. A large portion of the passengers had made a night of it and were asleep. A wag suggested that the trains were run slow so as not to wake the sleepers.

Harvest for Fakers.—The souvenir fakers did a rushing business. A majority of the cars returned to town with little flags bearing a Vanderbilt Cup or an automobile with "Vanderbilt Cup" inscription. In the returning trains were hundreds of papas who had bought them to take home to the kiddies.

Wagons as Grandstands.—Farmers were out by scores in their big truck wagons, which they converted into grandstands, selling the seats. The wagon drivers, by the way, did not all leave their lanterns hang under the running gear as usual, but many of them waved them in warning to avoid collision.

Feared a Big Wind.—The blackboards were a bit small, but the commission feared should a strong wind sweep across Hempstead Plain on the day of the race it would demolish larger expanses of boards. At the Grand Prix a skeleton score board was used, the numbers being hung on hooks.

Had Not the Soldiers Been Late.—If the soldiers had arrived at the parkway an hour or two earlier than half-past five o'clock, they might perhaps have headed off the vanguard of the fence-climbers and prevented the crowd from precmpting the homestretch.

Avoided Garden City Hotel.—While the Garden City Hotel was crowded it was not packed to the porches as at previous cup races. Hundreds had no hope of securing a bed or a cot and had camped out all night without making the attempt.

"Greatest Ever," Says Reeves.—"It was the greatest Vanderbilt race ever run," said Alfred Reeves, general manager of the A. M. C. M. A. "I didn't think that such a bunch of comparatively old cars were good for such a performance."

Two Notable Bostonians.—Charles J. Glidden, of touring and airship fame, and Henry L. Bowden, who made the world's mile record at Ormond with his *Flying Dutchman*, were among the notable Bostonians at the race.

"Van" Toured to the Race.—N. H. Van Sicklen, former chairman of the A. A. A. Technical Board, saw the race. He had driven to the course with his wife from Chicago in his Apperson Jackrabbit.

Lingerie on View.—Women took advantage of the darkness to scale the parkway fence. Occasionally headlights happened to be turned in their direction, adding to the gaiety.

Seventy Miles an Hour Easy.—"Lighter cars with shorter wheelbase could easily make 70 miles an hour over this course," remarked Foxhall Keene after he had retired from the race.

STRANG WILL DRIVE AT NEW ORLEANS.

NEW ORLEANS, Oct. 24.—Louisiana automobile enthusiasts are making great preparations for two days' racing carnival scheduled for November 7 and 8 at the Fair grounds. All the local dealers are entering into the plans of the promoters in a way which speaks much for the success of the meeting and through their efforts many of the factories are preparing to come to the aid of their agents with machines and drivers. Strang has signified that he will be on hand with his Vanderbilt entry and a stock car in order that he may enter not only the special events, but those for stock cars as well.

The Winning Locomobile Making a Spectacular Crossing of the Westbury Bridge.

This is an authentic and copyrighted photograph taken by R. W. Tebbs, of Brooklyn. Note the fact that all four wheels are off the ground, though the left rear wheel appears to be resting on something, that something really being the branches of a tree which happen to intrude themselves into the view. The photographer exhibits the negative to prove that the camera told the truth.

THE LEGITIMATE ZONE OF THE CHAIN.

Editor THE AUTOMOBILE:

We are surprised at the statements in your editorial in the issue of October 8, 1908, wherein you undertake, at one swoop, to eliminate the chain-driven car. If your journal is entirely a general magazine for the public, and reflecting only the public ideas of design, you have done well by representing only a portion of the public who are interested in automobiles. If your journal is a trade paper, as you claim, you have then made the mistake of making statements which are not borne out by facts, i.e., that shaft drive is now universal, or so nearly so that the statement could apply, thereby antagonizing the interests and convictions of a very large number of substantial manufacturers of chain-driven cars.

As evidence that the shaft drive is not universal, I have selected 127 manufacturers of automobiles who are really producing cars in reasonable quantity. Of these 127 manufacturers

59 make shaft drive only,
19 make both shaft and chain drive,
49 make chain drive only;

12 of the 49 make double chain drive, and 3 of the 19, makers of both shaft and chain drive—use double chains. These three are Apperson Brothers, Locomobile Company and E. R. Thomas Motor Company. The last two are the only double chain drive makers who have yielded to the public's (?) demand for a light gear-driven car. They still supply the chain drive also. These two are the only important makers who have made the change recently, while to read your editorial, one would think the whole tide had turned to shaft drive.

Your editorial is criticized by the makers of chain-driven cars as extravagant, misleading, and not borne out by facts. We feel that your position toward the trade and the public should be fair and unbiased, and if you find that it is necessary to discourage the chain drive proposition, stick to facts or arguments.

The real fact is that the number of new chain drive cars made in 1908 exceeded any previous year—and the 1909 production will in numbers almost double those made in 1908. The number of makers of chain drive cars who have changed to gear drive for 1908 is smaller than in any previous year, and the objection to chain drive by the public, and especially by the engineer, is less than ever.

The public has no doubt been the final court in the decision against chain drive—formerly they had good cause. The size of chain and sprockets, construction of the car, and the inordinate conditions under which chains were operated, caused many chain troubles, and the public naturally condemned chain transmission. The only remedy with numerous makers seemed to be that they at once change to shaft drive. In the meantime, a few makers set about to better the conditions, with the result that where the conditions are harmonious with scientific principles and laws, the chain is far more efficient, less expensive to maintain, and with less cost for upkeep of tires than is possible with the shaft drive. The public, the engineer, and the designer will appreciate this more and more, and, by natural evolution, chain drive will continue to grow in general favor.

We are pleased at the good, healthy growth of the business. We do complain of the wholesale manner in which you undertake to eliminate the chain drive, and thereby antagonize the many high class manufacturers, and the thousands of individuals, whose opinion and preference is, and will continue to be, in favor of chain drive.

DIAMOND CHAIN & MFG. CO.,
Indianapolis, Ind. L. M. Wainwright, Pres.

Your letter constitutes a fine "brief" in favor of chains. The editorial you comment upon is not, in view of the previous discussions, a stricture on side chain drives for powerful automobiles. What we said was: "It is quite probable, however, that the shaft will, sooner or later, displace the single chains, now employed on some light cars." Otherwise we reflected what can only be construed as the positive trend, *i. e.*, the light touring cars and the runabout types are adequately provided for by way of the shaft drive, which provision was seriously questioned by many, *in the past*.

This is not to say chains are not capable when it comes to light cars; indeed, it is wholly unnecessary to point out that chains are used in the cars of great power, because the chains are of undoubted ability; whereas, the shaft drive has not, as yet, been proven as equal to the occasion.

In view of these facts, we properly refrain from giving space to well understood facts and confine our reflections to the matters long under serious discussion, but now quite clear, and we repeat, the shaft drive is entitled to respect and confidence, within the zones of its common application, which is no reflection on the chain and its proven ability. The public will, of course, decide in the long run the extent of the respective applications. We will record the facts and reflect the trend.

BUSY TIMES PREVAIL IN TIRETOWN.

AKRON, O., Oct. 25.—The extensions that the Akron rubber companies engaged in the manufacture of tires are making this year and preparing to make this coming year are little short of marvelous in their magnitude. Announcement has already been made of the two big buildings to be erected by the B. F. Goodrich Company as additions to its local plant besides the branch in New York City to cost over a million dollars.

One of the most important recent announcements of proposed extensions was made this week by the Firestone Tire & Rubber Company, which announces the purchase of the plant of the Globe Foundry & Machine Company, which adjoins the rubber company on the north. Plans will be soon prepared for the erection of an immense factory on the site of the new property. Secretary S. G. Carkhuff is authority for the statement that the new building will be put up next spring, and it will exceed the addition now under construction, which is 125 feet long, 50 feet wide and four stories high. The property that has been purchased by the company consists of five lots containing several buildings. The extension is due to the growth in the tire business.

The Firestone additions make ten new factory buildings that are to be constructed by local rubber companies for the extension of their business, announcement of which has been made within the last few months.

The first definite statement was made this week by the Diamond Rubber Company as to what additions it will make since the city council has vacated an important street for the benefit of the company. Owing to the increased demands for tires, the Diamond company will make additions in order to practically double its tire output. Two large buildings will be constructed on new land that has been purchased. The first one, to be erected at once, will be 300 feet long, 100 feet wide and one story high. This is to be completed by the end of the year. Following it the company will erect a five-story building of the same ground dimensions as the one-story building. An overhead bridge will connect the present plant and the new one.

The B. F. Goodrich Company is establishing four new branch houses in addition to the 14 now in existence. The new branches are to be in Kansas City, Atlanta, Minneapolis and Pittsburg. At present tires alone will be sold at these branches, but in future all of the company's products will be distributed.

The Diamond Rubber Company at its annual election this week chose the following directors: C. A. Lake, Chicago; O. C. Barber, F. A. Hardy, A. H. Marks, W. B. Miller and O. S. Hart, Akron, Mr. Hart succeeding E. K. Hardy, who resigned. The directors chose the old officers again as follows: President, F. A. Hardy; vice-president, A. H. Marks; secretary, W. B. Miller; treasurer, A. H. Noah.

Having six of the nine American cars in the Vanderbit race Saturday equipped by Diamond tires, the Diamond Rubber company was well represented at the contest. Those present were A. H. Marks, W. B. Miller, J. A. Braden, J. D. Tew and C. B. Myers, the last named being the company's best tire expert.

H. S. Firestone, president of the Firestone Tire & Rubber Company, is at present in the West visiting the company's agencies and investigating business conditions as it pertains to the tire trade. He will visit the leading cities on both sides of the Rockies, and will be home in two weeks.

FAIR QUAKERESSES HAVE A MANLESS RUN.

PHILADELPHIA, Oct. 26.—The annual run of the Ladies' Quaker City Motor Club took place last Wednesday over a course laid out from this city to Lakewood, N. J., and return, a distance of approximately 130 miles. A score of this city's fair automobile enthusiasts took part in the run, which was led by President Mrs. Joseph J. Martin in her big Mercedes. Mrs. G. A. Reach drove her six-cylinder Stevens-Duryea, Mrs. Herbert B. Knox drove her Royal Tourist, and Mrs. S. E. Bailey drove a Pullman.

AMERICAN CARS IN SOUTH AMERICA.

After a trip of close to six months, during which time he has been traveling through South America in the interests of the Dayton Motor Car Company, Dayton, O., manufacturers of the Stoddard-Dayton cars, Sigmund Kraus has just returned from Buenos Aires, via Lisbon and Paris, and reports an excellent market below the equator for American built automobiles. Prior to making his South American trip, Mr. Kraus showed the paces of the Stoddard-Dayton to the auto enthusiasts of Habana, where the car met an unusually favorable reception. After returning from Cuba he sailed from New York on May 1, stopping at Bahia, Rio de Janiero, Montevideo and Buenos Aires, agencies for the car being established in the three last-named cities.

"South Americans are strongly prejudiced in favor of European built cars," said Mr. Kraus when seen prior to departing for the factory at Dayton, "and with good reason, for the first American cars sent down there were certainly not of the kind to build a reputation on—at least not a good reputation—and they only served to give American automobiles a black eye. But the fine construction, graceful lines, and, above all, the silent running and snappy action of the Stoddard-Dayton impressed them very favorably, so that I not only had no difficulty in disposing of the twelve sample cars that I took along with me, but took orders for several more besides. Business conditions in South America are not at their best by any means just now, and the credit system current there is another drawback to the introduction of a new car, but for all that there is a good market for the medium priced car of American make. The same thing is true of Europe, and even of France itself, in my opinion."

After spending a short time at the factory Mr. Kraus will make a trip through Mexico in the interests of the Stoddard-Dayton, establishing agencies in the principal centers, and will later cover Europe in the same manner.

POPE REORGANIZATION NEARLY COMPLETED.

HARTFORD, CONN., Oct. 26.—According to the statement given out by A. L. Pope, one of the receivers of the Pope Manufacturing Company, the plan of reorganization of the company is now but a matter of a short time until the matter can be put through the various courts. The plan of reorganization includes the deposit of first and second preferred stock and the issue of $800,000 of notes. About 98 per cent. of the first preferred stock and approximately 90 per cent. of the second preferred stock has been deposited with the reorganization committee. Of the notes needed a large part have already been subscribed by the stockholders, and if any remain unsubscribed this week underwriters will meet the situation at once. The total debts of the company were about $1,700,000, of which 75 per cent. has been paid out of the profits of the past year and by the sale of various properties not used by the company. The profits of the Hartford and Westfield factories during the past year amount to about $400,000.

BOSTON SHOW APPLICATIONS OPEN.

BOSTON, Oct. 26.—Application blanks for space in the Seventh Annual Boston Automobile Show, to be held in Mechanics Building, March 6-13, 1909, have just been issued from the office of Manager Campbell. For the coming show there will be available 105,000 square feet of space divided among seven departments, with nearly 600 spaces. As in the past the management of the show will take care of the decorations and the furnishings of all spaces, the cost of the space including these things as well as the rental. The cost of signs is also included and these will be uniform in character. The prices of automobile show spaces in the pleasure car department range from $750 to $100 each; in the other departments the space is to be sold at a fixed price per square foot. Already Manager Campbell has a large number of applications on file, and the first allotment of space will take place the first of next month.

NEW ISSUE OF AUTOMOBILE TRADE DIRECTORY.

As the result of several years' constant application, the third quarterly edition of The Automobile Trade Directory for the present year, which has just been issued under date of October, 1908, comes as near to being a complete index of the automobile industry and its legion of allied industries as it is possible to compile. The object all along has been to make The Automobile Trade Directory a valuable aid to the purchasing agent, the engineer and the factory superintendent, and, in furtherance of this, a new department has been incorporated, giving classified lists of manufacturers of machine tools and other shop equipment suitable for automobile work. This has been done at the suggestion of a number of engineers and buyers, and, as the section devoted to it comprises no less than 72 pages, its value may readily be appreciated.

The main portion of The Automobile Trade Directory is devoted to lists of manufacturers of every part, accessory and material that enters into the manufacture of an automobile, and, as an illustration of its completeness, the fact may be cited that its range comprises everything from a lamp wick to a complete car, and the information is not only put in the most accessible and concise form, but by a system of cross references, under which both the trade name of an article as well as its maker, is listed, it is easy to locate practically any manufacturer supplying the automobile trade. The entire list has been completely revised right up to the date of issue. In addition to this information, it also contains a great deal of engineering data that is of great value to both the purchasing agent and the engineer, and the presence of which in The Automobile Trade Directory makes reference to other works unnecessary.

NEWS OF THE PALACE SHOW.

The National Retail Automobile Dealers' Association has selected the Ninth International Automobile Show in Grand Central Palace as its headquarters in New York during exhibition week, which opens New Year's Eve and runs until January 7th. The Association is made up of the dealers and agents for leading American cars. Following this decision, the A. M. C. M. A. management of the Palace affair volunteered to provide accommodations for all who attend. The president of the Association is C. F. Jensen, Joliet, Ill., while J. A. Crum, secretary, is located at Oshkosh, Wis. Mr. Crum will have personal charge of the headquarters at the Palace.

Associated with L. M. Bradley, manager of the publicity department of the American Motor Car Manufacturers' Association, will be Charles E. Duryea, one of the best known mechanical engineers in this country.

Rushmore Searchlights for the British War Office.

The British War Office recently had a touring car fitted with a powerful electric searchlight by the London branch of the Rushmore Dynamo Works. The lamp contains a standard 14-inch projector, and, as shown in the photograph, is mounted at a considerable elevation so as to command a wide radius. The car carries a five-kilowatt dynamo, which may be connected with the motor by a clutch. The combination has been found very successful in the night maneuvers of the army, and it is possible that several more of the same type may be ordered.

A Stoddard-Dayton Victory in a California Track Event.

A Good Advertiser.—That A. W. Harris, of the Harris Oil Company, of Providence, R. I., is a believer in liberal advertising was shown by the Motor Parkway Sweepstakes program in which he purchased the entire advertising space. Mr. Harris happened to be the first man seen by the advertising man for the printing company, and he immediately bought all the available space. The fact that Harris oil was so much in evidence, not only on the competing cars, but in the official program, was the subject of many remarks by the spectators.

Testimonials for the Locomobile Drivers.—Recognizing the personal element in any race, as well as the quality of the tires, the Firestone Tire & Rubber Company has presented to Robertson and Florida, the drivers of the two Locomobiles in the Philadelphia race on October 10, with souvenir cups, and the mechanics, Ethridge and Connelly, medals, to show the appreciation of the company of the way in which they utilized Firestone tires during the race.

Tour of the Brush Runabouts.—The Brush Runabout Company, of Detroit, is about to put out a small booklet describing the various experiences of the five cars sent out from Detroit in August for Boston, Washington, Denver, Milwaukee, and Minneapolis. The book will be well illustrated with views taken in the different sections passed through by the five cars, showing the widely varied conditions met with.

IN AND ABOUT THE AGENCIES.

Olds, Pittsburg Branch.—The Olds Motor Works, of Lansing, Mich., has established a factory branch in Pittsburg under the management of J. V. Hall, who was formerly Oldsmobile salesman for the State of Ohio. Commodious headquarters have been secured at No. 5922 Baum street. It is planned to make Pittsburg the distributing point for all Olds cars sold in western Pennsylvania, the State of West Virginia and all the northwestern portion of the State of Maryland. This includes some thirty sub-agencies, who heretofore were handled through dealers. The agents will now handle the Oldsmobile line as a direct agency proposition.

Stepney Spare Wheels, Chicago.—The retail store of the Stepney Spare Wheel Company, 236 Michigan avenue, has been closed, and the company has established a branch house with the Excelsior Supply Company, 233-237 Randolph street, for the control of the Middle West. The other branches are as follows: Eastern territory, 1773 Broadway, New York City; Western territory, Auto Spare Wheel Company, Kansas City, Mo. Sales Manager George S. Morrow will divide his time between the three branches, and look after the company's exhibits at the coming shows.

Hyatt Roller Bearings, Detroit.—The Hyatt Roller Bearing Company, of Newark, N. J., will open an office in the Majestic building, that city, at which Peter S. Strecnstrup, the general sales manager, will make his headquarters after November 1.

Pittsburg Auto Tire Repair Company, Pittsburg.—The quarters formerly occupied by the Fisk Rubber Company, at the corner of Baum and Beatty streets, have been leased by this concern, which will take possession November 1.

Apperson, Kansas City, Mo.—The Pioneer Motor Car Company, 3028 Gillham road, with Charles Dinklage, formerly of the Kaw Valley Auto Company as manager, will handle the Apperson line for the coming season.

Empire Tires, Pittsburg, Pa.—The Consumers' Auto Supply Company, Seventh avenue and Smithfield street, has been appointed agent for Pittsburg and vicinity by the Empire Automobile Company, of Trenton, N. J.

White and Pierce, Pensacola, Fla.—A company has been formed by W. A. Gahlenbeck, of Pensacola, and E. E. Wager, of the Southern Automobile Company of Mobile, to handle the Pierce and White cars for 1909.

White, Chattanooga, Tenn.—The newly formed Crescent Automobile Company, of Chattanooga, Tenn., has taken the agency for the White steamer and opened up a garage and salesroom at 18 Williams street.

Franklin, Kansas City, Mo.—The Franklin interests in Kansas City will be looked after by Lewis A. Robertson, who has incorporated a selling company and is making full preparations for a busy season.

Stoddard-Dayton, Scranton, Pa.—Conrad Brothers, of Scranton, Pa., have closed a contract with the Dayton Motor Car Company to represent the Stoddard-Dayton cars in that territory.

Remy Magneto, New York City.—The Remy Electric Company, of Anderson, Ind., has opened a New York office in the Thoroughfare building, Broadway and Fifty-seventh street.

PERSONAL TRADE MENTION.

Zenas Carter has been appointed manager of the publicity bureau recently established by the Pettingell-Andrews Company, Pearl street and Atlantic avenue, Boston. Mr. Carter has had 10 years' experience in the printing and advertising fields, and will have entire charge of the company's automobile and electric specialties departments. A new 16-page catalogue with an exceptionally artistic cover attests the energy of Mr. Carter in getting quickly to business. The new book is called "Ignition," and lists the "J. & B." coils, vibrators, switches, spark plugs, and other specialties for which the company is agent.

Sidney B. Bowman, of the Sidney B. Bowman Company, New York City, accompanied by his superintendent, John F. Merk, sailed Tuesday on the *Cecile* for his annual trip to the Clement-Bayard factory, Paris. Just before sailing a committee representing the seventy-five employees waited upon Mr. Bowman, wished him a pleasant journey and safe return, and accompanied the compliments with a floral horseshoe. Mr. Bowman intends to return in time for the Savannah race, in which he has two Clement-Bayards entered.

Charles H. Bauer has resigned from the Studebaker Company to assume the sales management of the Austin Automobile Company, of Grand Rapids, Mich., which concern's output of six-cylinder cars will be greatly increased for the coming year. Mr. Bauer is well known to the automobile trade, having been connected with the Electric Vehicle Company, Hartford, Conn., previous to his Studebaker connection.

J. J. Mann, managing director of the Societe Anonyme des Automobiles Delaunay-Belleville, of Paris, has just arrived in this country for the purpose of making American arrangements for his company. Mr. Mann formerly had Hotchkiss connections and is well known on this side.

Charles C. Craig, sales manager of the Model Automobile Company, Peru, Ind., maker of the Great Western cars, is on an Eastern trip in the interest of the company's 1909 product, which will be equipped with four-cylinder motors.

Claude H. Pratt, who has been the Fisk representative for Ohio and West Virginia for some time, is now manager of the Cleveland branch, succeeding C. H. Gage, who has accepted a position at the factory.

IMPORTANT CLEVELAND DEAL.

CLEVELAND, Oct. 26.—The local field is about to see one of the greatest changes of recent years, for, following the announcement of the Studebaker-Garford combine, comes word that the Metropolitan Motor Car Company, local Pierce and Knox agents, has been absorbed by the Studebaker-Garford combine. This change, which has been under consideration for some time, involves the taking over of the garage of the Metropolitan Motor Car Company on East Nineteenth street, near Euclid avenue, by the new combination under the management of A. R. Davis, secretary of the Garford company. The entire garage will be changed to meet the new conditions.

The new concern will also sell the E-M-F, as well as the Studebaker electric (both pleasure and commercial vehicles). In addition the entire garage and repair shop service of the Metropolitan will be continued, so that there will be four departments in the new concern. A. E. Foss, well known to the trade, will continue as superintendent of the garage.

In addition to his local business, Mr. Davis will also have a great deal of State territory to cover, and he has selected Joseph D. Porter, formerly New York manager of the Wayne, to look after the outside interests for him. Porter will have charge of all outside territory for the Studebaker-Garford, Studebaker Electric, and E-M-F, working under the general direction of Mr. Davis.

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THE AUTOMOBILE

Quakerville's "Legal Speed Limit Run"

PHILADELPHIA, Nov. 2.—That Eastern automobile classic, the Brazier Cup contest, that in antiquity, if not in importance, exceeds even the Venderbilt Cup race, was decided on Saturday last over a 65-mile course which gave the contestants liberal variety of road conditions and an opportunity of exhibiting judgment as to pace. The field was a small one—only nine starters—but the affair was carried out with a minuteness of detail that reflected great credit on the officials. Gustavus B. Fletcher, in a Packard runabout, who won the 1905 contest, repeated on Saturday and was adjudged the winner, his penalties totaling the lowest—17 min. 30 sec.

The contest committee of the Automobile Club of Philadelphia called the affair a "legal speed limit run," and when it is remembered that the route lay through two score villages, towns, boroughs, townships, with a bewildering variety of speed ordinances to collect and adhere to, it is not to be wondered at that a perfect score was a *rara avis*. To assist the contestants, the committee allowed them not only to carry watches and speedometers, but supplied each of them with a speed chart as a partial guide. The chart divided the route into thirteen sections, in each of which the average legal speed limit was set forth. Open country was fixed of a 20-mile speed, and but two short sections of the thirteen allowed of that limit. It was amusing to see each contestant and his assistant, watches and cards in hand, keeping tabs on mileage and speed in an effort to land the cup. That the winner was nearly 18 minutes shy of the actual figures as decided upon by the committee, is an indication that judgment of speed among automobilists generally is not a common commodity.

In arriving at their decisions, the judges used the times recorded by watches at three blind controls, which must have been well secreted, for the press bunch in Wayne Davis' big Matheson could see nary a hide or hair of them, although they kept a sharp lookout. Cars that arrived at these secret controls and at the finish ahead of or behind their allotted times were penalized in minutes and seconds, and the sum total of these derelictions furnished the final scores upon which the decisions were arrived at. A good mathematician was as useful as a judge of speed.

Confetti was scattered at each turn and where speed limits changed, but in many instances the 35-mile northwest gale, which prevailed throughout, blew most of the markers into the next county, and it required veritable Sherlock Holmes work to decry among the dead leaves at the side of the road a telltale bit of the paper which rude Boreas had somehow overlooked. Many strayed from the route in consequence, which probably will ac-

count for any delays in arriving at the controls and finish. Most of the penalties, however, were imposed for early arrival, for whenever a contestant went astray he immediately "beat it" and usually more than made up the delay. An idea of the moderateness of the pace may be had from the fact that the big press car, which started absolutely last and stopped several times en route to allow the benumbed pressmen to thaw out their frozen bearings, reached the head of the line at the 40-mile point. It is to be feared, however, that Pilot Davis, who was at the wheel, and who was untrammeled by schedules, may have ignored in one or two instances the speed ordinances of the villages and townships, despite the fact that almost the entire route lay through the "trap country." Nothing could be seen from the press car.

None but members of the Automobile Club of Philadelphia were eligible to compete, and owners were drivers in every instance. The following summary will explain matters:

Car.	Owner & Driver.	Start.	Finish.	Penalties.
Packard	G. B. Fletcher	9:10 A.M.	1:02:00 P.M.	17.30
Winton	H. P. Bailey	9:18 A.M.	1:09:00 P.M.	18.30
Pennsylvania	C. Y. Abbott	9:14 A.M.	1:08:30 P.M.	22.00
Elmore	F. Hardart, Jr.	9:12 A.M.	1:06:00 P.M.	22.00
Buick	Horace Allen	9:02 A.M.	1:03:30 P.M.	32.00
Packard	E. L. Miller	9:00 A.M.	1:02:20 P.M.	52.00
Pope-Hartford	John D. Avil	9:09 A.M.	1:34:30 P.M.	71.30
Franklin	John B. Curtis	9:08 A.M.	Did not finish.	
Autocar	W. S. Harding	9:06 A.M.	Did not finish.	

This was the sixth contest for the cup, A. H. Chadbourne having won the first, Dec. 5, 1903; C. H. Gillette the second, Oct. 1, 1904; Gustavus B. Fletcher the third, Oct. 7, 1905; George L. Mayer the fourth, Oct. 30, 1906; and Alan Wood, 3d, the fifth, November 2, 1907.

FOREIGN DRIVERS ARRIVING FOR THE GRAND PRIZE

AMERICA seems now to be assured of representation in the Grand Prize race at Savannah on Thanksgiving Day, at least equal to that of Germany and France. At practically the eleventh hour three entries were made that will fill the gap caused by that number of withdrawals and give to the United States a team of five cars. The nomination of the Chadwick that distinguished itself during the middle stages of the Vanderbilt Cup race, with Willie Haupt for its driver, was made almost immediately following the Long Island contest. On Monday, the day set for the closing of the Savannah entries, a Simplex and a National were added to the list.

The Simplex is nominated by Charles A. Singer. It is the same car that won the Brighton Beach 24-hour race on October 2-3, scoring 1,177 miles, a new record. Joseph M. Seymour, who drove a Simplex in the Briarcliff race, is named as its pilot.

The National that has been nominated is a six-cylinder car of 60-horsepower. The National holds the world's 24-hour record for continuous running, having made 1,095 miles on the dirt track at Indianapolis, November 17, 1905. Since then every 24-hour race has had stoppages for "repairing" the track.

The announcement of the withdrawal of the Matheson and Locomotive cars has been made and an official statement issued that the B.L.M. would not start.

"We entered the Vanderbilt race without adequate preparation," said C. W. Matheson, president of the Matheson Automobile Company, "and have no intention of repeating our mistake at Savannah. The factory is too busy getting out our 1909 cars to be able to tinker further with our racing machine. It will, however, be thoroughly prepared and tuned up next Spring and will be a contender in all the big events of the 1909 season."

On Monday, the date set for the closing of the Grand Prize entries, four countries had made entry of teams—America, Germany, France and Italy. The last-named had nominated six cars, the others five each. The A. C. A. contest committee had no further entries in anticipation. The list was as follows:

FRANCE.	
Clement-Bayard	Lucien Hautvest
Clement-Bayard	Victor Rigal
Lorraine-Dietrich	Arthur Duray
Renault	Francois Szisz
Renault	Lewis Strang
ITALY.	
Fiat	Louis Wagner
Fiat	Felice Nazarro
Fiat	Ralph de Palma
Itala	Henri Fournier
Itala	Alexander Cagno
Itala	Giovanni Piacenza
GERMANY.	
Benz	Victor Hemery
Benz	Rene Hanriot
Benz	Fritz Erle
Mercedes	Poegge
Mercedes	Salzer
AMERICA.	
Acme	Cyrus Patschke
Lozier	Harry Michener
Simplex	J. M. Seymour
National	Emile Stricker
Chadwick	Willie Houpt

Up to Saturday seven of the European drivers had arrived. Alexander Cagno and Giovanni Piacenza, who will drive Italas, came in on the *Koenigen Louise* on Thursday. *La Lorraine*, which arrived on Saturday, brought Felice Nazarro and Louis Wagner, of the Fiat; Lucien Hautvest and François Szisz, of the Clement-Bayard, and Arthur Duray, of the Lorraine-Dietrich team. It is expected that before the week closes all of these drivers will be installed at their training quarters on the Savannah course. Of the seven arrivals, four have been winners of classic international races.

An invitation was extended to William K. Vanderbilt, Jr., who has been referee at all the international races in this country, by the A. C. A. contest committee to serve in the same capacity at Savannah. Mr. Vanderbilt declined, pleading poor health and business as an excuse.

Paul LaCroix and Sidney B. Bowman, representing respectively the Renault and Clement-Bayard in this country, sailed for Europe last week, but will return in time for the Savannah races.

The date set for the closing of nominations for the light car race, which will be run on Wednesday, November 25, was Monday. That day 19 entries had been made as follows:

Car.	Cyl.	Bore. (Inches)	Stroke. (Inches)	Weight.	Driver.
Maxwell	2	4	4	1,100	C. W. Kelsey
Maxwell	2	4 1-2	4	1,150	
Maxwell	2	5	5	1,700	
Maxwell	2	5	5	1,700	
American Aristocrat (2-cycle)	3	3.55	3.5	1,200	K. R. Manville
Cameron (Air-cooled)	4	3 3-4	4 1-2	950	F. E. Cameron
Chalmers-Detroit	4	3 3-4	4 1-2	1,600	Bergdoll
Chalmers-Detroit	4	3 3-4	4 1-2	1,600	Burne
Oldsmobile	4	3 3-4	3 3-4	1,700	
Oldsmobile	4	3 3-4	3 3-4	1,700	
Oldsmobile	4	3 3-4	3 3-4	1,700	
Buick	4	3 3-4	3 3-4	1,550	Easter
Buick	4	3 3-4	3 3-4	1,550	Jeffers
Buick	4	3 3-4	3 3-4	1,550	Hearne
Buick	4	3 3-4	3 3-4	1,550	Burman
Buick	4	3 3-4	3 3-4	1,550	Hilliard
Lancia	4	3.74	4	1,100	Lytle
Isotta Fraschini	4	2.44	3.50	1,500	Juhaz
S. P. O.	4	3.70	3.70	....	Robertson
Gregoire	4	3 2-10	5 2-10	....	

Among the last cars to arrive for the light car race will be the Lancia and the S. P. O. Signor Lancia was given short notice, but cabled he would be able to get through a car in time.

In addition to the *City of Savannah*, which the Automobile Club of America has chartered outright, the club has reserved all the cabin space in the *City of Columbus*, which will also sail the Saturday before the race. The promoters of special trains on the Seaboard Air Line and the Atlantic Coast Line, which will also serve as hotels during the races, already report large reservations.

A Western Hotel Train for Savannah.

CLEVELAND, Nov. 3.—If present plans are successful, a special train will leave this city for the Savannah races. Plans are being laid to secure at least three Pullman loads, and in case this is successful baggage and dining cars will be added. The party will live in the train the entire six days of the trip. President Bonnell of the local club is in charge of the movement.

The Best Route from New York to Savannah

Ferries of This Sort Are to Be Seen Frequently Throughout the South.

MANY readers of THE AUTOMOBILE will remember the series of articles which I wrote last Winter describing my tour m New York to Savannah. It will be recalled that the route ich I covered at that time was by no means the most direct, t led eastward over the National Highway to Columbus, O., d then southward by way of Cincinnati, Lexington, Louisville, shville, Huntsville, and Chattanooga to Atlanta, and thence way of Macon and Statesboro to Savannah. My idea at that ie was not to travel by the shortest route, but by that which ered the most interesting sights and scenes. Furthermore, a tour which I made two years ago, I traveled via Philadel-ia and Gettysburg to Hagerstown, and then down the Shenan-ah Valley by way of Winchester and Staunton to Roanoke, . It recently occurred to me that, if I could map out a de-able route between Atlanta and Roanoke, I would then be e to supply my fellow tourists with complete data for touring a direct route between New York and Savannah.

Through the courtesy of Thomas A. Edison, who two years o spent several weeks in touring through the Carolinas in his o White Steamers, I obtained considerable information re-rding the roads in these two States, and, equipped with this a, I last week set out from Atlanta to drive to Roanoke and s cover the "missing link" between New York City and annah.

Georgia roads are bad—unpardonably so—except in those few nties in which the large cities are located. If I may digress a moment, I would like to point out a recent happening in t State which points toward a rapid improvement of its hways. There had grown up in rgia what is known as the nvict lease" system, whereby the victs were leased to "convict ters" at a nominal sum by the ral counties. The brokers, in , leased out the convicts to the ers of mines, brick-yards, and ber-camps, who worked the con-s "to the limit." As a result, a ll number of very influential ens and office-holders benefited tly by the system, and the con-were never sent out to work ie roads, except in three or four ties. The abuses of the "con-lease" system became so pro-ced that a vigorous campaign st it was started a few months by an influential newspaper, the nta *Georgian*. As a result of campaign, which opened the of the people of the State to iquities of the system, the gov-convened the legislature in session and the "convict lease" m was annihilated by statute.

Just a Touch of Southern Color.

Therefore, there is now nothing for the convicts to do but to work on the roads. If one county cannot use all of its own convicts on its own roads, it must lend them to any other county which applies for them. Thus it happens that an impetus has been given to the good roads movement in Georgia, the importance of which cannot be overestimated.

The good highways in quantity, however, are yet to be built, and on that drizzly October day when we set out from Atlanta we found it necessary to put the tire chains on the wheels of our White Steamer to prevent skidding off the slippery clay roads. The roads are not all of clay. There are many miles of sandy roads with deep ruts made by the farmers' wagons, all of which travel in one track. This is the time of year when the cotton crop is being marketed, with the result that we met countless teams on the road. In many instances, meeting a team meant that we had to stop and lead the horses or mules by our car, or, perhaps, wait until the driver could turn into some cross-road or "take to the tall timbers." Under such conditions, the progress of the tourist is necessarily rather slow.

Our route led by way of Lawrenceville, Winder, Jefferson, and Royston to Hartwell. Six miles beyond the latter town we crossed Brown's Ferry across the Savannah river into South Carolina. By an ingenious arrangement the current of the river operates the ferry. A cable is stretched from shore to shore, well above the level of the river, and the ferry-boat is connected by two chains to sheaves which run on the cable. By altering the relative length of the two chains, the angle of the ferry-boat to the stream is changed so that the current moves the boat in either direction which may be desired by the man in charge.

I might say here that in our entire journey from Atlanta to Roanoke, a distance of 490 miles, we had hardly one hundred yards at a time of level country. We were always going either uphill or downhill. In Georgia, the grades are sometimes very steep—dangerously so, it seems, as one guides his car down a winding road with a surface of wet clay and a deep ditch at either side. But as soon as we crossed into South Carolina we noted that the roads had been laid out much more carefully. The road surface was not much better than we found in Georgia, but the gradients were very much less.

Anderson was the first important town we passed through in South Carolina, and next we reached Greenville, a hustling city located 167 miles from Atlanta. As far as Greenville we had been cutting "cross country," in the sense that we

Odd Landmark Dividing Winston and Salem.

Convicts Smoothing the Way for a White Steamer.

Typical North Carolina Macadam Road.

In the Tobacco Market at Winston-Salem.

had not followed any line of railroad. At Greenville, we struck the main line of the Southern Railroad, and for the next 150 miles, or as far as Salisbury, N. C., we were seldom very far from the main line of this road.

All the way from Atlanta we had been in a cotton country—in fact, we had seen little else being raised. The farmers' wagons we had seen were all loaded with cotton or with cotton seed—the cotton being taken in bulk to the gins and then in bales to the towns for shipment. Starting about at Greenville, we noted a new phase of the cotton industry, namely, the cotton being made into cloth at the point of production, instead of being shipped to Fall River or to Manchester. We began to realize what is meant by the "New South." It means that in every town along the railroad great cotton mills have been built within the last few years, which compare in size with those of New England and excel them as regards up-to-date equipment. It means that vast electrical power plants have been built to utilize the great natural water powers of the State. The current is used primarily to turn the spindles in the cotton mills, but, incidentally, to bring electrical illumination into almost every home in the towns. It means that beside cotton pickers, the South needs masons and electricians and artisans of every kind, and that it is drawing the enterprising and the ambitious from every section of the country.

On we go, through the cotton fields, past the cotton mills, through Spartansburg and Gafney and Blacksburg, and then we cross the State line into North Carolina near the town of Grover. Next we pass through Bessemer City, Gastonia, and Belmont, and then—*mirabiledictu*—we are on a macadam road! For the first time since we left Atlanta, the hand of our speedometer passed the "30" mark—and keeps going. We slow down again when we meet the chain-gang, busily engaged with stone-crusher and steam-roller building more macadam, leading to the ferry, where another of those "automatic" affairs takes us across the Catawba river. We are back on the macadam, and in a jiffy we have covered eleven miles, which takes us into the center of Charlotte, 284 miles from Atlanta.

How South Carolina Came to Have Roads.

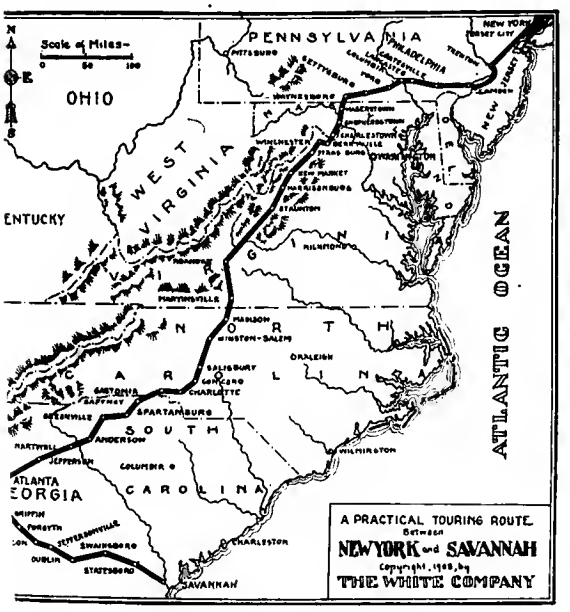
Here we took on as guide, O. L. Barringer, the original good roads man of South Carolina. He told enthusiastically of the progress of the good roads movement in the neighborhood of Charlotte. It seems that some years ago a group of enthusiasts induced the county to build a few miles of macadam road. The farmers along this stretch immediately learned, rather to their own astonishment, that their farm land was worth $10 an acre more than before. Other farmers heard about this, and they wanted a macadam road built past *their* farms. When a good roads movement progresses so that the farmers become actively interested in the cause, the automobilists need no longer worry very much about the matter. In that section of North Carolina the good roads movement is progressing famously, as we could see for ourselves. We drove from Charlotte to Salisbury, a distance of 46 miles, in a little over two hours. The road was not all of macadam, but where the steam-roller and the chain-gang had not yet done their work, we saw piles of stone at the side of the road, betokening that the good work would shortly be accomplished.

The macadam road lasted for a few miles north of Salisbury, and then we came once more to a section where the roads are as yet left to take care of themselves. Gradually we were getting out of the cotton belt and coming into the tobacco-raising country. The tobacco crop had all been harvested, and the farmers were engaged in taking it to market in their queer boat-shaped wagons, which are characteristic of that section.

Forty miles beyond Salisbury we came to the quaint town of Winston-Salem, famed as a tobacco market. Tobacco wagons by the hundreds lined the streets waiting to discharge their fragrant cargoes at the warehouses. We were told that over half a million pounds of tobacco were brought in by the farmers on the day that we passed through the town. Leaving Winston-Salem, we had a stretch of 12 miles of flawless macadam road

Kernersville, the last we were to see on our trip. From rnersville we turned due north and traversed a fair dirt ad through Oak Ridge and Stokesdale to Madison. From s point on we had rather poor going.

Thirteen miles north of Madison we crossed the State line o Virginia, and during the rest of our journey the roads were ite as bad as in the State of Georgia. We followed a single- ick railroad due north as far as Martinsville. Up to this int we had been traveling on the eastern side of the Blue Ridge ountains, which run practically parallel with the coast. The ik which now lay before us was to cross this range into the enandoah Valley. The road across the mountains would prob- ly be reasonably good in dry weather, but it was raining ien we made the trip, with the result that the going was very avy and so slippery that we could not make any progress iatever without tire chains. How many times has the thought curred to me (as it must have to many other tourists) that e makers of accessories have not kept pace with the car makers l many a long, hard tour my steam car has carried me through thout any attention other than filling the oiler, the grease ps, the water tank, and the gasoline tank. But how many ies have I stopped to fuss with one accessory or another.



ad the weather been clear, our journey across the mountains ld undoubtedly have been the scenic feature of the entire , as the foliage of the trees bore a most gorgeous autumnal ring. As it was, with the rain coming down in torrents and tire chains giving us constant trouble, it was with a great ng of relief that we brought our journey to a close in front of iotel in Roanoke.

dry weather, a good amply powered touring car should be to average about 150 miles a day for the entire journey. ainy weather, I do not believe that there are many tourists would average more than 75 miles a day south of Roanoke. uld advise those who are planning to drive from New York ivannah that they start at least two weeks prior to the time e races, so that they may have ample time if they encounter weather. I would further advise no one to start on his vithout taking at least four sets of tire chains for the rear s. As I have indicated above, progress over a wet clay is practically impossible without tire chains. As regards accommodations, one may fare very well along the route. nust, of course, not expect luxurious accommodations, but ly be quite sure that in any town of any size he need not bed hungry, and if one has been driving all day in the

For Miles Only Crop Raised Is Cotton.

open air, the question as to whether the beds are soft or not is entirely academic and not of vital importance.

The accompanying map will show what I regard as the most practical route between New York and Savannah. I have personally driven over every foot of this route, and, therefore, am able to give below exact mileages of the distances between the different towns that dot the course at intervals:

A Cotton Gin at Every Important Crossroad.

New York to Philadelphia	108
Philadelphia to Gettysburg	120
Gettysburg to Hagerstown	84
Hagerstown to Winchestsr	53
Winchester to Staunton	93
Staunton to Roanoke	88
Roanoke to Winston-Salem	121
Winston-Salem to Charlotte	85
Charlotte to Anderson	148
Anderson to Atlanta	186
Atlanta to Macon	102
Macon to Savannah	186
Total	1,274

Cotton Mills Are Numerous in "New South."

WHAT THE WORLD'S ROADS CONGRESS DEDUCTED

By W. F. BRADLEY.

PARIS, Oct. 20.—Europe's fourteen principal states possess pproximately 1,000,000 miles of ade road, estimated to be worth 5,000,000,000, and to have cost in pkeep $160,000,000. France alone as 500,000 miles of highway fit or fast traffic, exclusive of a mass f roads good for light traffic. With the advent of the railroad the ighways of Europe were robbed of heir heavy traffic; in France they vere well kept, but unused, or at ny rate unused for the purpose or which they had been created. Then, instead of means of communication they became playgrounds for the children in the neighborhood of villages, they became an extension of the farmyard, where cattle, fowls and pigs could stray about without fear of being molested.

Why Autoists Are Numerous in France.

When the automobile came into existence ten years ago the few hardy sportsmen who traveled round the country on their noisy machines had a perfect set of highways which they shared with nobody. Suddenly the authorities awoke to the fact that the automobile was skimming over these smooth military-made roads, that they were in such numbers that the surface, once perfect, was rapidly being deteriorated, and that France was in serious danger of losing her proud possession of 500,000 miles of sandpapered highways.

Minister of Public Works Barthou looked the facts squarely in the face, recognized that new systems must be adopted for new methods, and decided to call together an international congress uniting representatives of all nations, and experts from all countries. The response was an assembly of 2,500 members, speaking 29 different languages, and officially representing 28 different governments.

For ten days the twenty-five hundred have deliberated on the future of the roads, have studied the exhibition collected from all quarters of the globe, have visited and compared every example of experimental road work within forty miles of Paris, and have made copious notes.

Roads Unsuited for Fast Mechanical Traction.

It is admitted, as a starting point, that the automobile, more as a result of its speed and its numbers than because of its own special construction, is destroying the roads. To put it more equitably, the roads, as at present constructed, are unsuitable for heavy and fast mechanical traction. L. W. Page, director of the United States office of Public Roads, went into this subject in one of the 102 papers presented, declaring that the damage was done by the tractive force or shear exerted by the driving wheels of motor vehicles.

"At high speeds," he declared, "there is a considerable amount of slip, as is proved by connecting both front and rear wheels with separate speedometers. This slip undoubtedly increases the amount of finely divided material of the road surface thrown into the air. The broken stone road surface has little power to resist a shearing stress, consequently the fine material of which it is composed is carried into the air, subjected to the air currents caused by the body of the car, and subsequently to the wind."

Several other delegates who treated the same subject explained that on paved surfaces the effect of rubber tired wheels was practically nil. The case of the Avenue des Champs Elysées reserved entirely to automobiles, was given as an example of the small amount of damage, the only effect of the rubber tires being to polish the wood blocks smoother. Granite or other hard stone pavement, if laid on a solid foundation, hardly suffered at all from automobile traffic. The binder between granite blocks might be sucked out by the action of the pneumatic tires, but this could easily be remedied by the use of more suitable material. Chains and all anti-skid devices came in for criticism as road destroyers on powerful cars driven at high speeds, one English road builder going to the extent of proposing fine or imprisonment for all who used them. It was quickly pointed out, however, that under a makeshift system it was often necessary to use non-slipping devices, though they might be injurious, which would be unnecessary under scientific methods of road construction.

Robert Philipps, consulting surveyor of the Gloucester County Council, was of opinion that rubber tired vehicles did not require a very strong road, but they must have a smooth surface, the effect of pneumatic tires jumping from ridge to ridge being to file or grind the upper surface of the metal, suck out the binding material and lossen the road. Below twenty miles an hour there was little damage; above twenty miles an hour the effect was serious. Beyond what was due to speed, little damage was done by either solid rubber or pneumatic tires.

Ideal Road Varied from Point of View.

The ideal road varied according to the point of view of the expert, influenced by the conditions under which he had been trained. Smooth granite paving was frequently advocated where traffic was heavy, either for cities or for main country roads. Made brick pavings, and various types of asphalts also found adherents though asphalt was not usually recommended except where traffic was of a lighter nature. "Nothing but granite sets would withstand the constant effort of traffic," declared several of the English experts, supplementing the statement, however, with the remark that the granite must be properly laid on a foundation of cement.

"A smooth basaltic or granite macadam road is the ideal for rubber-tired automobiles," declared Robert Philipps, one of the English delegates. "For both horse and motor traffic it was necessary that the cross section should be as flat as possible, to prevent side slip; this kind of road was not at all detrimental to horse traffic, though rather difficult of drainage. All curves should have a radius sufficient to enable approaching vehicles to be seen around the curve. All roads joining at right angles should be trumpet mouthed at their junction."

The excessive crown of roads was in the opinion of M. Moissenet, chief of roads and bridges at Montauban, one of the causes of unnecessarily rapid deterioration.

In order to preserve pavements and roadways Engineer Caldagues, of the Paris roads and bridges department, insisted on the necessity for more and more proscribing the placing of gas, electric, and water mains under roadways. When a departure has to be made from this rule, the road department should reserve to itself the care of replacing the roadway against reimbursement on a suitable tariff.

Harder and better material was constantly insisted upon for macadam roadways, in order that they might be able to resist the effect of fast traffic. There should be increased cohesion by longer rolling, by the use of proper binders, and by surfacing with tar. Tar roads, which have been very extensively experimented with in France, were not received with full favor by the congress. It was only after long discussion that a non-

commital resolution was passed, in which the conference "recommended paving for a remedy against dust where traffic was heavy and intense. Crude oils and deliquescent salts were a remedy against dust, but were only ephemeral in their results. The congress believed that tar was undoubtedly a remedy against dust, that in a certain measure it protected the roads against the destructive effect of automobiles."

France is more interested in the building of tar roads than any other nation, having at the present time 1,400,000 metres of tar roads, compared with 550,000 square metres for England, and 510,000 square metres in Germany. Dr. Guglielminetti, the president of the Anti-Dust League, was of opinion that if tarring could not replace asphalt or paving on roads of very heavy traffic, it gave excellent results on roads of moderate traffic, and especially where automobile traffic was very intense. The skin of tar prevented the pneumatic tire from sucking up the binding, and for this reason prevented the grinding down of the roadway. In Paris tar surface has increased from 21,000 square metres in 1904 to 360,000 square metres in 1907.

F. G. Carpenter, of the West Riding of Yorkshire, was of opinion that nothing was so effective as the use of tarwashing. The application of tar forms a waterproof sheeting over the surface of the road protecting it from the weather and thereby lengthening its life. The best result was obtained after a new sheeting of metal had been rolled in and allowed to dry, when the tar penetrated the surface much more deeply than on application to an old or partly worn surface. A lengthening of the life of the macadam of about 20 per cent was obtained by the use of tarwashing.

Experiments with Tar-sprayed Surfaces.

A feature of the different visits to Paris and the immediate suburbs was the opportunity for examining the latest experiments of macadam roads with various kinds of tar-sprayed surfaces, and such methods of construction as Tarmac, Pitch-macadam, Aeberli and others, in which the material to be used is prepared and mixed with tar before being brought to the road under construction. As many of these processes were in an experimental stage, the congress, while recognizing that the suppression of the dust nuisance was doubtless to be found in this direction, did not pronounce definitely in favor of any one system. The future will tell.

Road signs were discussed entirely from the European standpoint, the points insisted upon being simplification and a reduction of the number of signs in use. Jacques Ballif, president of the Touring Club of France, protested against unnecessary matter on the government sign posts, asking what use it was to be told on every post that the road was a departmental or national one. The omission of such matter would tend to simplicity. The president of the Touring Club of France agreed to abandon the word signs which are at present in use in favor of a system of wordless signs as used by the Association Generale Automobile. It was decided that four signs were all that were necessary: to indicate danger points, frequent turns, railroad crossings, and dangerous cross roads. The A. G. A. signs, which were used in the last Vanderbilt Cup race are at present about twelve in number, the warning being given by a simple white diagram on a black ground, without any necessity for wording. Several thousand Touring Club of France signs have been put throughout France, and are still useful for slow traffic. For fast motor traffic they have considerably diminished in value, for it is generally impossible to read them at speed, and they are placed too near the danger spot to be effective.

A Typical Road in France, of Which There Are Many.

Roads Exhibition Attracted Attention.

Apart from the deliberative gatherings, a very extensive roads exhibition attracted much of the attention of the members of the congress and the general public. The exhibition united a vast amount of material connected with the building and maintenance of roads, and several useful comparative exhibits from city councils, road departments, etc.

The city of Paris put forth an interesting comparative exhibition of its experiments in the adoption of mechanical substitutes for horse traction in the street sweeping and watering department. The first mechanical sweeper and sprinkler was a steamer adopted in 1901, and still doing service. As its weight, however, is nearly eleven tons, its effect on roads is such that it cannot be considered a complete success. The second mechanical sweeper was operated by a two-cylinder Aster gasoline motor, which gave excellent service and is still in use. Three years ago a larger sweeper and waterer was adopted, the motive power being a two-cylinder De Dion of 15-18 horsepower, driving the vehicle at 8 to 9 miles an hour. Except that the power was found to be rather low, this was considered very satisfactory. It had been decided to take out the two-cylinder motor and substitute a four-cylinder model of the same make. A Mors watering cart was shown for use on wide avenues where traffic was fast and intense. Its four-cylinder 24-horsepower engine gave a speed of 10 miles an hour, which was sufficiently fast to avoid interfering with traffic, and its sprinklers could cover a width of 70 feet at one watering.

There were one or two cases of the conversion of horse-drawn sweepers to gasoline-driven machines, by the adoption of a front drive device, a two-cylinder gasoline engine transmitting power through longitudinal shafts and universal joints to the front road wheels. The rear portion of the machine was unaltered, the drum being revolved from chains on the road wheels, as in the old horse system. The experiment had been found more economical than the abandoning of horse material.

Also in the city of Paris exhibit were several examples of portable single-cylinder De Dion gasoline engines mounted on a suitable stand and driving a wood-block trimming machine. The outfit was naturally for use on the streets, and was used where no electric mains were laid. Where electricity was obtainable it was preferable to use an electric motor link up to the mains.

Among the private exhibits of the application of motor vehicles to road maintenance purposes were several mechanical sweepers, one of the most pleasing being fitted with a two-cylinder Renault engine carried forward and driving by propeller shaft an internal gear to the road wheels, the drum being operated by sep-

ırate shaft and single chain. This idea attracted careful examnation, and proved to be a most interesting exhibit.

Among the American delegates taking part in the congress vere: H. H. Cross, Chicago; Samuel C. Lancaster, Professor Highway Engineering, University of Washington, Seattle, Wash.; Samuel Hill, president Washington Good Roads Association; R. H. Thomson, city engineer, Seattle, Wash.; E. L. Powers, publisher *Good Roads Magazine*, New York; Harold Parker, chairman Massachusetts Highway Committee, Boston; Anstin B. Fletcher, secretary Massachusetts Highway Committee, Boston; Chandler Withington, chief engineer, Department of Finance, New York City; Arthur W. Dean, state engineer, New Hampshire; Nelson P. Lewis, New York; G. L. Clarke, Boston; William S. Hogan, New York.

Papers were presented by Ch. W. Ross, Newton, Mass.; L. W. Page, U. S. Board of Public Roads; Col. Chas. S. Bromwell, Washington; Clifford Richardson, New York City; John A. Pettigrew, Boston, and Philip W. Henry, New York City.

SECOND ROAD CONGRESS WILL BE HELD IN 1910

PARIS, Oct. 26.—The 2,250 members of the first International Road Congress have dispersed to their respective twenty-nine countries, leaving behind as a permanent record an international road office established in Paris, a mass of decisions regarding road building and maintenance for automobile traffic, and a resolution to meet again in Brussels for the second confabulation during the Belgian Exposition of 1910. At this second meeting the delegates will be the guests of the Belgian Government.

Considerable value is attached by all the members, and especially by the American delegation, to the formation of the permanent association, controlled by an international commission, and having offices in Paris. It is this association, composed of two members per nation, and having as its temporary officers those who administered the present Congress, which will be responsible for the second gathering at Brussels. Its most important work will be to collect information regarding experiments in road building, to organize and encourage chemical and mechanical experiments with tar and other road building material, and generally assist in the adaptation of highways to modern conditions of locomotion.

Conclusions of the Final Assembly.—These, after discussion in the sections, are somewhat voluminous, and are not limited in their application. Dealing with the present road the congress found better material should be used, and that greater attention should be paid to foundations. A cement bed 4 to 6 inches thick should be paid for all pavings, whether with large or small blocks. There should be a thin layer of sand between the foundation and the blocks. Experiments with tar or bituminous products incorporated into the road-making material were recommended, in order to arrive at some cheap and efficient method of carrying on this work. Paving with small stones having been reported to give excellent results as regards resistance and cheapness, it was recommended that they should be further tested with various kinds of traffic.

General Methods of Maintenance.—Complete resurfacing, in place of partial repairs, was recommended. Also the entire width of the roadway should be resurfaced at one operation wherever possible, the traffic being turned off into side roads while work was in progress. Hard and homogeneous road material only should be used, the binder should be suitable to the road, and moreover reduced to a minimum. Authority to lay water, gas, and electric mains under paved roads should only be granted in exceptional cases, and for want of any other practical solution.

Anti-Dust Crusade.—Paving and other improved surfaces were recommended as a remedy for wear and tear, as well as to remove the dust nuisance. It was considered that oiling, the use of deliquescent salts, etc., were efficient as a dust remover, but their benefit was not of long duration, and their use could only be recommended for special occasions. Planting of trees along the roadside was recommended with a view to the suppression of dust. The official decision on surface tarring was that when well carried out it was undoubtedly an efficient remedy against dust and that to a certain extent it protected the roads against the destructive action of fast vehicles. Experiments in tar-made roads were not considered to be sufficiently advanced to allow of a decision. Experiments, however, should be encouraged.

Future Roads.—That it should be well constructed of hard material, resisting and not slippery, was understood. In addition the future road should have a single track for all vehicles, with the exception of high-class avenues, and in no case should the width be less than 20 feet. Camber should be as low as possible, compatible with efficient drainage. The radii of curves should be as great as possible, and in no case less than 164 feet, while the outside should be banked slightly. Nothing should be allowed which would obstruct the view at curves; intersecting roads should be visible and very wide; grade crossings should be avoided, or if this were impossible they should be properly announced both day and night. A narrow footpath on the inside of all curves was highly recommended, with a strict law against dumping road material on it. Though multiple track roads were not recommended, except in special cases, it was believed that cycle tracks and horse paths should be laid on the side of the road. The line of the road should be clearly defined by trees.

Effect of New Modes of Locomotion on Roads.—The Congress being composed in majority of professional road-makers, with automobilists poorly represented, there was no attempt to minimize the damage done by mechanical vehicles. Fast vehicles were declared to disintegrate the road by scattering the binder, the damage being in proportion to the speed. Too harsh an application of brakes and rapid acceleration were responsible for injury, while changes of gear did damage, though in a smaller degree. Hardened metal-studded tires were condemned, smooth tires being recommended, or if really necessary, studs of soft metal. Chains, being unknown to Europe, were not discussed. Heavy commercial vehicles should have smooth rims except in special cases and on certain roads. Heavy vehicles were declared to cause injury by depressions and ruts, and to avoid this the pressure per inch of tire should be as light as possible. A maximum of 825 pounds per square inch of tire, with diameters at present in vogue, was voted for.

Road Signs.—A uniform system of marking distances for the entire country was recommended. Unnecessary matter on sign posts should be eliminated. There should be four road signs only, announcing danger spots on the road, sharp turnings, grade crossings, and dangerous cross roads.

Road Services and Mechanical Transportation.—An average speed of 11 and a maximum speed of 15½ miles an hour were recommended for all large passenger-carrying vehicles, omnibuses, etc. The weight of the driving axle should be reduced to a strict minimum and in no case should exceed four tons. Heavy commercial vehicles were given an average speed of 6 and a maximum speed of 9 miles an hour, with an axle weight of five tons, the weight per centimeter of width of tire not to exceed 150 kilos with wheels of existing diameter.

It was the opinion of the congress that light railroads should be laid outside the bed of the road; wherever it was practically possible these lines should be on special tracks leaving a width of roadway of not less than 16 feet. When trolley car tracks had to be laid in the roadway they should be at the level of the surface, without projections or depressions, and without any change of profile, either transversely or longitudinally. The roadway should be such that a width of at least 8 feet would be provided clear of the portion on which the trolley cars run.

ABOUT AUTOMOBILE SPRING SUSPENSIONS

By THOS. J. FAY, President Society of Automobile Engineers.

THE reason for the adoption of springs will best be understood if we take into account a version of the law of the application of forces. As, for illustration, if a "tup" is tripped and it falls 10 feet, provided it weighs 100 pounds, the energy of position of the tup will represent 1,000 foot pounds, and when it strikes the energy will be expended, manifesting itself in heat and other vibrations. It cannot be said that the effective force

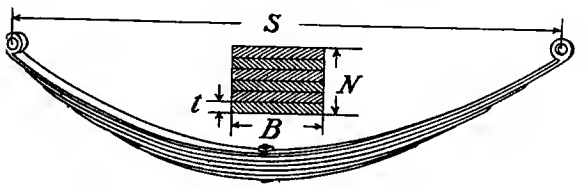


Fig. 1.—(a) Half elliptical spring, showing sections referred to in the formula.

of the blow will be as 1,000 foot pounds, because the effectiveness of the impact of the tup will depend upon the distance in which the motion is arrested. If, for instance, the motion is arrested inside of a distance of one inch after initial contact, the blow will be equal to, say, unity. But if the blow is arrested within one-half inch after initial contact, the force of the blow will be doubled. But should the anvil give but a thousandth of an inch, the force of the blow will be equivalent to *one thousand times the force as first put down.*

In this we have an illustration of the fact that it is not the weight of the body or the distance it migrates that goes to make the sum total of results; indeed, it is a question of the distance in which motion is arrested for the most part. Coming down to the automobile, it is plain to be seen that the spring suspension of a chassis frame and the superimposed body will be effective in proportion as the springs show capability, by way of arresting the motion within the distance said to be agreeable and at a periodicity of the pendulum action also said to be agreeable.

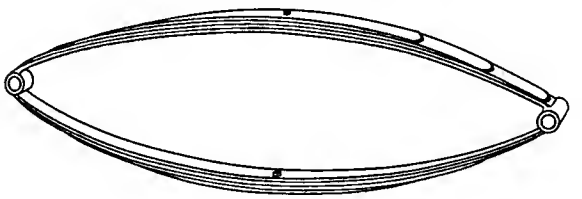


Fig. 2.—(b) Full elliptical spring.

Obviously, then, there is no standard to go by, because what one man calls agreeable, another may call something else. On the other hand, this question of what constitutes an agreeable motion can be put to some extent in dollars cost, since the anticipations of pleasurable riding will depend considerably upon how much the autoist has to pay for the pleasure. If a car is high in price, and the spring action is so terrible as not to compare favorably with the spring action in comparatively low priced cars, the unlucky autoist will consider the action disagreeable, and justly so. If, on the other hand, a car is very low priced, the purchaser thereof may be quite well satisfied with a very inferior spring performance. He may, for that matter, get all that he pays for. Under these conditions, it is difficult to appreciate what should constitute the standard spring suspension from the point of view of result, rather than the point of view of the manner of suspension.

If some types of springs do the work, affording better results than do others, it would seem as if the springs of the inferior results should be eliminated. On the other hand some types of springs work well on certain classes of cars and are valueless in other cases. This being so, it does not follow that all springs should be of the same type and all cars should be swung in the same way.

Several Types of Springs.

In relation to this matter it might be thought the types could be arranged after some fashion logical. On second thought it is to conclude there is no logic in this connection, because the several types of springs were used from time to time on all the types of cars extant. It will not seem out of place, therefore, to enumerate the types of springs largely as they appear on cars at the present time. They may be set down as follows:

(a) Half elliptical; (b) full elliptical; (c) full elliptical, one end scroll; (d) full elliptical, both ends scroll; (e) three-quarter elliptical; (f) three-quarter elliptical, one end scroll; (g) three-quarter elliptical, riveted end; (h) platform; (i) concord; (j) helical.

Each of these types of springs are shown in the illustrations, and each of them will be found in cars, unless it is a fact that the

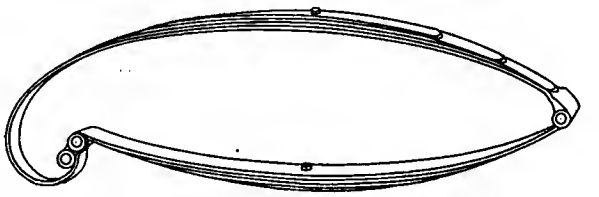


Fig. 3.—(c) Full elliptical spring—half scroll spring.

helical spring is no longer used as a direct suspension, nor has it ever been to any great extent, although it is well represented in the shock absorbers of the day.

Considering laminated plate springs, since they are all modifications, they can all be resolved through the use of a single formula by a step to step process. Such a formula, for illustration, might be as follows:

$$N = \frac{W\ S\ k}{b\ t^2}$$

in which:

S = span in inches (see Fig. 1);
b = breadth of plates in inches;
t = thickness of plates in 1-16 inch units;
W = load in tons (2,240 pounds);
N = number of plates;
k = a figure of convenience = 11 in ordinary work = 15 in the best automobile practice, and can have values between 11 and 15 as the exigencies of the service may indicate.

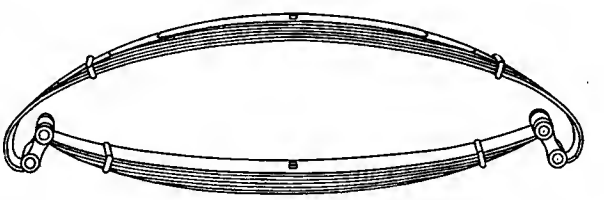


Fig. 4.—(d) Full elliptical spring—both ends scroll.

In laminated springs, ribbed cross sections are more rigid and much used in commercial vehicles, also in connection with pleasure automobiles abroad, otherwise, the plates are usually with

Fig. 5.—(e) (g) Illustrating a three-quarter elliptical spring.

round edges, but are not flat, as may be generally supposed. They are concave, and the difference of the thickness at the center is about equal to 1 B. W. G. thickness. Such plates are used in sizes as follows:

B. W. G. Nos.	Thickness in inches.
0	.34
1	.30
2	.284
3	.259
4	.238
5	.22

In automobile work there are few, if any, examples of springs, in which the thickness of plates will be found, to be thinner than No. 5, or thicker than No. 0, B. W. G.

In some cases the plates are quite rectangular in section, the edges being flat, with a slight radii at the corners. In other cases the spring leaves are ribbed, illustrations of which will be found elsewhere in this article. There is one other point, as shown in Fig. 7, which takes into account the contours of the ends of the short plates. It is believed by some spring makers, and the author has a superstition or two in relation to the same matter, that the behavior of a spring is effected by the shape or contour of the ends of the short leaves or plates. At all events, the short plates should be tapered down toward their ends, and if a supple spring is the aim of the designer it might even be well to terminate the ends of the short leaves in what is designated as the "French" contour. This contour looks very well in the finished product and possesses the advantage of more gradually bringing the shorter leaves to the support of those of greater length.

While this question of suppleness of springs, which might otherwise be termed easy riding qualities, is on the tapis, it will not be out of place to discuss some of the means by which easy riding qualities may be arrived at. In the first instance it is passing strange that the designers of some cars should expect any one to furnish springs such as would afford easy riding qualities. Take, for illustration, a limousine of the most approved artistic appearance, let us say of aluminum, and at a cost of $2,000. If the aluminum is backed by plaster of paris and a goodly showing of hardwood, by way of a framing, and if this limousine is hoisted by means of a traveling crane (suggested because of its weight) onto the chassis of a car in which the center of gravity might be high, not taking into account the effect of the body, as above described, the work the springs would have to do can scarcely be regarded as coming within the province of springs.

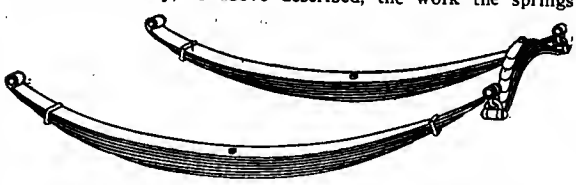


Fig. 6.—(h) Characteristic platform type of spring.

The conditions are not all included, because it is just such a body and just the car described that will have a water tank on the deck of the limousine and perhaps two or three tire cases and other paraphernalia. The "top bamper" will, therefore, mount up to figures quite beyond the "top hamper" that should obtain, even under more favorable conditions. There are no springs, either by way of types, or in the matter of design, that will afford easy riding qualities under the conditions as above illustrated. Indeed, it may be fortunate, but it is a fact, too, that there are no tires that will sustain under such conditions, and so we may say, if the spring problem is severe, the tire problem becomes impossible.

In spring making there are matters to be considered as follows: (a) the materials of which the springs should be made; (b) the facilities for use in fashioning the spring plates; (c) the facilities for use in heat-treating the spring plates; (d) the design of the springs with a view to the work to be done; (e) the manner in which the springs shall be tested. As respects the materials, enough is to say they will be given separate space hereafter. When it comes to the question of the facilities for use, in fashioning the spring plates, it will be easier to state what should not be done rather than to elaborate upon the other phase of the question. At all events, the material comes in mill lengths, and the leaves or plates have to be cut from this material, so that the first thing to consider is whether or not the texture of the material is altered by the shearing process used in cutting the spring plates from the lengths as they come from the mill. The author is of the opinion that the texture of the material is

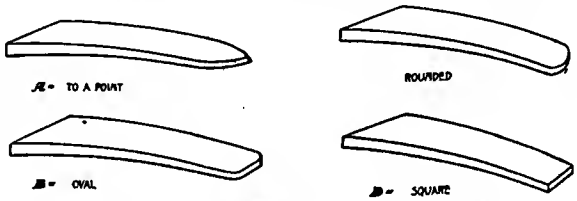


Fig. 7.—Four customary types of end trimmings.

altered for perhaps a full half inch back from the point of shear, and so it would seem that the lengths as cut from the mill lengths to make the leaves should be somewhat longer than will be required in the actual finished product.

The next question to be taken into account is that involving the thickness of the leaves in a given spring. Shall all leaves be of one thickness, or shall we have all of one thickness, excepting the main leaf, which might be of a greater thickness, or shall all the leaves be of a different thickness? The spring maker will have his say, because he sells the springs by the pound and because the more plates he has to handle per pound the more work he will have to do per dollar. If the spring maker fixes the pound price first he will then be inclined to fix upon the least possible number of leaves for the spring, thus giving him the maximum weight for the minimum cost, hence increasing his profit at a previously fixed price.

It is not intended to say that spring makers deliberately start out with the idea of skinning, but it is believed that they may beguile themselves into thinking that the less the number of plates in a given spring the less the chance of breakage for that reason alone. Of course, they know that for a given camber, the thicker the leaf the greater will be the extreme fibre strain, and with them it is a compromise as between cost and risk of breakage, due to overstepping the bounds from a fibre strain point of view. The same spring makers are justified in their course to some extent, for the reason that easy riding qualities are more nearly approached as the fibre strain in the material used more nearly approaches the elastic limit of that material. The danger lies in exceeding the point of safety, from the point of view of kinetic ability of the steel used.

(To be continued.)

WHAT IS THE BEST MOTOR TIMING?*

By LOUIS LACOIN.

VE have already sbown that it is necessary to wait until there is a degree of depression in the cylinder before open- the inlet valve, and it will be apparent that even a considerable will produce but little depression. If the cylindrical volume ¼-litre, or 750 cu. cm., and the dead space ¼-litre, or 250 cm., a displacement of 25 cu. cm., is necessary to produce in cylinder a vacuum of 0.1 atmosphere. Now, 25 cu. cm., cor- ond to 4 mm. of tbe stroke for a piston having a stroke of mm. (Cylinder 89 by 120 mm.=750 cu. cm.) It is hardly essary to state why an excessive lag should not be given the ning of the inlet valve, thougb sucb a practice would not be nded by any serious inconvenience, wbile a premature open- of the valve would permit the entrance of an excessive unt of air. Tbis consideration explains the lag of the motors ady mentioned, as well as the following: *Ours* (1), 15 de- s; *Hotchkiss* (7), 17 degrees; *Brouhot* (9), *Rochet-Schneider Cornilleau Sainte Beuve* (10), 20 degrees; *Berliet* the same *Hotchkiss*, and *Aries* (25), 18 degrees. Larrad recommends legrees.

Which Should Operate First?

his brings us to the third question, which is raised by the ing of the *Mutel* (11), *Larrad* (31) and the *Peugeot* (17) aulieu). Larrad, for example, recommends a 17-degree lag the inlet and 22 degrees for the exhaust. During the inter- ing 5 degrees, both valves are open. Is this an advantage? it can easily be seen that Larrad's theory can be sustained. ves do not operate instantaneously, he maintains. If the t valve begins to open 17 degrees beyond the dead center, egrees later, it will not be open more than a fraction of a limetre. Likewise, if the exhaust valve remains up to the nty-second degree, at the seventeenth it would not have been h nearer to closing, and the advantage is gained that the t and exhaust are both more free during their limited period, le the fact of both valves being open at the same time pro- s, with mechanically operated valves, the same effect as is ized with tbe automatic valve; the exhaust continues as long ere is any excess of pressure in the cylinder, and the aspira- commences the moment there is any depression. This point asily demonstrated as the movement of the gas in the ex- t manifold does not cease instantaneously. The inertia of gaseous mass continues to draw out the last particles of burnt despite the opening of the inlet valve, and when the exhaust s, the inlet already being open, the introduction of the fresh immediately begins. To this, it might be said that if the ning of the aspiration had any great influence on the power e motor, or upon its efficiency, this theory would not be de- le, or would at least, be well justified. But it has neither. slight initial depression scarcely bas any effect on the up- movement of piston, particularly as it is so shortly after- descending under the ordinary depression of aspiration. far as the volume introduced during the admission stroke ncerned, this may be measured by the displacement of the t between the point that the exhaust valve closes and the of closing the inlet valve in turn, assuming in both cases an equilibrium of pressure has been established between terior of the cylinder and the external air. Thus it mat- little whether the inlet valve opens before or after the ex-

If the exhaust closes, for example, when the piston has ded 1.5 mm. of its stroke, and the inlet opens but an t later, the first inrush of fresh gas will begin to fill the traveled by the piston after this 1.5 mm. of the stroke; the introduction of the gas will be somewhat retarded, but it will take place nevertheless. If the inlet valve is closed 6 mm. after the piston has reached the dead center, there will be 6 mm. of the stroke less explosive gas in the cylinder and the useful volume will be reduced by 1.5 mm. at the beginning and 6 mm. at the end, or 7.5 mm., or a deficit of .075 per cent., assuming the length of the stroke to be 100 m. This reduction of tbe volume and the consequent loss of power must be regarded as a necessary evil, for if the valves were opened and closed at the dead center, the loss would be even greater.

Should Both Valves Be Open at Once?

We are still far from having arrived at an answer to the third question and it is now opportune to revert to it. It seems that among those, such as the *Unic* (29), for example, whicb allow an interval of 24 degrees between the closing of the exbaust and the opening of the inlet, and those which, like the *Larrad*, open the inlet before closing the exhaust, there is certainly a sufficient range in which to find a mean. Without exaggerating the lag given the opening of the inlet, it seems to us that it should be slightly later than the closing of the exhaust. Imperfections in the actual timing on the motor itself will soon suffice to modify the predetermined arrangement by 4 or 5 degrees. Take a motor with a complete index on the periphery of its fly-wheel and a pointer on the crankcase corresponding to it, and order a repairman to time it exactly, and it is quite probable, that, whatever be his skill, he will not strike it by several degrees. As a mean average, it may be estimated that this error will amount to 2 degrees each way, or 4 degrees in all, and it would seem necessary from this to open the inlet 4 degrees after the closing of the exhaust. This is the regulation of the *Eudelin* (21), the exhaust having 4 degrees lag, and the inlet 8 degrees, while the *Motobloc* (5), is practically similar with 5 and 10 degrees. The *Hotchkiss* (7), allows slightly more, the exhaust having 10 degrees and the inlet 17 degrees, the *Berliet* (12) being still further apart, *i.e.*, 9 and 17 degrees, or 8 degrees apart. These figures all appear well founded.

Should we, in view of all these diverse timing arrangements attempt to distinguish what may be called the typical regulation? We hardly believe so, for, as we have already mentioned a number of times, the amount of advance or lag depends upon a number of variables in one motor and anotber; we might almost say from one cylinder to another, and those who have made much use of the manograph would probably not differ with this. A standard regulation would then be very poor for extreme cases, and if the little instrument of which we have been speaking, could improve many of the timing arrangements, it could hardly pretend to produce the maximum output or efficiency in every case, as its inventor claims. But in spite of all, we can by way of further information, give a résumé of the mean of all the angles as compared with the *Larrad*. These are:

	Mean average.	Larrad.
Lead given the exhaust valve.....	46°20′	52°
Lag in closing inlet valve.....	25°32′	17°
Advance of the ignition.....	31°15′	var.
Lag in closing exhaust valve.....	5° 8′	22°
Lag in opening inlet valve.....	12°16′	17°.

The *Brasier* (16) shows a remarkably close approach to this mean, coming within 5 degrees of it, while its r.p.m. rate is also near the average, 1,350, instead of 1,370, the length of its connecting rod being the same, 4.5 instead of 4.6. It is not to be inferred from this that many of the others are not equally good. The best are to be found in the *Motobloc* (5), *Hotchkiss* (7), *Cottin Desgoutes* (8), *Cornilleau Sainte Beuve* (10), *Mutel* (11), *Berliet* (12), *Eudelin* (21), *Farcot* (22), *Aries* (25), *Sultan* (27), *Renault* (28), and *Unic* (29). In order to be able to judge

er read before the Society of Automobile Engineers at its nd Meeting, September 18-19, 1908. Translated from the of "Omnia," by Charles B. Hayward. Continued from 07.

—The occasion for the present article was the appearance of e known as the Larrad for indicating proper timing.

of the others, it would be necessary to know more about their mechanical arrangements.

Having divided these degrees of the circumference of the circle so carefully and arranged them as indicated, is it possible to learn the time in which the motor takes to traverse the various divisions? Take for example, No. 30; it makes 1,700 r.p.m., describing in *one second,* 10,200 degrees. Each degree is thus divided into less than 0.0001 second, from which the extreme rapidity of the performance of each one of the parts of its cycle necessary to its efficient working may be realized. And still some designers refuse it a poor little thousandth of a second in which to perfect its exhaust. Those 10 degrees of retard would probably still further improve a motor already remarkable.

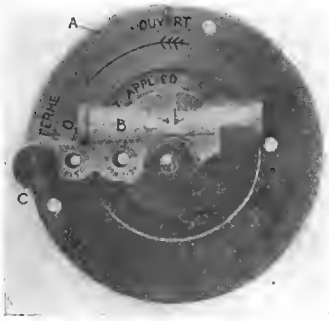


Fig. 1.—Larrad apparatus for regulating the timing of motors. A, disc, pierced with a series of holes; B, spirit level, in the case of which is a hole for each of the preceding series; C, pin to secure holes in different positions. Arrow indicates direction of rotation.

Description of the Larrad.

As shown by the illustrations, Figs. 1 and 2, this device consists of a plate *A,* mounted on a shaft *E,* integral with the piece *D,* a spirit level *B,* and the pin *C.* In the plate are three series of holes, while in the piece to which the spirit level is attached, there are but three holes, one for each series, and the pin is used to insure the registration of any two holes. To use the device, the part *D* is attached to the crankshaft, or any part that turns with it, this being arranged so as to most conveniently suit the circumstances. For example, it could be placed between the cone and the flywheel where it would be firmly held against movement. Its only conditions of mounting are that the shaft *E* must be parallel to the axis of the crankshaft, so that when turned, this shaft will describe a circle round the axis of the motor shaft, and not a cone; second, that once the plate *A* has been fixed in position, it can be revolved without coming in contact with anything. This second condition is frequently very difficult to comply with when a motor is mounted on the chassis, although the *Larrad* can be mounted on the starting crank, but the accuracy of the timing thus secured might be questionable.

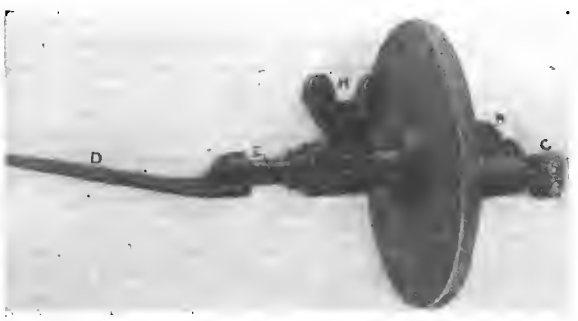


Fig. 2.—Profile view of the Larrad. A, disc; B, spirit level; C, pin; D, blade for attaching; E, shaft to be fixed parallel with the crankshaft; H, winged nut fixing disc A to shaft E.

Assuming that the piece *D* has been attached to the motor with the shaft *E* perfectly parallel with the axis of the crankshaft, the operation is commenced by registering the hole marked *exhaust,* with the hole *zero,* which corresponds to the upper dead center. The motor is then turned over, either with the crank, or by pushing on the flywheel until the piston reaches the upper dead center. The plate *A* is then turned until the spirit level shows that it is perfectly horizontal; the screw *F* is then tightened, fastening the plate *A* to the shaft *E,* and the device is then ready. See Fig. 3, No. 1. Then drawing out the pin *C,* it is inserted in the holes already mentioned, and the motor is turned until the spirit level is again horizontal. This will indicate the exact position at which the tappet should begin to raise the exhaust valve. See Fig. 3, No. 2. All the other essentials of the timing are regulated in the same manner and without removing the device from its support. In this manner, the screw is inserted in the hole *exhaust* of the socket, and the hole marked *closing,* on the plate, the motor then being turned over again until the level indicates the horizontal. The instrument simply indicates the different positions of the crankshaft corresponding to the different essentials of the timing. It must be borne in mind in using it that the cycle occupies two revolutions of the motor, and that the plate *A* to which the level *B* is attached, be so fixed that the direction of the arrow *G,* corresponds with the direction of rotation of the motor. It will be seen that the apparatus is very easily employed and that it permits of great accuracy of regulation, besides avoiding errors. It is quite probably that with frequent use by different designers, they would be able to modify the plate to suit their own motors. Unfortunately, up to the present, the inventor has only provided the single plate mentioned, claiming that the regulation he has outlined is the only perfect one.

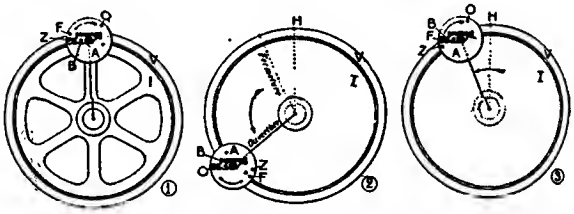


Fig. 3.—Larrad apparatus mounted between the cone and flywheel. 1, position of upper dead center; 2, position of opening of exhaust; 3, position of closing of exhaust. A, disc, pierced with holes; B, spirit level; F, closing of exhaust; H, dead center point; I, clutch cone; O, opening of exhaust; V, flywheel; Z, upper dead center point.

THINGS THAT MIGHT BE LEFT UNDONE.

Familiarity with the appearance of the motor-car on the one hand, and some amelioration of its design on the other, have done much to remove the charge of ugliness that was so often thrown at the auto in its early days. A good deal remains to be done before the eye of the artist will be satisfied, and some things should be left undone. Under the latter heading may be included the undue use of covers. One may approve the carefulness of the man who fits neat dust covers to the upholstery, though somewhat as one may smile at the prim old lady who concealed the legs of her piano in—er—garments for decency's sake, but the running of a car with the lamps swathed in chamois leather bags is surely an example of the unco' careful that is calculated to arouse unfavorable impressions. A bright lamp is doubtless a thing of beauty, but it will not be a joy forever if it is concealed under an article, which, if not a bushel, is equally impenetrable by the eye of man. If the lamps are to be carried and coddled at the same time let them be stowed in an inconspicuous locker constructed for the purpose, not paraded around in a manner suggestive of cocoanut shies and curling papers. But if bright lamps must be hid under a bushel, does it not suggest some other finish for the lamps? Something besides brass, such as oxidized iron, for instance.

NEW ENGLAND SHOPS ARE MORE THAN BUSY

By CHARLES B. HAYWARD.

IF those there be who are still skeptical regarding the present highly prosperous condition of the automobile industry, and the fact that the prospects for the coming year are far and away better than they have ever been at any time in its history, a visit to some of the New England factories would certainly do much to remove this impression. In some things New England is sectional, but as its automobile output finds its way to every part of the country, frequently being as well represented on the Pacific coast as it is in the East, there can be no doubt but that the prosperous conditions prevailing there are duplicated by other automobile manufacturing centers, and that the healthy activity to be found in every plant east of the Connecticut State line is reflected in the full-force working conditions of every automobile factory of note the country over.

Bridgeport Takes Pride in Locomobile Plant.

Bridgeport takes considerable pride in the presence of the Locomobile factory in that city, as was strikingly evidenced recently by its spontaneous outburst of enthusiasm on receiving the news of Robertson's victory in the Vanderbilt race, and its regard for the big plant as a home institution extends to its product as well, for to the Bridgeporter the Locomobile is the one real car, and he is willing to back his belief with his money, as is amply substantiated by the great number of locally owned machines. This pride is further quickened by the spick and span equipment of the fire department supplied by the home factory, and that the reputation of the Locomobile company in this field is not merely local is shown by the presence of several special jobs of this kind now under way at the factory for several other New England cities. Two of these are specially designed chemical auxiliaries and the other is a hose truck. All are being constructed on the regulation 40-horsepower, chain driven Locomobile chassis, a special feature being the use of pneumatic tires on all of them. The tire equipment is being supplied by the Fisk company, and consists of 40 by 6-inch rears, which indicates that New England municipalities are not averse to paying the price of speed when it is a question of getting there a little sooner.

These special jobs are naturally but a very small part of the activities of such a factory as the Locomobile plant, the bulk of the work now being carried on consisting of the first series of the new Model L shaft-driven "Thirty" Locomobile for 1909, which is already coming through in numbers. This is supplemented by the work on the 40-horsepower chain-driven car, which is being continued without any changes of importance for the coming season, and the calls for a car of this type show that it will be a long while before the chain-driven model disappears entirely, if such is ever the case, as for machines above a certain power it has many faithful advocates, who will probably always remain true to their convictions in this respect. This is shown by the remarks of former buyers of Locomobiles who have had an opportunity of viewing the new shaft-driven model. "It's a beauty, but a chain drive would make it perfect," sums up the opinions of many.

In the Making of Motors Particularly.

Although not exactly a New England shop, the Jencick Motor Company's location in Portchester, right on the State border, practically brings it within this category, as it is the first of a long line of plants extending along the shore that make a specialty of marine motors. In addition to its routine work of turning out both automobile and marine motors of smaller sizes after special designs, there is now nearing completion there an eight-cylinder, 200-horsepower motor the ultimate mission of which will be to "trim" the *Dixie II* at the motorboat carnival at Palm Beach next spring. It is intended to form the power plant of the *Richard Croker, Jr.*, the hull of which is now under construction at the Herreshoff works in Rhode Island.

Speaking of motors takes one back to Bridgeport, where the American & British Manufacturing Company has plans under way for a large output of automobile motors during the coming season. The products of this concern is already finding its way into the chassis of more than one assembled car in the East, and it will figure as the power plant of at least one car that will have America's automobile center—Detroit—as its home. Motors of about 25 and 40 horsepower will be specialized, and facilities of the company make it possible to turn these out in large numbers at figures which cannot be approached by smaller builders. The Bridgeport Vehicle Company and the Royal Equipment Company are two other members of Bridgeport's automobile population, and both are hard at work.

Automobile Interests in Every Town.

It is pretty hard to find a town in New England that does not contain at least one factory which contributes its quota to the sum total of automobile building in this country, and there are probably few whose product is more widely distributed than that of the Manufacturers' Foundry Company, located in Waterbury, just north of Bridgeport. Within a comparatively few years this concern has developed the art of automobile cylinder casting to a point where the foreign artisan can no longer compete with the American product. Just north of Waterbury, in the little town of Torrington, spark plugs and other small specialties are turned out by the Standard Company by the thousand.

A twenty-minute ride east from Bridgeport brings one to New Haven, which is the home of the Bowers carbureter, Mayo radiators, Gilbert fabric specialties, tire cases, and the like, and the Cowles and New Haven carriage mountings and trimmings, from which it will be evident that every place "Down East," whether large or small, has its representatives.

Half way between New Haven and Hartford is the town that is probably better known for its silver-plated ware than any other in the world, but in the past few years it has jumped into prominence as the home of the Connecticut coils and other ignition specialties made by the Connecticut Telephone & Electric Company, and the pressure under which this concern is at present running strikingly reflects the demand in general.

Corbins for 1909 Well Under Way.

Within less than half an hour's ride from Meriden is the plant of the Corbin Motor Vehicle Corporation at New Britain, where every effort is now being centered on the production of the new models for the coming season. The first series of the water-cooled Corbins is already well under way, and at this factory the testing cars are put to an even more strenuous test than that of the two or three hundred mile road run under the watchful eye of the factory expert that is ordinarily given them, as the makers of the Corbin utilize their testing cars to a large extent in doing freight duty between New Britain and Hartford, thus expediting the delivery of much needed materials, and at the same time giving them the preliminary running in and inspection that is an essential step in the history of the chassis as it progresses from the first stages to its final delivery to the purchaser. Naturally, the freighters form but a small part of the fleet of Corbin testers on the road, but this utilization of the cars is but one example of the little economies now being practiced by automobile manufacturers, such as the use of the current generated by motors on the testing stand. Formerly this energy was wasted by being dissipated through a resistance, and this is still a more or less general custom.

Since the introduction of the new type of ball bearing developed by Mr. Rockwell, of the New Departure Company, Bristol has come into prominence as an automobile town, and this is to be further accentuated in the near future by its posing as the sponsor of a fleet of taxicabs, which will be the product

of the Bristol Engineering Works, where their building is already well under way. It seems somewhat of a coincidence that Designer Moskovics should also be using his first cars as freighters, and the loads of parts and other materials that they are called upon to tote over short and comparatively long jaunts, such as to New Haven, give excellent promise of their durability in their ultimate field of usefulness.

Hartford Is An Auto Center.

With two large factories and a host of smaller interests, Connecticut's capital city can well lay claim to being a New England center of automobile activity. With the prospect of the plan of reorganization now afoot being speedily completed, the entire plant of the Pope Manufacturing Company has been rushed to more than its full capacity for some time, night work having been the rule for several weeks past. It is said to be the ambition of the Pope Company that every resident autoist should be the owner of a Pope-Hartford, and to judge from the number of cars of this make continually seen about the city, it would seem that this desire has been realized to a very great extent. What with the continual stream of testers issuing from the plant on Capital avenue and the preponderance of privately owned cars of this make that are to be seen on every hand, it strikes the casual observer as if there were nothing but Pope-Hartford cars permitted there.

At the other big Hartford factory present activity gives promise of a brighter future than appeared to be in store for it since the Packard negotiations fell through. It can justly lay claim to having been the first completely equipped automobile plant to be established in this country, and while some of its equipment may now be out of date, there are few factories on this side of the water that can surpass its facilities for turning out work, and by work in this connection is meant as much, if not more of the complete automobile than the average maker produces in his own shop. Some idea of what it is doing in a quiet way, and with far greater efficiency than was the case in its heyday, may be gained from the fact that between September 15 and the end of the year close to 200 of the 30-horsepower gasoline cars and 50 of the Victoria-phaeton type of electrics will not only have been manufactured, but actually sold.

Besides its two large factories, Hartford can boast of a multitude of interests devoted in greater or less measure to the automobile. It is the home of the Hartford and K-B universals, the Veeder tachometers, Richardson ignition specialties, and other parts makers, and is also the headquarters of one of the largest distributing houses, the Post & Lester Company.

Over the Commonwealth's Border.

Just above the Connecticut State line one strikes Springfield, which is congratulating itself on the excellent showing made by two Knox cars of stock pattern for 1909 against specially designed machines of far greater power in the Vanderbilt race two weeks ago, and when one comes to consider how very small these cars are compared with those built for nothing but racing, there is indeed good reason to marvel at their highly creditable and consistent performance, for, after all, what the buyer wishes most is endurance and reliability, and these were shown to a superlative degree. These two Knox cars of 38 and 45-50 horsepower respectively are the representatives of the Knox line for the coming season, on which the factory is now busy, and the prospects are that it will turn out more cars for 1909 selling than ever before in its history. Auto fire apparatus is also a Knox specialty to which considerable attention is being devoted, together with other commercial work.

Springfield is one of the few Eastern cities that can boast of being the home of a two-cycle car—the Atlas. One of the chief activities of this plant during the past year has been the manufacture of taxicabs, which are now to be seen in quite a number of the larger cities, and this will doubtless be the case to a far greater extent during the coming year, as with its extremely simple and reliable power plant the Atlas cab is one that can be entrusted in the hands of the unskilled driver with far greater safety than where there are a number of small parts to be monkeyed with. Although the success met with in this field has caused a large part of the company's time to be devoted to building cabs, the work of turning out the regular models for pleasure use has not been neglected.

In addition to turning out two and four-cycle cars, Springfield can probably lay claim to manufacturing more motorcycles and more metal bodies than any other American town, the works of the Hendee Manufacturing Company, makers of the Indian motorcycles, being close to the Knox plant, while the Springfield Metal Body Company holds forth in another part of town.

Chicopee Falls, while so close to Springfield as to be practically a suburb, is proud of its independence, and, population considered, there is probably no other town in the country that contains within its limited confines automobile interests of such importance, as it is the home of the Stevens-Duryea Company and the Fisk Rubber Company, the plants of both of which are running in full blast. To say that the town is "Stevens-Duryea" through and through is to put it mildly. Outside of automobile circles, it has a reputation as the home of the Stevens firearms, and it also contains other important factories, but in the past few years the big automobile plant, which is constantly enlarging, has overshadowed them all. At present it is running through two or three hundred of the new Model X, four-cylinder cars, the specifications of which were made public last Summer. And as things go quickly at the Stevens-Duryea plant, there are cars in swarms. Soon it will begin to turn out the first series of the "Big" and "Little Six" cars, which will come forth this year in a considerably altered guise.

As for the Fisk plant, the most that can be said of it is that it is turning out tires and then more tires, and as that is its business in life, what more is there to tell about it?

Activities Further Eastward.

Worcester has numerous auto interests in the shape of the Baldwin Chain & Manufacturing Company and the drop-forging plant of the Wyman & Gordon Company, that turns out crank-shafts and other forged parts in large quantities; the White & Bagley Company, oils; Coates Clipper Manufacturing Company, Graton & Knight, the Windsor Manufacturing Company, etc. Boston has a multitude of auto activities, particularly when its numerous outlying suburbs, such as Waltham, where the Orient is produced; Beverly, the home of the Cameron; Lynn, where the G. E. Co.'s auto shop is located; Amesbury, with the Gray & Davis lamp works; Jamaica Plain, with the Napier, and a host of others too numerous to mention, are considered. It is the headquarters of the National Brake & Clutch Company, of cork insert fame, beside a number of other accessory interests, and is considered the best auto selling center east of New York, besides being the sponsor of more freak designs than have ever come out of any one town. The E. T. Burrows Company is bending its efforts toward making Portland, Me., an automobile manufacturing town, and the result will probably be seen at the shows.

Turning southward on the circuit, one strikes Providence and Pawtucket, the former the home of the American Locomotive Company, which is at present very busily engaged on a number of things that it does not wish to say anything about, while its entire force is kept working at high pressure to turn out enough taxicabs to meet the demand, as this is a specially designed machine throughout, and is built independently of the line of four and six-cylinder pleasure cars, not to mention the attention that the company is devoting to commercial work.

The Brown & Sharpe Company, Providence Engineering Works, Standard Machine Company, and American Ball Company are some of the other concerns a large part of whose product goes to swell the city's automobile output. As the home of one of the Maxwell factories, Pawtucket is another Rhode Island city that can lay claim to automobile fame, and the activities of the Maxwell plant there bid fair to carry its name all over the country during the coming year, if not to more remote parts of the globe.

LETTERS INTERESTING AND INSTRUCTIVE

THE SPECIFIC GRAVITY OF GASOLINE.

Editor THE AUTOMOBILE:

[1,613.]—Tel me bow to read a Baumè hydrometer. The meter sank in tbe gasoline to 65 degrees. * * * * * *

Bastrop, La. A. G. KNOX.

The specific gravity, in degrees Baumè (equivalent) for liquids lighter than water, will be found (at a given temperature) by means of the Baumè hydrometer scale. If this hydrometer has also a thermometer, the utility of the same will be obvious, since the specific gravity and temperature may be noted simultaneously. A separate thermometer would answer the same purpose.

The specific gravity of the gasoline is not constant under conditions of varying temperature, and it is best to reduce the temperature (always) to the same point (say 60 degrees F.) before noting the specific gravity in degrees Baumè. The temperature can be regulated by merely submerging the test tube (holding the gasoline) in a bath of water and regulate the water temperature by means of ice or hot water.

In conclusion, however, it may not be out of place to state that gasoline is not graded by the refiners, on a basis of specific gravity, and it is probable that the specific gravity even when measured, will avail nothing at all.

The fractional distillates of the hydrocarbons are graded within limits of temperature, at or near the mean temperature of ebullition, of the components. It is the temperature of ebullition then (at the atmospheric measure) that is wanted; not the specific gravity (mean of the components). Since the value of fuel is dependent upon its adaptability and that, in turn, is governed by the temperature at which the gasoline vaporizes.

USE OF LIVE AXLE WITHOUT DIFFERENTIAL.

Editor THE AUTOMOBILE:

[1,614.]—Kindly advise me in your "Letters Interesting and Instructive" wbsther a 1,500-pound automobile, with 98 inches wheelbase, could be operatsd without a differential; by this I mean using a solid live axle. Or wouid the strains in rounding corners tend to break the axle and cause severe wear on the tires—these to be of solid rubber? Supposing considerable care was exercised in making the turns, could the automobile be handled successfully?

Staten Island, N. Y. HARRY LAWRENCE.

Unquestionably the automobile could be handled without the differential, but it would hardly be advisable to do so under ordinary circumstances, for every-day use. We believe that some machines of the high-wheel buggy type dispense with the differential, but these drive the rear wheels by ropes or wire cables, which allow a certain amount of slip. On the other hand, some high-powered racing cars have been built with solid live axles. If your machine is of the high-wheel type, and is not intended to make more than twenty miles an hour, you may do without the differential; but fitting one would be safer.

WHAT IS THE TERMINAL PRESSURE?

Editor THE AUTOMOBILE:

[1,615.]—I will appreciate an answer through "Letters Interesting and Instructive" to tbe following question: What is the pressure in the cylinder of a 4 by 4-inch motor just before the time of the opening of the exbaust valve, the motor, of the four-cylinder four-cycle type, running at 900 r. p. m. As the compression epace of the motor varies greatly, I will ask you to take any standard motor.

Nsw York City. C. N. H.

It might approximate thirty pounds per square inch. In a given motor this "terminal pressure" is a variable depending upon the conditions as follows: (*a*) the carbureter; (*b*) the areas of inlet valves in relation to the areas of pistons; (*c*) the shapes of cams; (*d*) the design of the intake; (*e*) the speed of the piston; (*f*) the leaks of compression will lower the pressure; (*g*) the efficiency of the spark; (*h*) the timing of the spark; and other minor details, as cooling, etc. A statement of pressure, then, is the merest approximation.

IS THE STROKE PRODUCTIVE OF POWER?

Editor THE AUTOMOBILE:

[1,616.]—Please state through your columns which of the following two engines will develop the most power going at the same speed. First one witb a bore and stroke of 4 1-2 by 4 1-2 incbes, and one with a bore of 4 inches and a stroke of 4 1-2 inches.

East Orange, N. J. SUBSCRIBER.

$$H\ P\left(\frac{d^2\ l\ n\ s}{10^9}\right)4$$

When d^2 = square of bore of cylinders in millimeters;

l = stroke in millimeters;

n = number of cylinders;

s = speed of crankshaft r. p. m.:

For the $4\frac{1}{2} \times 4\frac{1}{2} = 108 \times 108$ m/m, approx.

$$H.\ P. = \left(\frac{108^2 \times 108 \times 4 \times 1000}{10^9}\right) 4 = 20, \text{ approximately.}$$

For the $4 \times 4\frac{1}{2} = 101 \times 108$ n/m approx.

$$H.\ P. = \left(\frac{101^2 \times 108 \times 4 \times 1000}{10^9}\right) = 17.6, \text{ approximately.}$$

This is on a basis of 1000 revolutions per minute, which is not the maximum power speed. The probable maximum (conservative) speed would be about 1300 r. p. m. You ask for the relative ratings however; hence, the maximum power speed may be disregarded.

KEROSENE IS BETTER THAN NOTHING.

Editor THE AUTOMOBILE:

[1,617.]—I am very much interested in "The Automobile," and look forward eagerly to each new issue. "Letters Interesting and Instructive" are of much value and may be made more so if careful observers will report their experiencee. Automobile "doctors" certainly disagree widely and a driver of small experience is at his wits' end to know wberein the truth lies.

Your answer to "A. G. D." about the kerosene treatment for carbon deposits in cylinders would indicate a very limited experience for the writsr when be says: "We have never heard any objections to this practice and do not see any cause for them except laziness." I have found it a frequent topic of inquiry and argument when two or three of the elect are gathered. The makers of my car, a four-cylinder, 35-horsepower, advise its use, but their New England road expert (endurance driver and Glidden "godder") says no, and I have followed his advice the last 1,200 miles witb good results. Why does a certain decarbonizer advertieement say, "No kerossne"? To me that suggests the existence of an adverse opinion.

As regards decarbonizers, it ought to be known by this time whether they will do the work without injury to the engine. If they have not got it right yet, they will soon have it. One of tbe oldest and greatest scientific authorities writes me: "We have independent information of tbe successful use of a chemical compound for the removal of the eolid products of combustion deposited upon cylinders and valves of automobiles and similar engines. It is guaranteed not to damage the metal in any way, simply volatilizing the carbon which passes out of the exhaust with the gases of combustion."

Descending hills I cut out the spark and give the engine about all the gas it will take, and have an idea it serves to clean out the cylinders, etc. Is there any efficiency in that? Does it serve any good purpoee to apply kerosene along the eides of the springs?

Have tests ever been made to determine how far a given amount of gasoline will drive a car at different speeds; in other words, what is tbe ratio of increased fuel consumption to increase of speed? J. H. NETTLETON.

New Milford, Conn.

Irrespective of the incidents in the history of this subject, it is a fact that kerosene oil has been much used in cylinders to avoid evil influences of carbon deposits. One of the companies at one time provided facilities, by way of a tank of kerosene and suitable means, by which the operator of the car could inject kerosene oil into the cylinders at frequent intervals.

Motors so treated seem to thrive and the carbon deposits do not seem to grow in the cylinders. A great many people have used kerosene oil in the cylinders for the same purpose, and the kerosene undoubtedly will creep in behind the crust and loosen

the same from contact with the metal; once loosened, it will, of course, blow out as soon as the motor is started.

If you used a decarbonizer (and the same is efficient for the purpose) it would seem superfluous to employ kerosene oil as well. As to the efficiency of decarbonizers, there seems to be no question at all, and they differ from kerosene oil in that they prevent the forming of any considerable crust, whereas kerosene oil will loosen the crust after it is formed. One is a preventive; the other a cure. Wisdom dictates the use of the preventive, and if the makers of the decarbonizers guarantee that they will not etch the polished surfaces of the cylinders, the guarantee may he taken no douht, since they are the best judges of what they use and its action on metals.

You can best scavenge your motor on a descent by cutting off the gasoline and allowing a free circulation of air; if you are not equipped to separate the gasoline from the air, the presence of the same will do no damage unless by a "muffler shot" when you switch in the spark. Springs should not have an application of kerosene oil; it is better to jack the body upwards to relieve the springs of their weight, pry the leaves apart, and, with a squirt can, apply oil to the bearing surfaces of them. The leaves are concave, thus affording a space for this oil, and the slippery surface resulting will prevent squeaking, on the one hand, and the unequal distribution of strains on the other; while it is true as well that rust formations will be absorbed.

The fuel consumption will depend upon the wind resistance above 20 miles an hour, and the wind resistance in turn depends upon the front area of the car. Simultaneously with these considerations will be the question of the road condition, as it will affect the mechanism of the car, etc. Below the point at which you have to take into account wind resistance, the fuel consumption will be proportional to the power required to drive the car, if the carbureter is exactly suited to the purpose and if the motor is driven at its most efficient speed, which demands that all speed changes be made through the good office of the gear set.

Having fixed all of these conditions, if you then determine the draw-bar pull of the car (which is not the same for all cars) and the gasoline required per ton mile at that draw-bar pull, the consumption within the limit stated may then be approximated. We have records of tests of this character under conditions of actual practice, but they are of no value whatever excepting in connection with the very car involved.

SOME FINE CARS HAVE WOOD FRAMES.

Editor THE AUTOMOBILE:

[1,618.]—I am planning a light runabout and would like to know if you think a frame built of hickory or white oak would be efficiently etrong to eupport about 750 pounds and etand the usual road straine and ehocke. The car ie to have a wheelbase of about 90 inchee. Of hickory or white oak, which is the best suited for the purpoee? What would be the proper dimensions of the wood for a frame of thie kind? AN INTERESTED READER.

New York.

Either hickory or white oak, if well seasoned and second growth, would suit your case admirably. It is not so easy to fit the dimensions without knowing as to the locations of the laterals. If laterals come well spaced the thickness of the side member can be reduced, and vice versa. As a general statement, we would think the section might be one and one-half inches thick by four and one-half inches deep, and that the side members could he tapered off to three inches at the ends. The iron work will have some to do with the ability of tlie finished frame, but these are all matters in relation to which you are no doubt already well informed. Ash, rather than the woods you mention, is employed altogetber by the makers of the Franklin cars, owing to its great resiliency. It is made in laminated form.

MR. SOREHEAD ON THE CHAUFFEUR.

Editor THE AUTOMOBILE:

[1,619.]—The word chauffeur is a name applied to that species of genue homo which causes the benzine-propelled phaetone to climb walls and frighten street cars. This name hails from France, the cradle of the motor car, and hae the literal meaning of "firsman"; many persons agree that this appiles to their post-mortem vocation. To be a chauffeur is to rank among "the chosen," as the more earthiy of the ewarm will deign to inform you; wbo does the choosing may be readily imagined from the reverent expietives in common use among the ieather-clad brethren.

Some few of theee reckless road-kings can lay claim to an efficient training in cushion-greasing and lamp-breaking, but the majority wear a tin breastplate labelled "License" only for the reason that Fortune turned over the required fee as the result of a good poker hand. To the uninitiated it would appear that the duties of a chauffeur would be the care and operation of the vehicle in hie charge, but in reality hie sole obligation is to accept his "salary" from that favored mortal, hie employer. When you ask what the owner has to cash up for the privilege of occupying ths left front seat, the chauffeur will haughtily aesert, ae he tucks in his paper collar, "Forty per." But to see him in his glory you must invade the evil-smelling interior of a garage, where in a far corner you may observe one of "the boye" produce an inner tube from his chariot and hand it quickly to a novice owner, receiving in exchange a substantial roll of the pea-green scrip. You may wonder if this is a practical demonstration of graft, but be wise and refrain from inquiry.

In another corner of the shop, a pair of French heels loom up under a front axle, and there is a buey "tap, tap" of a hammer and chieel upon eome bolt-head whose spanner had been sold for the price of a hop-soda. Suddenly there is a dull thud and "'mid eounde unholy" the hammer goee skimming across the concrete floor, finally taking paint from a wheel freshly painted. The eulphuroue vapor ie even woree than the richest mixture his ignorance can produce. Compared to this lurid blasphemy the vocabulary of the ecafaring tar ie but infant'e prattle. Pulling your fingers from your ears on a quiet eide etreet, you recall seeing the advertisements giving among the attainments, "three languages spoken." It is easy to realize the advantagee enjoyed by an accompliehed linguist both in the matter of alleviating pain and in frightening the refractory machine into docility.

While you ruminate upon the peculiar features of this estimable profeeeion, a big car comee up the pike with the lateet automobile raiment behind the wheel. Ae you ehrink back against a building, the flying juggernaut dashee for the curb and stops with a heaven-reaching screech one-quarter inch from the back end of a big dray. Your heart stande etill as the thing at the wheel riees and stalke toward you. His floating robes seem about to enguif you and hie goggle-eyee burn from the deviliah racing hood. It speaks: "Say, feliah, yuh ain't got a hell-stick, hev yuh?" Recovering your breath, you hand over your "iast" and watch "It" speed away—on the high gear from the etart. What a creation! Small wonder equinee refuee to ehare the road with euch evil-looking goblins. But many of the so-called "mecaniciene" require a rather extensive wardrobe to cover their ignorance of things automobile. Would that their gallantry and courtesy aleo rivalled the ancient knight.

One deiightful pastime indulged in by the gasolins fraternity causes more nervous wrecks and loss of weight than sanatariume and weighing machines can take care of. To get experience in person—or rather body—seek the busiest corner of your city, and when the traffic becomes hopelessly congested, etart for the opposite sidewalk. Invariably a big dray will oppose your progress, and you turn back, but—"Honk!"—a steaming foreign radietor punchee you smartly in the ribs. Amid the picturesque reprimande of the chauffeur, you weakly drag your trembling limbs to the sidewalk. It avails naught to glare and curse at the receding auto. Be satisfied you are not "pinched" for marring that expensive cooler—the car wae only going "twenty" anyway.

The curse of the American highway! Prison stripes for 'em all! Sour grapee? Rot! Why, you wouldn't be claseed in that "Auto School" your eye hae caught an "ad." of in the paper you're waving about. "$300 a month guaranteed. Latest French models." Oh, possibly there are a few decent men at the business, and even if there are none, you carefully cut out the advertisement as a means to uplifting the profeeeion. L. D. F.

Auburn, N. Y.

KENTUCKY WANTS TO SEE THE GLIDDEN TOUR.

Editor THE AUTOMOBILE:

[1,620.]—I am making an effort to have the next A. A. A. tour for the Glidden trophy come down into Kentucky, and it is my suggestion that the tour start from Chicago and the route include South Bend, Kokomo, Ind., Louieville, and Bardstown, visit the Abbey of Getheemani, Lincoln Memorial Farm, and Mammoth Cave, then by way of Evansville to St. Louie and to Denver. The Lincoln Memorial Farm at Hodgeville will be dedicated as a national park before the 1909 tour. Mr. Glidden writes me that it would afford him a great deal of pleasure personally to have the tour come to Kentucky. "Collier's Weekly," because of its interest in Lincoln Farm, ie also intereeting iteelf in having Kentucky included in the route. CLAUDE W. WILSON.

Bardstown, Ky.

THE Autocar Company of Ardmore, Pa., has entered the field of the commercial vehicle, and has put on the market an entirely new line of cars. Fads and sensations, by the way of new models each year, have been dispensed with, and these new cars, instead of being called 1901 Autocars, will be "Type XVIII" cars, following the policy of bringing the construction to a standard manufacturing basis.

Two styles of chassis have been designed: first, with a long chassis and solid rubber tires; and, second, a shorter chassis, using pneumatic tires. The long chassis is intended for light delivery work with 2,000 pounds load capacity. This chassis can be fitted with open or closed delivery bodies or with a twelve-passenger bus body. The short chassis is intended for passenger work, and can be fitted as a town car, victoria, or station wagon body. For certain chassis of light, quick delivery work it can be fitted with a small box body.

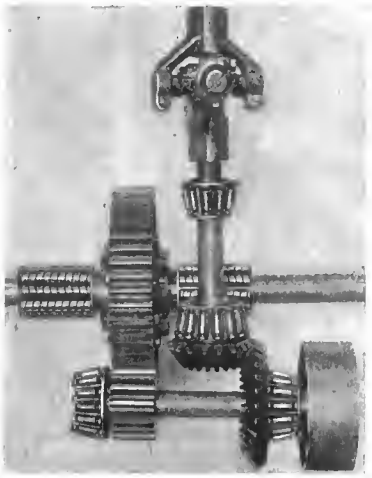
Most Commodious Bodies.—In order to get a maximum size of body on the shortest possible wheelbase, the motor is located under the driver's seat. This seat structure is separate from the body proper, and either can be removed without the other. Accessibility to the motor has not been compromised by this location. Small doors at the side of the seat provide easy access to the spark plugs and valves. The seat itself is hinged, and the whole structure may be thrown back, as shown in one of the illustrations. The motor and transmission case are mounted upon a pressed steel frame, the motor is secured by four bolts, through feet on the sides of the cylinders, and the transmission case by four bolts, through its legs. The removable power plant eliminates the necessity of spare cars in any delivery service, as an extra power plant only need be substituted while repairs are being made on the original one.

Some Power Plant Features.—The motor is of the two-cylinder opposed type, 4¼-inch bore by 4½-inch stroke, and is rated at 18-horsepower (A. L. A. M.). The cylinders are of a fine grade of grey iron, rough bored, annealed, finish bored, ground to size, and finally lapped in with pistons and rings. By means of this method of manufacture a perfect fit is assured. The valves are both on the upper side of the cylinder, and can be readily removed. They are both mechanically operated from the same camshaft and are interchangeable. The valve heads are of such shape that warping is reduced to practically zero, and that in case of a valve head cracking it cannot enter the space traversed by the piston. The pistons are of the same grade of grey iron as the cylinders, and are accurately ground to size before the lapping operation. They are fitted with three 5-16-inch piston rings, all located above the piston pin. The piston pin is hardened and ground to size, and is held in place by means of a "snub" and spring. The connecting rods are of high carbon steel, drop forged and heat treated. The piston pin and crank pin bearings are of bronze. The crank pin bearing is adjustable, the cap being held in place by means of two 9-16-inch bolts. The crankshaft is also of high carbon steel, drop forged and heat treated. All journals are accurately ground to size. The crankshaft is mounted on extra large Hess-Bright ball bearings of the silent type, and carries two flywheels, one on each end. The front flywheel has fan blades cast in it. In the long chassis this flywheel carries a throttle governor which limits the speed of the motor to 1,300 R. P. M. The rear flywheel carries the clutch.

Showing the Accessibility of the Autocar Power Plant.

The crankcase is split horizontally into two parts. The lower part carries the cylinders, crankshaft, water pump, and camshaft, while the upper part carries the push rods and guides, the magneto, the oiler, and a gear for driving the water pump. This part of the case is easily removable, carrying its parts with it, and giving access to the crank pin bearing, without dismantling the motor. The magneto is standard equipment, and is attached to the top of the crankcase by

means of two winged holts. It can he removed and replaced without altering the timing. This magneto is of the low tension type, delivering its current to an induction coil, mounted on the side of the seat structure. Thus, a dual system of ignition is provided. The oiler is of the force feed type, and delivers the oil, through a sight feed, to the crankcase, whence the cylinders, camshaft, crank pins, etc., are lubricated hy splash. The oiler is hcld in place hy a single winged holt and dowel pins, secure, and at the same time easily removable.



Rear Axle Double Gear Reduction, and Roller Bearings.

A Very Satisfactory Transmission.—The clutch is of hronze, floating ring provided with cork inserts. The forward end of the clutch shaft is centered in a bearing in the rear end of the crankshaft. The transmission is of the progressive sliding gear type. The countershaft is located below the main shaft; all shafts rotating on Timken roller bearings. The case itself is cast in one piece, with two hand-hole openings. The hand-hole opening permits the adjustment of the gear shift fork. The sliding train operates on the squared main shaft, and provides three forward speeds and one reverse, high speed, direct drive, through the transmission.

The power is transmitted from the gear case to the rear axle through two universal joints and a drive shaft. The rear axle contains a douhle gear reduction. The bevel pinion, connected at the end of the drive shaft, drives a large bevel gear on a short transverse jackshaft. From this shaft the drive is transmitted to the differential housing by means of a pair of large spur gears. The bevel pinion shaft and jackshaft run on Timken roller bearings, which are mounted in caps, screwed into the axle housing. One of the jackshafts extends through this housing and has the emergency brake drum mounted on it.

Axles, Wheels and Control.—The live axles are heavy, and are provided with squared ends. The square on the inner end slips into the differential gear, and it, on the other end, drives the wheel which is secured to it. These axles are mounted on Hyatt roller bearings, at their inner ends, and on Timken roller hearings, at their outer ends. The thrust of the wheels on a curve is taken through the two axles to the Timken hearing on the inner side of the curve. The axle housing is of malleable steel throughout, and is in five pieces. The spring seats and brake supports are integral with the tubes, and no parts are riveted.

The front axle is tuhular with the Elliott type of steering knuckles. The spindles carry Timken roller hearings, on which the wheel huhs are mounted. The cross-link, connecting the two knuckles, is in front of the axle, and the steering link lies transversely across the car, connecting the steering gear arm to the knuckle arm on the opposite side. One foot pedal controls the clutch and the other the service hrakes on the hubs of the rear wheels, while the side hand levers control the gear shift and emergency brake. When the brake lever is applied the clutch is automatically released before the hrake tension is noticeable. The steering gear is of the hevel and sector type. Two short levers above the wheel control spark and throttle.

The Armored Wood Frame.—The frame is of armored wood, constructed of pressed steel channels, reinforced with wood members. The front springs are semi-elliptic, and the rear springs are full elliptic.

The wheels are of the artillery type and constructed from selected hickory. On the short chassis they are equipped with Goodyear detachable rims and 32x4 pneumatic tires, and on the long chassis with 32x3½ solid tires. The short chassis has a wheelbase of 85 inches, accommodating a hody platform 48 inches wide and 68 inches to 90 inches long if so desired. The long chassis has a wheelbase of 97 inches, accommodating a body platform of 48 inches wide and 80 inches to 100 inches long.

WINTON SECOND "UPKEEP" CONTEST BEGINS.

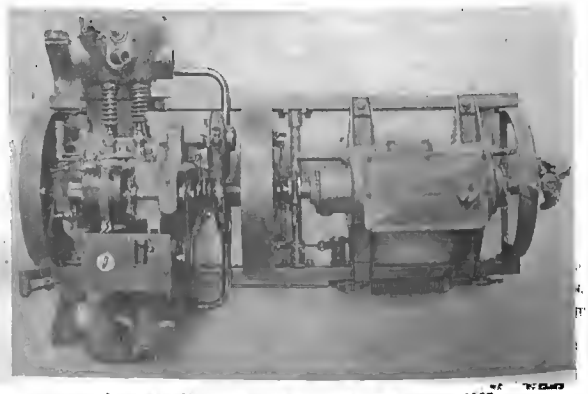
The second annual $2,500 upkeep contest for Winton "Six" chauffeurs opened November 1 and will continue to June 30, 1909. Contestants must he employed drivers of Winton Sixes, any model, and will he required to file monthly reports of mileage and expenses. At the end of the contest these reports will be passed upon by a committee of disinterested judges, who will award the cash prizes. The chauffeur making the best service record will receive $1,000. Second prize is $500, third $250, fourth $150, fifth to tenth $100 each. There is no entrance fee.

It will be recalled that the ten winners in the first annual contest drove their cars 65,687.4 miles on an upkeep expense of $15.12, an average of $1 for each 4,343 miles, or less than 25 cents for each 1,000 miles—unquestionahly a world's record.

"We are reaching the point in the automobile industry," says Mr. Winton, "where upkeep expense is of cardinal importance to buyers, and we propose to prove hy these public tests—all records open to every interested person—that Winton Sixes are the best investment the market affords. Low upkeep expense signifies more than ahsence of repair bills—it means continuous, satisfactory service, hecause the car that encounters repair bills is also a car that disappoints its owner in the character of its performances."

FAVORABLE CUSTOMS RULING ON FORGINGS.

It has taken the Board of United States General Appraisers just two years to decide that drop forgings are forgings and should be admitted as such when imported from abroad. Thomas Prosser & Son, New York agents for the Krupp firm, have been importing connecting rods, crankshafts and similar parts made hy the drop-forging process, and the government decided they were "manufactures of metal," accordingly assessing them 45 per cent., instead of 35 per cent., which is the duty on "forgings." Two years ago, a suh-hoard of appraisers reached the same decision, hut the question was then taken out of its jurisdiction and litigation extending over the interim has been necessary for the general board to determine the merits of the question of whether a piece of metal that has been die-forged is really a forging.



Autocar 18-horsepower Power Plant for 1909.

Rapid 5-Ton Truck for 1909

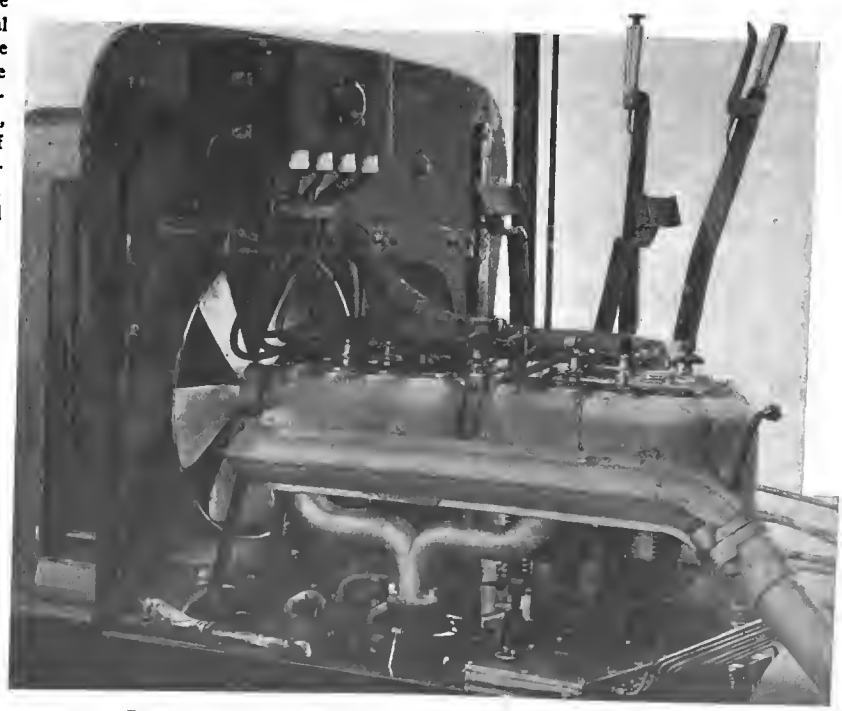
THE illustrations will show better than a word picture, the symmetry and strength present in the design of this bidder for utility favors. In commercial work, involving unskilled labor more often than not, the power plant is of the utmost importance, and in connection with this truck, an effort has been made to so perfect the several features, as to eliminate the squirt can, the screw driver and the monkey wrench.

Motor Characteristics.—The motor is of the four cylinder type, conventional four cycle, 5 1-2 x 6 1-2, bore and stroke respectively and is rated by the makers at 60 horsepower. The cylinders are cast in pairs, water cooled, with integral head and this difference, *i. e.*, the heads of the water jackets are separable. This construction permits cores to be properly centered; the complete removal of core sand, and, after cleaning, if the occasion in service should require. The pistons are long, packed with four concentric rings, with intervening oil grooves, while the cylinders and the pistons are of a special close grain iron. The crankshaft is of nickel steel, forged and "slabbed" and after profiling is machined with an allowance for grinding. For the connecting rods drop forgings are used, the same of a special grade of toughened steel, while the wrist pins are hollow, hardened and ground.

Realizing the arduousness of the service and the lack of attention the plant will be given in the ordinary run, the projected area of the respective bearings is greater than that likely to be found in other branches of service and sufficient to assure long life and the absence of annoying, if not costly, interruptions. The valves are large with special nickel steel heads and carbon steel stems in long guides. The cams are separable on a special steel camshaft and impart a silent, uniform motion. The half-time gears are separately housed, which housing in turn is packed with grease. The water circulation is by means of a gear-driven centrifugal pump, while the cooler is adequate in point of capacity to abort steaming. Lubrication is by splash with suitably devised oil ducts and troughs, assuring a slippery surface and a profusion of the oil supply at every zone of pressure. The ignition system consists of a magneto on the valve side of the motor, with an auxiliary battery and spark coil system for cranking, and if the magneto fails, which, however, is a remote contingency, there are other nice features in connection with this power plant, as for illustration, the exhaust manifold is of large diameter and separably flanged, moreover, the intake is designed with a view to a continuity of the flow of gas and is separably flanged, and we might say, before departing from the subject, that there is a certain nice symmetry about these features that extends beyond utility and pleases the eye.

Transmission System.—Beginning with the clutch, it is to note a multiple disc type, housed in the flywheel, the numerous discs submerged in oil, backed by ample surface, assures a continuity of the clutching functions. From the clutch, the propeller shaft is short, and is terminated in a universal joint at both ends. But there is no perceptible angularity of the transmission, hence the joints are required to do no more than to transmit the power and take care of mere deflections. The transmission set is of the selective type with chrome nickel steel gears, from materials by "Krupp," and an assurance of life, aside from nice material, come by way of a coarse pitch of the teeth and a wide face of the gears. Flanging is resorted to wherever possible, as for illustration, the flywheel to the crankshaft and the bevel gear to its shaft.

The truck is the product of the Rapid Motor Vehicle Compan, of Pontiac, Mich.



Power Plant of the Rapid 5-Ton Truck as Seen from the Left Side.

THE AUTOMOBILE FOR JUVENILES COMES AT LAST

A NEW company has been started at Newark, N. Y., styled the Omar Motor Company, to build the "Browniekar," a car suitable to place in the hands of youthful autoists. An inspection of the illustration showing the car, will indicate that it is a very graceful little automobile most comfortably arranged, and sufficiently racy in appearance to send a thrill of pleasure through the hearts of juvenile auto aspirants.

Motor of the Browniekar.

Besides affording a real car, with an actual power plant, and all the facilities of an automobile, the designer very cleverly kept uppermost in mind the need for simplicity, on the one hand, and safety on the other. The car is very light, hence the impact, should it collide with an obstruction, will scarcely be felt at all. The mechanism is accessibly situated, and a good deal of thought has been given the details thereof, rather with the hope that repairs will be a minimum, yet easily effected, should the occasion require.

The Power Plant Complete.—The motor, it will be noted, is of the single cylinder, vertical type. As will be noted it is of the water-cooled genera, with integral jackets, mechanically operated exhaust valves, while the inlet is automatic. Care has been exercised not to overpower the car, but rather to provide a harmonious relation of the power of the motor to the weight of the car, in view of a safe speed. The control of the speed is through spark and throttle, with a speed range from a maximum of ten miles per hour down to a minimum, dictated by necessity. The clutch is nested in the flywheel, as the illustration plainly shows, which clutch, in turn, is actuated in the usual way, through the good offices of suitably disposed foot pedals.

The Transmission and Other Features.—The speed control is by a clutch pedal, operated by the left foot. When this pedal is pushed forward it tightens a belt and drives the car in a forward direction, while, if the pressure is relieved, the belt slacks. A second pedal, operated by the right foot applies the brake during the interim of slack belt and stops the car. With the idea of illustrating something of the efficiency of the transmission, the designer of the car states: "The car will make from thirty to fifty miles on a gallon of gasoline, while a gallon of cylinder oil will serve during a period represented by from five to six hundred miles of travel."

The Body Work and Finish.—The body is of metal, roadster type, with metal mudguards, and a bonnet of the same material. The finish is what the designers style "medium red, with a black stripe." Oil, sidelights and a tail-lamp are shown, the steering wheel tilts at a rakish angle, and the general appearance is brought up to a high standard. The approximate weight of this car is some three hundred pounds, which is brought about by divers economies of design, taking advantage of the thermo-syphon system of water cooling, and such other modes of procedure as are well known to designers of skill. The builders of this car lay stress upon the particular features, viz.:

The Browniekar—An Auto for the Younger Generation.

(*a*) The "Browniekar" is an automobile possessing all the usual functions as respects power and control.

(*b*) Its perfect simplicity and harmonious relation of parts indicates economy of maintenance.

(*c*) An eye to safety in the hands of juveniles was considered *first, last, and all the time.*

NORTHWEST WANTS AND IS BUYING AUTOS FOR CASH

MINNEAPOLIS, MINN., Nov. 2.—The most noticeable thing to be heard among the dealers in this territory, is prosperity. The reason is the abundance of money in the vicinity, and the readiness of people not heretofore in the market for cars to listen to the arguments of the dealers. Judging from the recent activities of Eastern factory representatives, the Northwest will at last be accorded that recognition for which it has been fighting for several years past. The recent panic and the subsequent showing made by Minneapolis and surrounding towns seems to have caused an awakening among the Eastern manufacturers, who now seem to realize that territory with acres and acres of good wheat land working to bring in the money, with wheat a dollar a bushel, is worth of the closest attention.

Vic Syromquist, for years identified with the Packard interests in this city, has closed with the Corbin people and for the present is located on South Sixth street until his new garage building on "Motor Row" is completed. The Corbin car is fairly well known in Minneapolis, although it had not had active representation for some time. Stromquist has a roadster demonstrator and expects to be able to make early deliveries.

Kemp Brothers have closed with the Brush runabout and have begun receiving them in carload lots. This firm is also carrying on negotiations for a line of higher priced cars.

Harvey E. Haynes, brother of Mayor Haynes, besides the Welch car, has closed with the Pennsylvania people and is looking for quarters in the neighborhood of "Motor Row."

The Fawkes Auto Company, handling the Rambler and Overland, have added the American to their list and have commenced taking orders right from the start.

An evidence of the general Northwestern prosperity is the fact that the Pence Auto Company, selling the Stevens and Buick lines, have placed an order for 1,800 (eighteen hundred) cars for the coming season. This includes the runabout and buggy types of Buicks and the Stevens touring car.

USEFUL THINGS FOR THE AUTOIST TO KNOW

THE proper lubricant for the bearings of the water circulating pump is a stiff mineral grease similar to vaseline. Grease containing animal fats softens considerably under heat, and is melted by the water and carried through the circulating system. Mineral grease, on the other hand, retains its consistency up to fairly high temperatures and is also very much better adapted for this use than other grades. A good grease will frequently serve to keep the pump from leaking where the packing is no longer what it should be and tightening the gland nut is of no further avail.

Feeding Mineral Grease to Bearings.

The theory of the behavior of mineral grease when used as a bearing lubricant is essentially different from that of animal grease. The latter is applied under more or less pressure, but much reliance is placed on the fact that it softens under heat, and indeed runs like oil if the bearing is hot. Mineral grease, on the other hand, does not soften materially under like conditions, and therefore it must be fed to the bearing by steady pressure; preferably by a spring grease cup. As there is obviously a limit to the distance the grease cup will transmit its pressure along the shaft, it follows that the shaft should not extend more than 3 or 4 inches either way from the grease cup, unless it receives an additional supply of lubricant from another grease cup, or from oil, as is the case with some gear shaft bearings. Whether a bearing be lubricated by grease or oil there should be opportunity at each end of the bearing for "stale" lubricant to escape. The same principle applies to a long shaft bearing fed with grease from cups located some inches apart. In other words, an outlet should be provided for the grease midway between the two cups as well as at the ends of the bearing.

Attaching Coil to Metal Dash.

When a heavy spark coil is to be attached to a metal dash, especially an aluminum dash, it is necessary to distribute the weight of the coil over as large an area as possible. If the coil were simply bolted through the dash by four bolts these bolts probably would work loose in the aluminum in time and enlarge the holes through which they passed. In addition, the overhanging weight of the coil would tend to bulge the aluminum around the nuts belonging to the upper bolts. To make a stiff and durable job, the bolts should go through vertical strips of hard wood not less than 1-4 inch thick and 1 1-2 inches wide. These strips should go on the front of the dash and serve to distribute the pressure of the nuts and washers over a considerable area of metal. It may be necessary to have the same strips extend above and below the coil and have additional bolts put through their ends. In that case, leather washers should be used in addition to the metal washers under the heads of the bolts.

End Play in Steering Gears.

A set screw is useless to take the end thrust of the steering worm or the worm gear, and it concentrates the pressure too much. In many steering gears, slackness due to wear is found to a much greater extent in the end play of the worm and segment than in the worm teeth themselves. The only way to make a durable job in taking up end play is to use hard steel washers or discs as large as possible, and provide passages for oil or grease to work across their surfaces. If it were not for the difficulty of cutting it to shape, the blade of an old saw would make excellent thrust washers for this purpose.

Induction in Spark Plug Cables.

Irregular firing, which persists in spite of the utmost care in insulating the circuit and making perfect connections, is sometimes traceable to mutual induction between the spark plug cables, when the latter are several feet long and run side by side close together. The sparks from such induced currents may be as much as 1-8-inch long, and when the mixture is just right it may be ignited by such a spark near the end of the suction stroke. Misfiring of this nature is infinitely more puzzling and demoralizing than that due to simple failure of the spark. It does not always occur when the plug cables run parallel, but appears to be more marked with battery than with magneto ignition, though this statement may need to be qualified. It is also more marked with certain mixtures than others. The remedy is simply to run the cables at least an inch apart. In this connection it may be remarked than when the current supply is small trouble may be experienced with long cables owing to their static electrical capacity, by virtue of which they must first be electrically charged before they will deliver a spark at the plug. A cable may be so large and long as to absorb the whole charge and deliver no spark at all. A third possible source of loss in efficiency is unnecessarily large or sharp pointed metal objects in the high tension circuit, such for example as large binding posts, wing nuts and stray ends of wire. A high tension charge tends to escape into the air from any sharp metal point in its circuit, and objects such as binding posts absorb the charge on their surface exactly as a long cable does.

Starting in Cold Weather.

A handy kink for starting in cold weather, which is less known than it deserves to be, is to warm the cylinders by squirting gasoline into them and firing it with a match at the compression cocks. A few drops of gasoline in each cylinder is all that is necessary, and the match is held to each open compression cock in turn. The resulting small explosion imparts just enough heat to the walls so that, after the crank has been turned twice to expel the burnt gases, fresh injections of gasoline will evaporate and ignite at once on turning the crank. Obviously, before resorting to this device, one should make sure that there is no stray gasoline vapor about, such as might be due to excessive and fruitless priming of the carbureter, as this would be quite apt to lead to unlooked for and somewhat disastrous consequences, and the driver who does not regard the presence of oil and gasoline splashed over the motor promiscuously had better taboo this expedient. Lubricating oil absorbs gasoline to a certain extent and is then more inflammable.

Starting in Snow or Soft Earth.

Certain materials, such as snow or soft earth, sink under the wheels when the car stands for some time, and it is difficult to climb the minute but steep gradient thus created. A steam car can very easily be extricated from such a position simply by see-sawing it back and forth, going a little further each time until the "grade" has been so eased off that it is easily surmounted. This trick is simple with a steam car because the throttle can be left open and the reversing lever rocked back and forth. With dexterity, however, a gasoline car having planetary drive, and suitable arrangement of control levers, could be manipulated in much the same way; and with a very easy gear change and gentle clutch it might even be possible with standard sliding gear transmission.

A Possible Cause of Carbureter Flooding.

A possible, but seldom thought of, cause of carbureter flooding is the float striking the top of the float chamber before the float valve closes. This might happen from defective design, from a drop of solder added to the top of the float to raise the gasoline level, or from some accidental cause such as wear of the float valve needle. If the float valve levers reach the limit of their movement before the float valve closes the same effect will be produced. The only sure test for this is to expose the top of the float or the float needle and feel of the needle to see whether or not it is seated. If it appears to be seated, feel of the float and the float levers to see if they have a little further movement.

A Hold-Up in France

By Francis Milfoun-

THERE are no police traps in France. But there are various kinds of *contraventions* to which you may be an unknowing party. French law presumes one guilty—whether it is for maiming of a murder or the scratching in the crazy chicken middle of the road—until he proves his innocence. The perhaps innocent victim has no chance if he gets the least rattled, or is not a good witness in his own behalf.

The automobilist who makes a *contravention* in France may not be aware of it for six weeks, when finally a local *commissaire* hunts him up and bands him a paper (and takes his receipt for it, too) saying that at a certain time, a month or more back, a hundred, two hundred, or five hundred kilometres from where you now are, you smashed into a rush bottom chair which some imbecile left in the road by the curb; the chair fell over into a basket of eggs; the eggs were broken and now it is a question of your proving that it wasn't you at all who did the thing, but an automobile bearing another number registered in a department away across France. These *facts* count for nothing in the present stage of the game; you must see it through.

Even to a cock-sure gendarme, 837 M looks amazingly like 384 W, even when it comes to making oath on it. And the proof is up to you to prove that your automobile was in the repair shop at the time awaiting a new valve seating, which the factory wanted two months to supply, it being an ancient model and they being so busy thinking up more changes in design, which they can spring on an unsuspecting purchaser next year and so cause more annoyance of the same kind. There is one factory in France which, with only eight models manufactured to date, carries a stock of something like a million *pièces de réchange*, and the writer knows of another who in half a dozen years has put out a score of models and never has a piece that will fit any but the latest in stock. For the moment we assume that your car was one of the former (the writer knows, he had one of the same breed once), but the *judge de paix* knows nothing of this, and a sixty-cent-a-day gendarme is to him more worthy of belief than you who pay as many dollars a year into the French exchequers as taxes, even though you are a foreigner.

Again, you may get hauled up on the spot—if, for instance, you butt into a donkey and its cart, turning about in the middle of the street at its master's call from the opposite curb. This is a repetition of an incident which once occurred to the writer. In fluent, if not grammatical French attention was called to all and sundry to the true fact (a photographic film was exposed, even in order to have a silent witness, one that would tell no more than it was asked to tell), but no good came of it. A gendarme strolled by, haled you off to his brigadier at the Gendarmerie, and a *procés verbal* followed as a matter of course.

No, there are no police traps in France, but you get badly stung every time you have anything to do with those high-salaried gendarmes nevertheless. The gendarme of the average country town in France, of five thousand or more inhabitants, has a jolly time of it every Sunday morning. He saunters out spick and span, as proud as a peacock, takes his stand on a busy corner, and watches out. He picks out some poor unfortunate automobilist who stops to ask his way and demands to see his *"papiers"* (you must have them on your person, always, in France). He would like to have a look at your *Certificat de Capacité* and the receipt for your last taxes, if you please. Of course, you do please, and if you have not forgotten them and left them in the trunk which you sent ahead by *petite vitesse* you show them to him. If you have them all, well and good; if you haven't, why, *procés verbal;* the mere fact of the confection of which will cost you a franc, even if you are proved not guilty. Red tape is costly in France as elsewhere once it begins to unwind.

If you are a stranger from abroad, stopping by the roadside to admire the scenery, perhaps to spend some of the money you have brought with you for gasoline or oil, or perhaps even food and drink—all for the benefit of the native shop and hotel keeper—the case for the gendarme is not far different. All automobilists look alike to him in great coat and goggles. When he actually discovers you are a stranger in a strange land, he thinks he can frighten you in earnest. He is not a grafter, though, the gendarme in France, there is that to his credit. He is not like the up-State constable in New York or the Kent and Surrey bobbies of Britain, but his brigadier sends him out periodically to make what captures he can, just so that the record book of the "Maréchal de Logis" shall not remain a beautiful blank. Promotion in the gendarmerie depends upon activity, not upon efficiency.

If the stranger automobilist in France has provided himself with his "Carte Rouge and his "Carte Gris" and has his *numero* well displayed he has nothing to fear. But he must not talk back to the white-braided man of the law; this of itself is a punishable offense. The gendarme in France is, in one respect, like his American and English brothers. He seldom if ever has had personal experience of automobiles, and he is no judge of speed. He can be educated by being given a ride once and again. The writer has done this in several instances in various parts of France, and it is the same old story over again. When you are doing about your prettiest without racking your motor to pieces he immediately wants to know if that is as fast as it can go, and he is as wrathful as you are at a donkey cart which gets out of the way only too slowly. He invariably says hens and chickens and geese and dogs and sheep (except when the latter are going from one pasture to another) have no rights on the road, and you can run over them if you like for all he cares. This is what he says when he is riding beside you, but professional dignity prompts him to take another view if some peasant takes exception to your having decimated a scrawny hen of which he is the owner. As for hold ups for speeding, there are very few of these in France; they exist here and there and for more or less temporary periods, but in general, so far as the open country is concerned, you may make what speed you like so long as you don't run into somebody or something. Then, look out, *procés verbal* this time sure!

PACKARD IN PARIS IN LARGER QUARTERS.

PARIS, Oct. 25.—Present quarters proving altogether inadequate for growing needs, the Packard Paris branch called in the removal men this week and transferred their establishment from the Cité de Pusy to 177 Boulevard Pereire, further in the automobile district and more easily accessible from the central part of the city. H. D. Wilson, the Paris agent of the Packard Motor Car Company, reports that the number of cars of their manufacture visiting Europe this year is larger than ever before.

Though requests for repairs are always light, it was considered necessary by reason of the number of callers for information and assistance to seek more suitable quarters. The only reason for founding the Paris house was to be of assistance to Packard tourists in Europe; thus at the new establishment a complete stock of parts is maintained in readiness for shipment at a moment's notice, and a repair shop is at the disposition of those who may need it. The increasing number of Packard cars which traverse the Atlantic each year and undertake trips of several months' duration through Europe substantiate the claims which are made for the company's product.

Autoing Conditions in Buenos Aires

By Sigmund Krausz

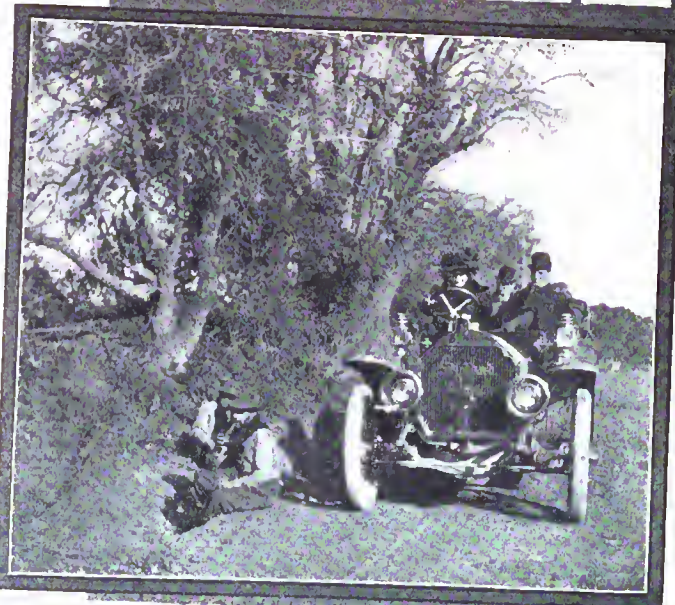
T takes patience and *savoir faire* to get an automobile out of the custom house in the capital of the Argentine Republic. Why it should be so is quite inexplicable, for there have arrived here a goodly number of automobiles. But everything down here seems to be arranged in a manner to benefit the "despatchandos," as the customs brokers are called, and the host of graft-seeking custom house employees who are in a position to be arbitrary. However, this condition is not different from that of the other South American countries I have visited so far, and one gets, by and by, used to the system.

Before speaking of automobile matters in general, I would like to advise other Americans coming down here, either for the purpose of establishing business connections or for pleasure autoing, to be even more careful in the matter of selecting garage accommodations than is necessary in Uruguay or Brazil. The city is full of dealers and chauffeurs interested in the proportion of foreign cars, and, unless you take the greatest precautions, the owner of an American automobile will soon find his automobile cutting the most extraordinary capers—if it remains in a condition to cut capers at all. I cannot make any direct accusations, but since the fact absolutely exists that American cars returned in first-class condition to garages after an afternoon's run have been found next morning "on the bum," and that if a repair is really needed it takes an eternity to have it done, one may draw his own conclusions.

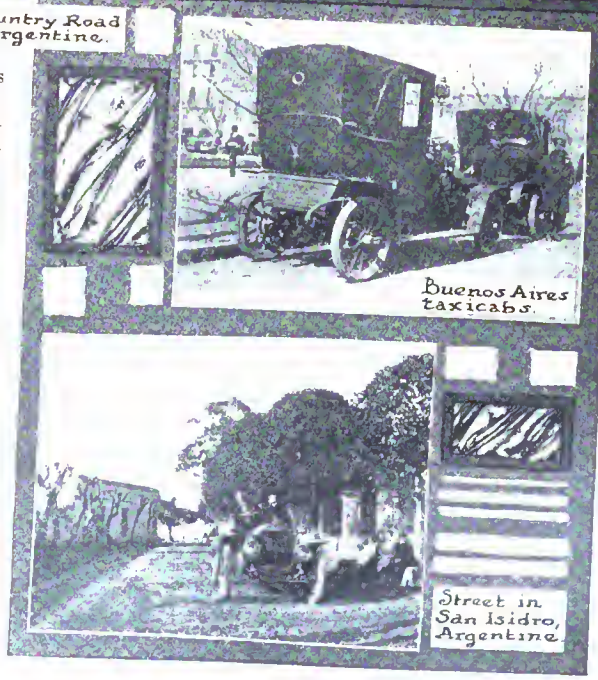
These facts were admitted to me by the owner of the garage where I keep my car, and I have made him—as a condition *sine qua non*—responsible for any inexplicable mishaps while the machine is in his place. Withal, I have also taken the precaution of hiring a compartment which can be locked, and am also careful enough to secure the safety of the motor by fastening on the hood by means of padlocks. Thanks to these precautions, my Stoddard-Dayton is performing in Buenos Aires with its usual reliability.

There is another thing to which I would like to call the attention of such American manufacturers who have a well-known car and wish to introduce it in the South American market, especially in Argentine. It is the matter of registering the name or trademark under which a car is sold. Without this precaution it may happen—as lately two American concerns have learned at their expense—that they see themselves in a position where they cannot sell their own product in Argentine without coming to an understanding with some blackmailer, who has registered either or both of them in his own name. There is a law that will protect the rightful owner of a name or trademark, unless he registers them before working. Since the cost is great, one may save a lot of trouble by the procedure. The protection is good for ten years and may be renewed.

Park of Palermo, Buenos Aires.



A Country Road in Argentine.



Buenos Aires taxicabs.

Street in San Isidro, Argentine.

Autoing the Rage in Argentina's Capital

Buenos Aires has seen within the last two or three years a remarkable growth of the auto fad, but the financial stringency of the last half year or so has put a considerable damper on the enthusiasm. There are at present, according to various estimates, from 1,000 to 3,000 automobiles in the city. The latter number is evidently much exaggerated, but it is quite safe to put the number down at about $1,500. Many of these, however,

are out of running on account of economic restrictions and the disgust of owners with the irresponsible and rascally class of chauffeurs which predominate. There are very few Argentinians who take the trouble to learn anything about the construction of their machines, or even to drive them, and, consequently, they are entirely at the mercy of any chauffeur who is in league with garages and repair shops. An Argentinian rarely buys a car for the love of sport, but simply for show. If his friend or neighbor has a fine car, he must, of course, if he can afford it, have a finer one. This is the reason why one sees such a large number of luxurious limousines and landaulets of the best makes in the streets, and they are, sometimes, of a horsepower entirely out of proportion with the requirements of the local topography.

The city is absolutely flat; the streets, though narrow, are well paved and touring in the country is, on account of the lack of roads or their abominable condition, largely out of question. These conditions may improve in time, but it will take considerable time, for *"manana"* is here the word, as well as in other parts of South America, even if not to the full sense of its meaning in Brazil.

Club Life and the Roads in the Vicinity.

There is an automobile club here, but it does not seem to be very active and confines its efforts principally to the promotion of social functions. The Touring Club of Buenos Aires, on the other hand, is somewhat more energetic in the way of furthering the question of road improvements. At the present time there are but few roads on which one may venture for some distance out of Buenos Aires, the best of these being the one leading to a resort called Tigre. It is of about 25 miles length, but the latter part of it, the stretch after San Fernando, is not exactly what one would call a good, or even a fair automobile road. Going in the Tigre direction one comes, after leaving Belgrano, over a five kilometer stretch of fine macadam road. This is a road specially constructed for the use of automobiles. It is about 20 feet wide, is fenced in with barbed wire, and is about the only place where one can speed with some safety.

There is talk just now of arranging a race, but unless it be a steeplechase or an endurance run, I cannot see where such an event could be held. Three horse race courses provide sufficiently for hyppic sport in the Argentine capital, but conditions for an automobile race of some importance are as yet in the embryo.

It is a pretty sight, especially of a Sunday, to see the long lines of fine autos out in the park of Palermo. There the fashionable world gives itself rendezvous, and while the private and livery carriages outnumber by far the autos, the latter are certainly there by the hundreds. The aspect reminds one forcibly of the Bois de Boulogne in Paris, and when the lines drive back to the city between 5 and 6 o'clock in the evening the Avenida Alvear is almost as crowded with vehicles as is the Avenue des Champs Elysées at a similar hour in summer. One may see then, in letting the automobiles pass review, all the famous makes of France, Italy, Germany and England, but very, very few of American origin. I am quite proud to say, however, that my 40-45 horsepower Stoddard-Dayton touring car caused quite a sensation among the connoisseurs during the corso in Palermo. They begin to call it here, "El diablo gris" (the gray devil), and it is opening the eyes of the natives to the possible merit of American cars.

The Street Sprinkling Man is Ever Present.

Speaking of the corso in Palermo, I must mention the nuisance of sprinkling the roads and streets that lead out there. I call it a nuisance because it is overdone. You may drive out at any hour of the day, by sunshine, cloudy weather, or even after a rain, and you will find the sprinkling fiend at work with hose wagon or even sprinkling can. No wonder all motor cars in Buenos Aires are fitted with "antiderapants." and it is a pity that the horses of the city cannot be equipped with a similar contrivance. For it is not only on the wide roads running to Palermo that the sprinkling fiend is busy. No, even the asphalt-paved narrow business streets are made almost impassable for draft animals by continuous watering, and on all sides one may see horses slip and fall down.

While I feel compelled to mention this asinine sprinkling nuisance, I am obliged at the same time to acknowledge with gratitude the good treatment I have received at the hands of the city authorities in relation to a driving license. On producing at the "intendente's" (mayor's) office my journalistic credentials, I was quickly granted a special license for 15 days, with the privilege of renewing it for a similar period as long as I stayed in the city. I was not even given a temporary number, and I have been driving about town unmolested by the police, who do not even seem to notice the lack of a number on the car.

The municipality has, however, taken lately some drastic measures relating to the driving of cars within the city limits. The chauffeur's examinations are to be more severe than hitherto, young men under eighteen are not allowed to drive cars of higher horsepower than eighteen, and among other things acetylene lamps are forbidden at night. I mean to say, the lighting of them. This measure I regard a good one, in view of the fact that the city is well lighted. The driving is regulated by arrows on the steet corners, pointing in the direction in which traffic is to move, and since there are but few streets in the city where vehicles can move in both directions, one has to know the town pretty well in order to avoid detours.

Plenty of Good Garages and a Taxicab Service.

There are a large number of livery garages here and several companies have auto taxicabs for hire on the streets. All these are of a collapsible landaulet type and of French manufacture. At this time of the year—it is winter now down here—they circulate with closed bodies. In this connection, I cannot refrain from mentioning the curious fact that horse-driven passenger vehicles for hire on the stands must be of the open kind. No hansoms, closed cabs or carriages are allowed, and no matter how the weather is—sometimes it gets deucedly cold here—the passenger has to face the biting pampero winds in an unprotected vehicle. There are no lap robes, either, furnished by the Buenos Aires cabby, who, by the way, is a far better man in his line than his chauffeur brother.

In order to secure adequate legislation, to improve the general character of chauffeur's and mechanic's service, and to promote the interests of dealers and garage proprietors, the "Sociedad Union Commercial de Automoviles" has lately been formed by a combination of importers, livery garage owners and accessory dealers, which promises to become an important factor in the automobile business of Buenos Aires. This association also has the sympathy and support of all private owners, and it is hoped that the object desired will be achieved. As it is, the business is certainly demoralized here and needs some energetic measures and unity of purpose to bring it back to normal state.

Ware Switzerland is the advice of A. A. Anderson, an American, who is taking the cure at Ragaz with his wife, gives his compatriots, and it seems that he really has cause to say the same. He set out with Mrs. Anderson for Zurich and thereby exceeded the terrible pace of six kilometers an hour, the limit set. This he does not deny, and, in fact, it would be difficult for anyone to keep within its bounds. At any rate, he was caught, and at Mels he had to deposit a sum of 100 francs. At Flums, after the wires had played, he was brought before the judge, and, after a long discussion, he had to pay a fine of 45 francs, the remainder of the sum being returned to him. It was while here that the incidents occurred of which Mr. Anderson so justly complains, for, during the many hours of waiting, both he and his wife were gravely insulted and even set upon by the population.

HOW THE INTERNATIONAL RULES WERE ADOPTED

PARIS, Oct. 25.—Next year's international racing cars must ıot exceed 130 millimeters (4.26 nches) bore for four cylinlers, and nust weigh not less than 900 kilos ,984 pounds). Six cylinder enines will be allowed a bore of 106 ıillimeters, and the same minimum eight of 900 kilos. Motors of the ıobron type, two pistons per cylıder, will be admitted. These desions being arrived at by the Inrnational Association of Recogzed Automobile Clubs, will be in gue for all the great speed consts of 1909, including the Grand ize of America, and, if Britain cides to hold another speed con-t, for that country also.

When the meeting opened with egates present from France, rmany, America, England, Belm, Italy, Switzerland, Spain, stria, Hungary, Portugal and pt, it was rapidly agreed to that method of regulation should be limitation of bore. England ıe held aloof declaring that er, and not bore should be limited. French delegates had ructions to insist on a maximum bore of 140 millimeters; , Germany and Belgium were known to be strongly in-d towards a mixiumum bore of 130 millimeters, on the nd that engines of this size would furnish an average speed o miles an hour, which was quite sufficient for the public. French objection to a very small bore appeared to be that greater the limitation the greater the departure from comial models, or from models giving experience for everyuse.

ere was a long fight before a common meeting ground could rived at, France finally abandoning its bore of 140 in favor o, but maintaining its minimum weight of 900 kilos. Ger- held for 130 bore and 1,000 kilos weight, and Italy tried concile all parties by 135 millimeters and 900 kilos. On a being taken the French proposition was adopted, Germany taly abstaining. America did not figure in the discussions, he ideas of France seemed most satisfactory to its delegates. der the new regulation, which will be the international law 909, no race—other than a local event—can be held with having other than 130 millimeters bore and a maximum t of 900 kilos empty. The cars will be lower powered hose of the present season, when the 155 millimeters rule force, but it is doubtful if they will be much slower. At na, last month, where a 130 millimeter race was held, the averaged 65 miles an hour with a bore of 120 and a of 1,200 kilos, while several faster, but less regular cars, d over 90 miles an hour on a straightaway. Speed, therevill be high, despite the drop from 155 to 130.

Tire Trouble Should Be Less.

eason of the lower minimum weight it may be expected re trouble will be considerably less than at any of the ng international races, where the cars have always been limit of their pneumatics. The question of rims and tires p for discussion at the conference, the Marquis de Dion ınce and Mervyn O'Gorman for England asking that disble rims should be forbidden, in order to force tire manus to improve their product. The bandishment of rims would, of course, entail the abandonment of dismountable wheels that England has been asking for during the past two years. René de Knyff was inclined to favor the ban on quick changing devices, but would not pronounce definitely until he had consulted his colleagues of the Commission Sportive. Finally it was decided to hold over the question until the next meeting, to be held November 30, during the Paris Solon.

Picturesque Setting of a French Race.

After hanging fire for two years the Gobron question was forced on the meeting and a decision arrived at in favor of multiple piston engines. Under the old Gordon Bennett rules the Gobron motor was, of course, admitted. When, for 1906, it was decided to limit bore the regulation was so worded that it was practically impossible for the Gobron engine, with two pistons per cylinder, to compete. Last year the same attitude was persisted in; this year, however, a strong stand was made, and the conference finally decided to allow the Gobron, with its two pistons per cylinder, to compete on the same footing as engines of the usual type. This decision finds general approval.

Small Cars Interested France Alone.

The voiturette regulations were quickly settled, this matter being of important interest to France alone. For single cylinder engines a maximum bore of 100 millimeters was maintained; two cylinders were given 80 millimeters, and four cylinders allowed 65 millimeters. Instead of 600 kilos minimum weight an increase was made to 800 kilos (1,763 pounds).

It had been decided by the International Road Congress to limit road signals to four only. The German club, therefore, brought forward a similar proposition and submitted the signals that it considered most suitable, these to be adopted as far as possble by all nations. In view of negotiations now carried on by the Touring Club of France and the Association Générale Automobile, the question was postponed until the November meeting. An attempt to arrive at a formula for touring cars was also postponed, and the British proposition to revive the Gordon Bennett conditions met with a firm refusal. Norway made application to be admitted into the international conference and was welcomed.

Chateau Country Is Favored.

An official decision regarding the Anjou course for next year's French Grand Prix may be expected this week. Indications are that the set of roads in the Château country will be adopted, but it is not yet known exactly how the course will be laid out. As the result of the reduction of bore a larger entry than usual is possible for the Grand Prix, and if, as is already proposed, the Automobile Club of France decides to reduce entry fees to $800 per car, $1,800 for a team of three, and to offer handsome cash prizes from 80 to 100 starters can be counted on. Such a number of cars would necessitate either a larger course or an elimination race. It will therefore be necessary to arrive at a definite conclusion regarding the race before selecting the roads. Chateauland would be a most inviting place to attract visitors from other countries.

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THAT INTERNATIONAL ROADS CONGRESS.

Apparently there was one most unfortunate defect in the recent International Roads Congress instituted by the French Government and participated in by delegates from 29 countries, including the United States, France, Great Britain, and Germany, the four countries wherein the automobile has its greatest usage.

Talk there was aplenty, and much of it contained the oft-repeated charge that the automobile is "destroying the roads." There was no automobilist present to make suitable reply, and as far as the congress is concerned, the motor-driven vehicle stands more or less convicted as being guilty of destroying the highways. If travel over a given length of road is increased many fold by any type of vehicle, it is a simple case of addition that it will wear out that many times the sooner. It is a question of multiplied traffic that the roadmakers are called upon to answer, and it is their plain problem to bring the highways up to date and meet conditions that have arisen.

In this direction the Paris congress made slight, if any, progress, and the deductions of those present were confined to meager generalizations of practical value, at least for the moment, and until they develop into something more definite. The ideal road was the subject on which there seemed to be some differences of opinion, the adaptation of highways to modern conditions of locomotion remaining an unsolved problem as far as the first International Roads Congress is concerned. The effect of this new traffic was considerably enlarged upon, but as to the exact manner of providing something which would better withstand the greater use of the highways, the offerings were rather sparse and unsatisfactory, though it was generally recognized that something is absolutely demanded in the future, at least upon main traveled roads.

Before the next congress takes place it is reasonable to suppose that the roadmakers will have gained experience sufficient to enable them to recommend an up-to-date form of highway construction which will adequately meet the demands of motor-driven traffic, the growth of which is certain to be enormous within the next twelvemonth, for ultimately it will supplant all other forms of individual and commercial transport. That this will come at an earlier date than many believe is presaged by the gradually growing interest of the farmer and the sale of many cars to country dwellers.

In a touring article contained in this issue will be found some most interesting information concerning the increase of roads building in our Southern States, and explaining why it is bound to become even more general. Not as plentifully supplied with railroads as the Northern States, the South is finding the automobile a most available vehicle for abridging distances. But roads are a necessity, not a luxury.

* * *

PRICE OUTLOOK FOR SEASON OF 1909.

Predictions as to price reductions in the automobile field have been rife for a number of years past—in fact ever since the automobile became a practical machine, and every year since then the realization has been eagerly looked forward to by that portion of the public which has ambitions to enter the ranks, but is prevented from financial considerations. In the abstract, this demand has been for "a good four-cylinder machine at a medium price," and since it was first voiced—a time when there were few if any cars having a four-cylinder motor that listed under $3,000—the figure has gradually been receding. That is, up to last Summer, when the moment for the announcement of a shrinkage that can hardly be termed gradual, appears to have arrived.

Of course, the plans for the production of a machine embodying the usual standard features at a price far below what anything of the kind had ever been offered for hitherto, were in preparation for some time, and their culmination naturally precipitated the announcements of others who were preparing to enter the same field. Just what effect these cuts would have on the policy of makers specializing on low-priced cars was somewhat problematical at the time, but developments during the quarter intervening would seem to indicate that efforts to compete have been more along the line of an improved machine at the same, or a slightly lesser figure than formerly, rather than a wholesale cut merely to meet competition. This is a gratifying tendency that speaks volumes for the healthy condition of the industry, as any other course could only be detrimental, both to the participants and business generally. Prices for 1909 will not only be lower than ever before, but the automobile will likewise represent more for its cost than was ever before possible.

MOTOR PARKWAY RACING CLUB FORMING.

Preparations are under way for the formation of a racing club conduct contests on the Long Island Motor Parkway. The A. A.-A. C. A. peace agreement, it will be remembered, proed that future Vanderbilt Cup and Grand Prize races should run by such an organization.

Arrangements are being made by the Long Island Motor Parky officials for a series of sprint races over the cement stretch, be held Saturday, December 5.

Cars which competed in the Long Island Motor Parkway eepstakes (for cars selling above $4,001) on October 10, those the Vanderbilt Cup race, and cars which are to compete in Grand Prize race in Savannah on November 26, are eligible.

LOCOMOBILE WINS LOS ANGELES 24-HOUR.

Los Angeles, Cal., Nov. 2.—The first 24-hour race ever run the Pacific Coast proved a huge success, no one being injured l the contest being remarkable for the showing made by the es. Seven cars contested, and their total mileage was 3662 les at racing speed, yet only five tire changes were reported. e race was won by a Locomobile, driven by Murray Page, ich covered 921 miles, Page sticking to the wheel 21 hours. J. Leavitt, the 280-pound representative of the Locomobile e, drove the remaining 3 hours. Second to the Locomobile s the Franklin six, with 836 miles. The Studebaker had 628, l tbe Reo 474. The Chalmers-Detroit Bluebird, Pope-Hartford, l Sunset retired before the finish, the Sunset going through fence Sunday night.

A PAIR OF MAXWELL GLOBE GIRDLERS.

Mr. and Mrs. H. A. Hover, of Hover, Washington, reached w York last week, having completed in their 20-horsepower axwell touring car a run across the continent, the first stage what is planned to be the longest automobile journey ever dertaken by amateurs.

Since April 11 they have journeyed from Tiajuara, a small vile on the Pacific coast, in their 20-horsepower Maxwell touring . From that point they have crossed California, Washington, gon, Idaho, Wyoming, Colorado, Nebraska, Iowa, Illinois, iana, Ohio, and New York, and have visited Niagara Falls, ada, thus accomplishing what is believed to be the first feat crossing the United States from south to north and from east west in a vehicle of any kind driven over the public roads.

he travelers will shortly sail for Algiers with their car and d the approaching Winter in touring Algeria, Tunis, and pt, penetrating the Sahara Desert at least to Biskra. Crossto Italy in the Spring, the next three years will be devoted rossing every country in Europe, at least one way, with some ing in Western Siberia.

the Winter of 1911 the homeward trip will be begun by sing from Turkey into Palestine, where the car will be m to Jerusalem and back to the coast, then taken to India. a and Japan, the Philippines, Australia, New Zealand and aii, autoing in each as much as is feasible. From Hawaii will sail for San Francisco in the Winter of 1912, and they ct to have covered on their way more than 75,000 miles, of the journey in districts where an automobile has never seen.

FISK TIRES IN THE VANDERBILT.

r THE AUTOMOBILE.

our issue of October 29, under the title, "Story of the Tires," sire to correct the statement with reference to the Fisk n the Knox cars. The 50-horsepower car, driven by Denison, d only one tire on the left front, this change being necessary count of puncture, while the 40-horsepower car, driven by ue, changed two rear tires from non-skids to flat-treads, as rticle states, but these were the only changes made, and d no trouble with the front tires and finished on the same hat he started on.

THE FISK RUBBER COMPANY.
C. H. Gage.

opee Falls, Mass.

ABOUT A DASH FROM MICHIGAN TO MAINE.

Bangor, Me., Nov. 3.—With the arrival here of the appropriately dubbed "Jackson Mud Hen," which left Jackson, Mich., October 27, in charge of E. P. Blake and Charles G. Percival, there was brought to a close one of the most strenuous runs that the new light cars have recently been put to. The car is the new Jackson four-cylinder model listing at $1,600, or as the makers term it, their "dollar-a-pound-car." Mr. Blake is the owner of the car, as well as the eastern representative of the Jackson company, and in addition to affording a test of the car's endurance and speed, the autoists carried a message from Mayor Glasgow, of Jackson, Mich., to Mayor Woodman, of Bangor. The start from Jackson was made at most unpropitious time, making the trip right from Detroit, through Buffalo and Rochester, a plough through the mud, the amount plastered over the car upon its arrival at the last-named place earning it the above sobriquet. Up to that time, the only difficulties encountered had been lack of fuel, which always happened at inopportune times, a rural apothecary in Elyria being aroused at an early hour for a supply of alcohol, which was the only thing to be had.

While entering the garage at Rochester for a fresh supply of gasoline, a trolley car hit the machine, breaking its rear axle and fracturing two of J. S. McArthur's ribs. McArthur had been

E. P. Blake and Chas. G. Percival, Who Made the Run.

acting as mechanic on the trip, and was sent back from that point, Messrs. Blake and Percival alternating at the wheel from that point on. The remainder of the route lay via Albany and the Berkshires to Boston, where the tourists arrived Saturday last. One of the most remarkable things about the trip was the utter lack of tire trouble, in spite of the strenuous driving and bad roads, the Goodyear tire and rim equipment not even having been pumped on the journey to Rochester.

CONCERNING THE GENERAL MOTOR COMPANY

Detroit, Nov. 3.—Persistent rumors are being circulated in automobile circles to the effect that the long-talked of automobile combine, which J. P. Morgan is credited with promoting, and which would be equal in its field to the United States Steel Corporation, is about to become a reality, with several Michigan concerns figuring prominently in the deal.

Among the companies mentioned in this connection are the Buick Motor Company, of Flint, and the Oldsmobile Company, located at Lansing. It is known that representatives of J. Pierpont Morgan have been in Lansing for some time quietly investigating the affairs of the Oldsmobile Company. That their report was favorable is the assertion of those who profess to know. The Buick company is also said to have come in for consideration.

As outlined by those in touch with the situation, the plan is to take over a number of the leading plants throughout the country, devote each to the production of a single model, and exert an influence not unlike that now wielded by the United States Steel Corporation.

FALL ACTIVITIES OF THE AUTOMOBILE CLUBS

NEW ORLEANS NOW HAS AN A. A. A. CLUB.

NEW ORLEANS, LA., Oct. 26.—The Crescent City has at last awakened to the fact that she has all of the advantages, both natural and otherwise, of becoming the automobile center of the South and the automobile racing center of the whole country during the winter months. The success that Savannah has had in ber automobile ventures has stirred New Orleans enthusiasts into action, and as a result the New Orleans Automobile Club has been formed. A charter membership of fifty was secured, and the following are the officers: President, Thomas C. Campbell; vice-president, Theodore Grunewald; secretary-treasurer, Homer George; board of directors, Frederick I. Thompson, chairman, Ginder Abbott, W. P. Johnson, A. M. Cook, and H. A. Testard.

The meeting was most enthusiastic, and it was decided to affiliate immediately with the American Automobile Association. The two days' racing in November of course will be sanctioned by the A. A. A.

The aim of the club is chiefly for good roads. The club will soon take up the question of signboards and warnings for autoists and also the building of a new road for automobiling and a clubhouse. A vigorous campaign for members will begin at once, tbe club having as its aim a membership of one thousand. All persons interested in good roads, whether automobile owners or not, will be urged to join. The formation of the New Orleans Automobile Club is regarded as perhaps the biggest happening in Southern automobiledom in several years. There is no doubt of the club's success. Enthusiasm in the matter bas been so well worked up that the whole town is talking about it and practically all of the prominent business men are pledging support. Besides the campaign for good roads, the club will pull off first class races during the Winter months, for which a number of big racing cars have arrived.

The New Orleans club intends to follow up its track meeting with a 250-mile road race, the first of its kind ever pulled off in this section of the country.

President Thomas C. Campbell and three members of the racing committee recently made a tour of the good roads around the city, Mr. Campbell riding on the racing car of Arthur Redfern, which will be one of the entries in the races. Redfern drove his car on stretches at a sixty mile an hour gait and shot around turns without slackening speed to any extent. The club officials were highly elated over the demonstration.

VERMONT CLUB ELECTS NEW OFFICERS.

MONTPELIER, VT., Nov. 2.—At the annual meeting of the Automobile Club of Vermont held recently at the Pavilion hotel, Montpelier, the following officers were elected for the coming year: President, W. W. Brown, Springfield; first vice-president, A. C. Whiting, Burlington; second vice-president, James M. Boutwell, Montpelier; secretary and treasurer, Lester H. Greene, Montpelier; director, C. H. Slocum, Morrisville. The attendance was the largest in the history of the organization and every indication points to a most prosperous year.

WILLIMANTIC CLUB DOING GOOD WORK.

WILLIMANTIC, CONN., Nov. 2.—As winter draws near, when most of the cars will have to be housed for a while, the fifty members of the Willimantic Automobile Club feel that they have completed a very successful season. The club has accomplished much in the way of improvement in the road conditions of this vicinity, and the new road signs will be erected before the cold weather sets in. Plans are under way for procuring club rooms, which will help materially to keep the members together preparatory to an active good roads campaign in the spring.

BLISS PRESIDENT OF MASSACHUSETTS BODY.

BOSTON, Nov. 2.—A. E. Bliss, of the Malden Automobile Club, has been elected president of the Massachusetts State Automobile Association, succeeding Elliott C. Lee, of the Bay State Association. The annual meeting of the association was held at the rooms of the Bay State Association and there was a good representation of the constituent clubs. Besides the change in the presidency there is a change in the second office, A. D. Converse of the Winchendon club becoming vice-president in place of John P. Coughlin of Worcester. J. C. Kerrison of the Bay State Association was re-elected treasurer, and the selection of the secretary was left with the president and vice-president. Secretary James Fortescue of the Bay State Association, who has served the State association as secretary for two years, positively refused to continue in the office. A. D. Converse, the new vice-president, was appointed chairman of the Legislative committee, succeeding L. R. Speare, who declined to serve longer in that position. W. H. Chase of the Wachusett club of Fitchburg was reappointed chairman of the good roads committee, and John P. Coughlin was reappointed head of the sign board committee.

MARYLANDERS OBJECT TO SPECIAL TAX.

BALTIMORE, Nov. 2.—The Automobile Club of Maryland is determined to fight to a finish the proposed special tax recommended by Governor Crothers and the State automobile commission. At the club's last meeting the following resolution was unanimously adopted:

Resolved, That the members of the Automobile Club of Maryland are willing to pay their full proportion of taxes on their automobiles in the manner proscribed by the Constitution of Maryland, but stand unequivocally opposed to any special tax upon automobilists as a class to the exclusion of the owners of other vehicles, such proposed special tax being un-American in principle and in direct conflict with our State Constitution.

The question of levying the special tax for the purpose, as the Governor explained, of improving and maintaining good roads, has stirred up the members of the club to such an extent that a canvass of every automobile owner of the State is proposed to enlist his sympathy and support in fighting legislation affecting the interests of Maryland autoists. President Rowe advocated that before the end of the year every owner of an anto in Maryland should be seen personally and have him get his friends to work with the automobilists in getting proper laws to protect the automobile industry in this State, upon the ground that unjust taxes would surely drive the automobile and its benefits from the State.

MILWAUKEE WANTS TO BE IN NEXT TOUR.

MILWAUKEE, Nov. 4.—Milwaukee wants to be included in the route of the 1909 Glidden tour, and it wants this favor badly. So every member of the Milwaukee Automobile club, agents, manufacturers and owners, will petition the manufacturers through the A. A. A. to make Milwaukee a stopping point. Secretary James T. Drought, of the M. A. C., returned from New York with the news that the A. A. A. was favorably disposed toward the plan, but the manufacturers were not, and now every effort will be made to influence the latter.

At the annual meeting of the Milwaukee Automobile Club, Dr. Louis Fuldner, president; James T. Drought, secretary, and Lee A. Dearholt were re-elected directors. On Nov. 10 the club will meet again to consider the recommendation of increasing the board of directors from nine to fifteen. At this time the old officers will no doubt be re-elected, having given such splendid service for the last few years. The annual report sbowed the club to be in the most prosperous year of its six-year history. The treasury contains $1,500, not including $1,200 annual dues to be collected early in January.

THE 1909 RAMBLER SPARE WHEEL.

A unique feature of the 1909 Rambler line just announced by Thomas B. Jeffery & Company, which will attract a great deal of attention, is the Rambler spare wheel and inflated tire. All 1909 four-cylinder Ramblers are fitted for this equipment, which consists of a wheel complete, except the hub center, on which is carried a complete tire, inflated.

The wheel is secured to the hub center by six bolts. Removing the six nuts from these bolts, the wheel can be detached by means of special tools, a wheel puller and a socket wrench. Only three minutes are required to make the change.

This spare wheel is a regular wheel in every particular. It fits on either front or rear, and it is not necessary at the end of the trip to change it. In the event of tire trouble, the injured tire can be repaired, replaced on the original wheel, inflated, and that wheel is thereafter carried as a spare wheel. Besides being a handy provision against tire trouble, an extra wheel is always valuable in case of need.

Special brackets are provided to carry the wheel and tire, and an extra charge is made for the complete equipment. The illustrations tell the story quite conclusively.

Fig. 1—3 P.M.—The start—jacking up the car.

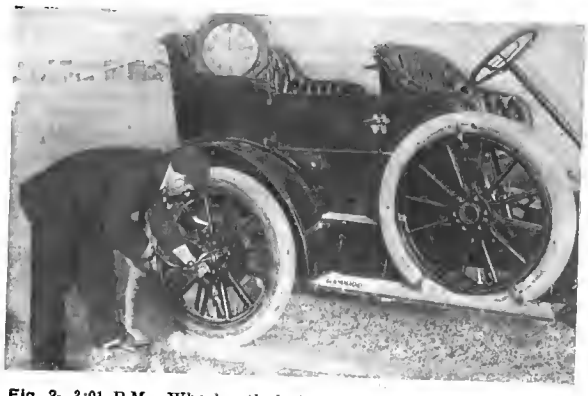


Fig. 2—3:01 P.M.—Wheel entirely loosened, ready to be taken off.

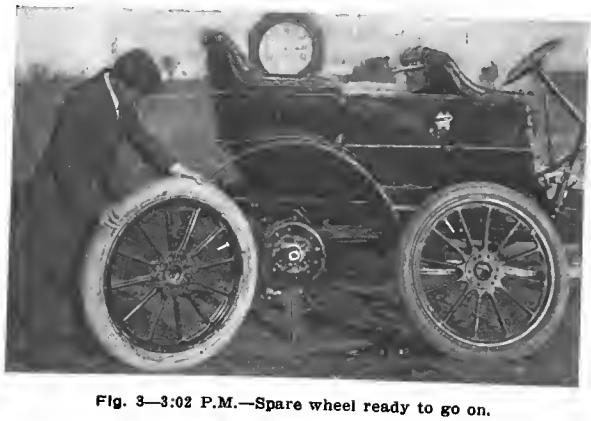


Fig. 3—3:02 P.M.—Spare wheel ready to go on.

Fig. 4—3:03 P.M.—Spare wheel with inflated tire in place.

DIAMOND TO HAVE RACING DEPARTMENT.

What may be regarded as the first practical step taken with a view to placing automobile racing in this country on the well-regulated basis, where tires and similar equipment are concerned, that has always distinguished the big establishments on the Continent, and which has doubtless been accountable in large measure for the success of foreign makers, has just been inaugurated by the Diamond Rubber Company, of Akron, O., in the shape of a racing department, which will be in charge of Joe Tracy, the well-known American driver. Speaking of this move on the company's part, one of the Diamond officials said:

"Mr. Tracy has been retained by us not only as consulting engineer on all racing equipment matters, but to have charge of a racing department we have organized which will be most complete in every respect. We are making no great predictions, but neither are we simply making a bid for increased publicity for our product. What we are doing is building up our organization so that we can take care of racing matters on a large scale. It is our present conviction that the automobile public demands the Vanderbilt and all similar big racing events."

Mr. Tracy will continue to retain his New York location, and states that he will be able to attend to other consulting commissions as in the past.

FIRE WILL NOT STOP DAYTON COMPANY.

DAYTON, O., Nov. 2.—In spite of the destructive fire which completely gutted the upper floors and badly drenched with water the lower portion of the building occupied by the Dayton Electrical Manufacturing Company on the night of October 21, the company found that enough of the undamaged stock was available for shipping to continue the business, except for the manufacturing end, just as though nothing had happened. This finished stock is sufficient to run for about six months, and in the meantime work on the new factory is being rushed to completion, so that by early Spring it will be possible to manufacture the 1910 stock.

"BEN" GOES HOME TO SELL CARS.

SYRACUSE, Nov. 2.—C. Arthur Benjamin is coming "home." He is going to sell Packard and E-M-F "30" cars, having just made Syracuse agency arrangements for these two makes. "Ben." is known from coast to coast, and he has sold automobiles of one kind or another since the beginning of the industry in this country. His latest connection was with the Aerocar Company, of Detroit. Benjamin has contracted for 150 E-M-F "30" cars, and already has disposed of one-third of them to sub-agents and has booked several retail orders in Syracuse and vicinity.

CONCERNING THE FUTURE OF THE AUTOMOBILE

By ALFRED REEVES, General Manager of the A. M. C. M. A.

"The Automobile's Future in America" is a big subject. The statistics of the past ten years are our main guidance for the future of this great industry. Many of the early figures are lacking, but it is safe for us to say that the automobile sales in 1903 were considerably less than $8,000,000, which has increased to over $105,000,000 in 1907, while this year's figures, when compiled, will show almost, if not about the same, despite the recent financial depression. During 1907 something like 52,000 cars were made and sold, and this year will supply about the same figures, although most of them are of the small type. It is estimated that the present capital of the automobile business is about $105,000,000, with an additional $36,000,000 in kindred trades, and $57,000,000 more in garages and retail salesrooms, making a total of $198,000,000. According to latest figures obtainable, there are 58,000 employees in the automobile factories in this country—about 29,000 employed indirectly in the making of parts, while there are 21,500 in the sales and garage establishments. This gives a total of more than 108,000 employees.

Number of Makers.—The records at the office of the American Motor Car Manufacturers' Association show that there are in this country 253 builders of automobiles, of which at least 123 are beyond the experimental stage, and are placing practical cars on the market. There are not less than 500 different trades involved in automobile manufacture, running from leather, varnish, broadcloth and buttons to steel, brass and rubber.

Although the importation of automobiles is fast decreasing, it is a fact that some $28,000,000 worth of foreign cars have been sold here. The trend is now going the other way, and the export trade of the American maker is increasing rapidly. It doesn't take very much of an imagination to figure that with our business methods, our unexcelled mechanics, our wonderful automatic machinery, and our perfect factory systems, America will continue its lead in motor car building, both here and abroad.

With 52,000 cars as a conservative estimate for this year it is safe to say that 175,000 automobiles have been sold here during the past eight years. They are big figures, but it is a big industry.

During the past year 13,980 cars have been registered in New York City alone, making a total registration since the law went into effect, of 63,338 cars. Above all, and of great interest to those about to enter the trade, is the fact that 9,386 new chauffeurs were registered during the current year. One cannot be a pessimist on the automobile's future in the face of such figures. What of the future of this greatest improved individual transportation of man? The past makes good reading and good history, but as matter-of-fact people we are interested in what confronts us.

Production for 1909.—Factory reports indicate a tremendous production in motor cars for next year, running from machines that range from $150 for the schoolboy to $11,000 cars for the luxury-loving and speed-fascinated millionaires. Four factories alone announce a total production of 36,000 cars, two of the leaders planning to turn out 12,000 cars each. Yet there is no reason to believe that next year will see an overproduction, provided good cars are made and sold at reasonable prices. The tremendous buying power of this country is evidenced in a score of ways, and particularly by the absorbing of motor cars during the past two years. Possibly next year's production will reach 75,000 cars. Yet we well know for the past five or six years a million buggies a year have been made and sold by the carriage people. Just what becomes of them no one has been able to say, but the buggy manufacturers continue to turn out these great quantities of horse-drawn vehicles. They are now turning their attention to motor vehicles, for the farmer is demanding the more modern type, for which he is quite ready to pay the price. One of the largest concerns of agricultural machinery plans to make 20,000 cars next year, yet this will hardly give them one apiece for their agents throughout the world.

THE AUTOMOBILE AS A WORLD-WIDE FACTOR

By E. P. CHALFANT, Assistant General Manager of A. L. A. M.

THE automobile, after all, is simply a manifestation of the forces of evolution that are working out the world's destiny, and its appearance is no more remarkable than was the advent of discoveries in other lines of endeavor.

A Vehicle of Commerce.—There can be no doubt now that the automobile is to play a permanent part in the affairs of mankind. If it had nothing else to recommend it but its time-saving and health-giving attributes, it would be a permanent institution. But it is as a vehicle of commerce that it is to figure more prominently in the future. Its commercial phases are practically unlimited. What the world wants are labor-saving devices, and the automobile is one. Manufacturing plants are hauling their product with motor cars in lieu of horses. They find the innovation an economical one from every standpoint.

Municipal Use.—Then, again, the automobile is to become a part of every well-regulated municipality. In many of the large cities of the country to-day motor cars are utilized with great success in the health and fire branches of the public service. They are found to be invaluable to hospitals, where a minute's delay sometimes means loss of life. The same can be said of the fire department, in which branch of the municipal government they have served to advantage. The Federal government, too, has become converted to their utility, and has installed motor cars in the post office service of the principal cities.

Miner and Farmer.—But it is not alone in the large cities that the labor and time-saving properties of the automobile are appreciated. In the isolated sections, far from the beaten paths, the miner and farmer have endorsed the horseless vehicle by using it. This apparent popularity of the automobile, however, is not confined to one section or nation. It is world-wide in its scope. It is as pronounced in the Orient as it is in America.

World-wide Good Roads Movement.—Automobilists in Japan are recognizing this fact, and good roads all over the Empire no doubt will soon be seen. The government should send several emissaries to Massachusetts, which State, I believe, has the finest roads in the world. That is another phase of the motor car that must not be overlooked. The good road movement is now world-wide. Its agitation was begun by the advent of the automobile, and the great benefits that are derived to-day by the construction of good roads must be credited to the motor car. In this country Ohio and Iowa possess the poorest roads. In certain seasons of the year the highways of the latter State are well-nigh impassable, the black loam apparently having no bottom.

But there is nothing unusual about this, as America, on the whole, is famous for hard road conditions. That is why the American manufacturer gives his product liberal clearance, and why the domestic car, typified in the product of the Licensed Association, is able to endure difficult going.

Manufactures.—The United States annually produces something like 80,000 automobiles, while Italy manufactures 25,000 and France 40,000. Germany is another producing nation, as is England, but the two first mentioned build the bulk.

Candidate for Indiana Governorship Made a Whirlwind Tour in Premier Pathfinder.

Auto Travel and the Steamers.—Not ıny years ago it was the custom of nericans going abroad to rent foreign rs on the other side, but witbin the past o or three years this has been changed such an extent that shipments of Ameri- ı cars for private use in the Spring and ir return in the Fall, have become an m of considerable importance with many the Transatlantic lines. Formerly, tour- s were content to land at Cherbourg, ıvre, Southampton or Bremen, but now ıny prefer a Mediterranean port, and the siness has increased to a point where e of the lines has decided to make ınges in the construction of its ısels in order to accommodate the gest enclosed cars between decks. is space has previously not been suffi- nt to permit of stowing the crates used closed cars and it will accordingly be reased nine inches on all the steamers of s line. This information comes from George N. Pierce Company, of Buffalo, Y., and reached it in the shape of a let- from the steamship company in ques- ı, owing to the fact that one-fourth to -third of the machines shipped for tour- purposes were Pierce-Arrows.

& J Tire Company Addition.—The & J Tire Company, Indianapolis, Ind., e broken ground for the erection of a te addition, the new building when com- ed giving the company about 50,000 ıre feet of additional floor space. When ed as to the possible effect of the reduc- in prices on the 1909 product, President C. Dowse made this statement: The n element that justified our reduc- the price of G & J tires for 1909 is reduction in our cost of production. s has been brought about by our im- ement in the methors of manufacture, ch has resulted in fewer replacements on guarantee, and increased factory capae- which has greatly reduced our overhead nse. We shall continue the coming sea- to use the same quality and quantity naterials as we have in the past, and put forth every effort to make the best on the market. Ours is the only rub- company in this country devoted ex- vely to the manufacture of pneumatie , and for that reason all our efforts oncentrated upon this one line."

eatest Wonder of the Age.—A cir- ! put out by the Heney Gas Engine Company, Ligonier, Ind., which proposes to exploit tbe automobile field, puts forth these claims: "The Greatest Wonder of the Age: Self-igniting; no batteries; no dynamo; no hot-tube; no spark plugs; no valves; no cams; no cogwheels; no weak sparks; no wires; no trouble starts in the rain, starts in the snow; nothing to adjust; no cams to set; no sparkers to set." And then the manufacturer logically ends by saying: "What more can you ask?" Nothing! On second thought, one might inquire, will there be any "back-kick"? One is inspired to ask the question by a casual statement in the circular informing of the ability of the engine to "mote" both ways. If the motor is strong-minded, and will positively go one way at a time, all right; otherwise, one's poor judgment is: "there is one point in the dark."

Trouble Among Auto-Buggy Makers.—The Success Auto-Buggy Manufacturing Company, of St. Louis, has brought suit in the United States Court at Indianapolis against two of the motor buggy builders of that State for what is claimed to be infringements of patents held by the Success company. The statement is made that these companies, namely the W. H. Kiblinger Company, of Auburn, Ind., and the Economy Motor-Buggy Company, of Fort Wayne, Ind., entered into an agreement with the plaintiff whereby they were to pay the Success company a royalty on each buggy manufactured by them, but that the defendants have failed to carry out this agreement. The proceedings are the result of defendants' refusal.

Prize Float at Syracuse Fair.—In the commercial float parade of the Ka-Noo-No Karnival, which is held annually in connection with the State Fair at Syracuse, the float entered by the New Process Raw Hide Company, of Syracuse, N. Y., won first prize in the machinery division. The central object of the float was a huge globe about five feet in diameter, made of raw hide and surrounded by a large gear ring at the center. Inside the globe were thirty incandescent lamps, and as the raw hide is translucent the effect at night was rather striking, made doubly so by the fact that the globe was revolved by gear and chain connection from the rear wheels of the wagon.

Chicago-Milwaukee "Great White Way."—The Chicago-Milwaukee Road and Real Estate Company, whicb plans to construct a $2,000,000 "Great White Way" from Milwaukee to Chicago, will give a dinner to Milwaukee business men this week to rouse their enthusiasm for the plan. H. D. Layman and J. F. Moeller, of Chicago, have been in Milwaukee for some days talking up the project. It is planned to place $54,000 of the $100,000 common stock in that city. There will be an additional issue of $2,000,000 preferred stock. The scheme is to build a boulevard 144 feet wide, whicb will be the finest motor and horse parkway in the world.

Hoosier'a Successful Trip East.—R. I. Love and party have just returned to their homes in Indianapolis, after completing a most successful trip of over 5,000 miles in a Premier Six. The route of the tour was East, most of the time being spent in and around the Adirondacks, where the road conditions were not of the best, but Mr. Love says that at no time were they inconvenienced by repairs, even escaping with the small number of four punctures. On the return trip the party covered 1,300 miles from Saranac Lake to Indianapolis in a week, having encountered good roads, with the exception of the strip between Toledo and Fort Wayne, where rains had made the going very heavy.

J. H. Neustadt Retires.—The announcement is made that J. H. Neustadt, founder of the Neustadt Automobile & Supply Company, of St. Louis, has disposed of his entire interest in the business and retired. In the reorganization which followed, the following officers were selected: President and treasurer, E. L. Epperson; vice-president, F. J. Tecklenburg, and secretary and general manager, H. W. Gray. Mr. Epperson has been associated in many ways with the automobile industry and other enterprises, while Mr. Gray is retained from the old organization. The Neustadt Company was one of the pioneers in the supply business and has become one of the largest in the country.

Southern Tier Motor Company Expanding.—The recently incorporated Southern Tier Motor Company, of Elmira, N. Y., has taken over the automobile business formerly conducted by the Elmira Arms Company's motor department and the Willys-Crew Motor Company. The new organization will occupy the garage which the latter company controlled. The company will have the agency for several lines of cars, although the Overland will be featured. Guy W. Shoemaker, the president of the firm, will give his entire attention to the trade in Elmira and vicinity, while the secretary, Harry K. Crandall, will look after the outside and road work.

Large Quantities of Oil for the Vanderbilt.—As an example of the immense amount of oil used in connection with a race like the Vanderbilt, A. W. Harris, of Providence, states that the nine cars which used Harris oil in that event took delivery of over 900 gallons, each car averaging 100 gallons apiece. Tbis may sound like a large figure for an event of such comparatively short duration, but it should be remembered that not only must a sufficient amount be provided for all emergencies, but that part of the oil is used by the camp tenders and during practice.

A. M. C. M. A. Hand Book Ready Soon.—The official hand book of the American Motor Car Manufacturers' Association, "Leading American Cars," which is published annually by this association, will be ready for distribution

at an early date, as the data is now in the hands of the printers. The mechanical details will be arranged according to price classification, with separate divisions for pleasure and commercial vehicles. Besides the mechanical details, interesting data will be given about 1909 models made by the members of the A. M. C. M. A.

Motorcar Company Elects Officers.—The Motorcar Company of Detroit, manufacturers of the Cartercar, has elected the following officers of the company for the coming year: President, F. T. Caughey, Detroit; vice-president, A. G. Nortb, Pontiac; secretary, H. R. Redford, Detroit; treasurer, H. G. Hamilton, Pontiac; general manager, R. A. Palmer, Detroit. This company has purchased the plant of the Pontiac Spring & Wagon Works at Pontiac, Mich., and will remove from Detroit.

First Entries for 1909 A. A. A. Tour.—Although the 1909 A. A. A. Tour for the Glidden Trophy is still nine months away, automobile manufacturers have commenced preparations for it. The first public evidence of this activity is the entry of three Molines in the runabout class, and W. H. Van Dervoort, of the Moline Automobile Company, East Moline, Ill., has requested of Chairman Hower that these three cars be given the first numbers in this class.

Anderson Increases Capital Stock.—The Anderson Carriage Company, Detroit, Mich., builders of the Detroit electric, recently passed resolutions increasing the capital stock of the company from $300,000 to $500,000. An output of 1,000 electric cars is the announced total for 1909. The concern also manufactures horse-drawn vehicles, of which it will make 15,000 for 1909.

Change in Lancia Price.—The Hol-Tan Company announces that on December 31, the day of the opening of the Palace show in New York, the price of the Lancia chassis will be advanced from the present price of $2,800 to $3,000. The change has been found necessary because of the increased demand for these cars following the good showing made in the different events in which they have participated.

Woodworth Treads Reduced in Price.—The Leather Tire Goods Company, Newton Upper Falls, Mass., announce a new price list for the Woodworth treads. The prices are substantially reduced, though the firm states that there has been no change whatever in the high quality of the product. A letter to the factory will quickly bring a copy of the reduced price list.

"Spit-Fire" Plugs Share in Victory.—Two cars which bave attracted attention lately by their fast work were equipped with Mosler "Spit-Fire" spark plugs, namely the winning Simplex in the last 24-hour race at Brighton Beach and tbe 12-cylinder Maxwell which did a mile in 31 seconds at Atlantic City.

New Facilities for the Oakland Company.—The work on the large additions to the Oakland plant at Pontiac, Mich., was commenced last week and the buildings will be rushed to completion as fast as possible in order to be available for the company's increasing business.

IN AND ABOUT THE AGENCIES.

Maxwell, Philadelphia.—The Maxwell-Briscoe Motor Company has leased the former Philadelphia branch house of the Rambler at 207-209 North Broad street, for the future home of the Maxwell. Incidentally the concern which will handle the car has undergone a change of name from the Kelsey Motor Car Company to the Longstreth Motor Car Company, with William C. Longstretb as general manager. There will be no change whatever, in the personnel of the company.

Rambler, Philadelphia.—A surprise in the nature of a shock struck Philadelphia's "Gasoline Row" last Thursday when it was announced that Thomas B. Jeffery & Company had decided to abandon Philadelphia as a contributing center and concentrate its Eastern business in New York City. The Tioga Automobile Company, at Broad and Tioga streets, George C. Brownlee, manager, has been appointed Pbiladelpbia Rambler agent.

Mitchell, Philadelphia.—Taking the former quarters of tbe Hills Motor Car Company and Noblit and Fassett, at the northwest corner of Broad and Cherry, and adding to it the rear balf of the Nichols Bazaar Stables, the Penn Motor Company has thrown them all into one, and after considerable alteration has one of the finest and best equipped salesrooms and garages on Philadelphia's "Gasoline Row."

Spencer Pump Distributers.—The manufacturers of the Spencer power air pump announce that the following distributing agencies have been established: American Motor Car Company, 187 Wisconsin street, Milwaukee, for the State of Wisconsin; George W. Edge, 3924 Olive street, St. Louis, for Missouri, and the Neustadt Automobile and Supply Company, 458 Golden Gate avenue, San Francisco, for that city and vicinity.

American Wind Shield in Europe.—The demand for the "Automatic" Wind Shield abroad has been sufficient to warrant C. A. Metzger, Inc., its makers, to have the shield manufactured in the leading countries of Europe. Emil Grossman, president of the National Sales Corporation, will be in charge of the wind shield exhibitions at the London and Paris shows, and will also make contracts for the manufacture of same.

Pope-Hartford, New Jersey.—The Pope-Hartford interests in Newark will hereafter be taken care of by E. P. Cooley, late of the Mitcbell Automobile Company of New Jersey. Several subagents have already been appointed in Northern New Jersey, among them being Victor A. Wiss & Brother, of Morristown, and the Garretson Auto Company, of Somerville.

KisselKar, Chicago.—Last week negotiations were closed whereby the Middle Western territory will be handled for the KisselKar by H. P. Branstetter, of the Branstetter Motor Company, 1337 Michigan avenue. The same quarters will be used, but the name changed to the Kissel Motor Car Company. Mr. Branstetter will immediately arrange for branch agencies in his territory.

Stoddard-Dayton and Reo, Santa Rosa, Cal.—Captain O. L. Houts and D. C. Prentice, of Santa Rosa, Cal., have formed a partnership and taken the agency for the Reo and Stoddard-Dayton cars for the coming year. F. J. Wiseman, well known as a Stoddard-Dayton driver, will be associated with them in the new venture.

Twentieth Century New Selling Agency.—The Twentieth Century Manufacturing Company, makers of lamps and generators, announce that the entire selling end of the business, so far as the automobile trade goes, will hereafter be in the bands of the Stevens-Britton-Maurel Company, of 1783 Broadway, New York City.

Richmond Roadster Distributing Branches.—The Wayne Works, Richmond, Ind., manufacturers of the Richmond cars, have made arrangements with the Racine Boat Mfg. Co. to act as the agents for the Richmond Roadster at all of that company's branches, located at New York, Boston, Philadelphia, Detroit, Chicago and Seattle.

Oldsmobile, Baltimore.—Tbe Oldsmobile will be taken care of in Baltimore for the coming year by the R. E. Leinbach Auto Company, 2312 Madison ave-

Annual Conferance of Wavsrley Salesmen and Officers.

The regular annual conference of salesmen and officers of the Waverley department of the Pope Motor Car Company has been an annual feature of the Indianapolis factory. The most successful one ever held, however, was the recent one, where the "New" and "Old" combined in united effort to dig out all of the points regarding this well-known electric carriage, which would be to ite benefit and theirs in pushing its sale. The above illustration shows the "New" and "Old" between the hours of conference. Reading from left to right, lower row: H. W. Goodman, Charles M. McAlpin, purchasing agent; Herbert H. Rice, vice-president and manager; Carl von Hake, treasurer; Wm. B. Cooley, president; Wibur C. Johnson, secretary; Roy A. Potts, sales manager. Top row from left to right: E. K. Shugert, R. T. Davie, P. W. Wigner, K. W. Brewer, H. W. Dickerman, E. R. Vincent, W. S. Gilbreath.

nue. This company is now planning to move into more commodious quarters in the vicinity of Ninth avenue.

Jackson, New York City.—The agency for the Jackson cars in this city formerly held by the George J. Scott Company, has been taken by C. W. Oathout at the same place, 1729 Broadway. Mr. Oathout has been Eastern sales manager for the Jackson Company for a year.

Apperson, St. Louis.—Elmer Apperson, of the Apperson Brothers Automobile Company, Kokomo, Ind., who was in St. Louis recently, made arrangements with the Capen Motor Car Company to represent the Apperson in St. Louis for 1909.

Regal - Detroit, Philadelphia. — The latest newcomer to Philadelphia's big automobile family on North Broad street is the Regal-Detroit, for which the Thomas M. Twining Company, at 326 North Broad street, recently acquired the local agency.

De Luxe, New York City.—The De Luxe Motor Car Company will be represented in New York City by H. R. Mallow, who has charge of the new branch just opened on Broadway.

Continental Tires, Cleveland.—Continental tires and demountable rims will be distributed in Cleveland by Charles E. Miller, 1829 Euclid avenue.

Franklin, Grand Rapids, Mich.—Adams & Hart, of 47 North Division street, Grand Rapids, have taken the agency for the Franklin car.

Autocar, Pittsburg.—Urling & Company, of Pittsburg, has taken the agency for the Autocar as well as the Corbin.

G & J Tires, Pittsburg.—The Iron City Tire Repair Company has taken the agency for the G & J tires.

PERSONAL TRADE MENTION.

Peter S. Steenstrup is one of the latest to succumb to the allurements of matrimony, and, furthermore, he is to become a resident of Detroit, having purchased a residence at No. 75 Calvert street in that city. Mr. Streenstrup is well-known as secretary of the Hyatt Roller Bearing Company, located at Harrison, N. J., but through the necessity of spending much of his time in the Middle West, he has decided to become a resident of Detroit, where he and Mrs. Steenstrup returned recently from their transcontinental wedding tour.

Peter S. Steenstrup.

William T. Taylor ("Billie"), who is at the head of the Philadelphia branch of the Olds Motor Works, will celebrate Thanksgiving Day by banqueting all the Oldsmobile agents and subagents in his territory at the Bellevue-Stratford. As his bailiwick includes Pennsylvania, New Jersey, Delaware, Virginia and the District of Columbia, "Billie's" guests will requlre several large-sized tables to serve them.

H. A. Githens, who for many years has been general traveling representative of the G & J Tire Company, has been advanced to the position of general sales manager. Mr. Githens is one of the best-known men connected with the industry, and his advancement is a just reward for conscientious services, according to the opinion of his many friends.

Emil Brossman, president of the Motor Car Equipment Company and the National Sales Corporation, sailed November 4 on the "Lusitania" to attend the Olympia show in London and the Grand Palais Salon in Paris. Mrs. Grossman accompanied him on the trip.

F. J. Lind, who is vice-president and general manager of the Maxwell-Briscoe-Pacific Company, agents for the Maxwell in San Francisco, has gone to Los Angeles, where he will take over the Maxwell interests formerly handled by the Maxwell-Briscoe-Willcox Co.

Charles M. Hall, for five years sales manager for the Badger Brass Manufacturing Co., makers of Solar lamps, at Kenosha, Wis., has resigned to become general manager of the American Lamp Co., at Detroit, Mich.

C. E. Smith, who has been with the Farmers' National Bank for a number of years, has left that institution and gone into the automobile business as the manager of the White Garage Company, Baltimore, Md.

J. H. Newmark, formerly of the Olds Motor Works, will be in charge of the newly formed publicity department of the Oakland Motor Car Company, of Pontiac, Mich.

George L. Breet, Jr., formerly with the White branch in Boston, has joined the sales department of the Algonquin Motor Company, Boston agents for the Oldsmobile.

George Fitzsimmons, formerly with the White Company in New York City, is now with H. J. Koehler in charge of the E-M-F sales department in New Jersey.

Harry De Groat has severed his connection with the Rambler Company, of Philadelphia, and in the future will be with the staff of the Studebaker Company.

M. J. O'Connor, who has been with the Pennsylvania Company in Cleveland as C. W. Moody's assistant, has gone to the Chicago branch.

C. A. Eastman, Pacific Coast sales manager for the White, is making an extensive inspection of the territory under his control.

OVERLAND DEVELOPMENTS.

INDIANAPOLIS, IND., Nov. 2.—With the sale of the majority of the capital stock of the Marion Motor Car Company, it is announced that the manufacture of the Marion will be discontinued after this season. J. N. Willys, president of the Overland Automobile Co., and E. B. Campbell have purchased 989 out of 1,000 shares of stock in the Marion company.

The Marion plant has been placed at the disposal of the Overland company, and is being used for the manufacture of Overland engines and part of the other mechanical equipment, the assembling being done at the Overland plant, in West Indianapolis.

In line with its plans to manufacture 2,000 cars next season, the Overland company is now building a substantial addition to its West Indianapolis plant, which will be completed within the next few weeks. Edward Sourbier, for some time with the Marion Car Co., will be general manager of the Marion plant at Fifteenth street and the Big Four tracks.

Carl G. Fisher's Auto-carrying Balloon.

AN AERONAUTIC AUTOMOBILE

Automobiling has always been closely associated with aeronautics, as the majority of enthusiasts in the latter field have been recruited from the former, but it has remained for Carl G. Fisher, of Indianapolis, to combine the two sports. Mr. Fisher, in addition to being an ardent navigator of the air, is the Indianapolis agent for the Stoddard-Dayton car, and, becoming tired of having to impress a farm wagon or other equally slow and uncomfortable method of transport to carry his party and the balloon from wherever the latter alighted, to the nearest railway station, he decided to take a car with him instead. In place of the usual basket, he substituted a Stoddard-Dayton 25-horsepower car, which was attached to the load ring of the balloon in the usual manner.

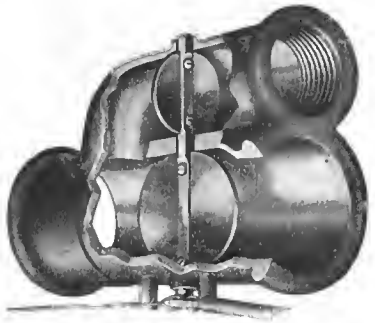
Last Friday, accompanied by Captain Brumbaugh, the well-known aeronaut, an ascension was made from Indianapolis. The plan was to make a 100-mile flight, landing just outside of Dayton, O., then load the gas bag on the deck of the automobile and proceed into the city. A westerly wind started the aeronauts in the desired direction, a few minutes after the big bag and its novel attachment were released at Indianapolis, and a landing was successfully made in a corn field near Dayton, just at dusk.

A Good Evidence of Busy Times.

INFORMATION TO AUTO USERS

Gabriel Products for 1909.—The products of the Gabriel Horn Mfg. Co., Cleveland, O., for 1909 show many improvements over former models.

As it is necessary to have a perfect working valve to operate an exhaust horn satisfactorily, the Gabriel company has perfected a valve that is guaranteed



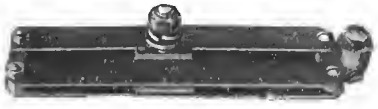
NEW GABRIEL CUT-OUT VALVE.

not to stick under any conditions. The instant the operating lever is moved, the disk in the main channel begins to close and the disk in the branch channel, placed at an angle of 90 degrees, starts to open. This gives immediate escape to the exhaust, causing the horn to respond, and prevents building up of back pressure. By removing the circular disk in the main channel of the valve, as shown in the illustration, a correct valve

THE 1909 GABRIEL HORN.

for the relief of the exhaust is secured; this gives a 1 1-4-inch escape opening in addition to the regular outlets; in other words, a perfect cut-out that relieves all back pressure caused by the muffler. When the valve is closed it does not allow any leaking of the exhaust or cause any noise. These valves are made up to fit all standard sizes of iron pipe or steel tubing ranging from 1 inch to 2 1-2 inches outside diameter.

While the outward appearance of the Gabriel Horn is the same as the 1908 product, the new model is superior in tone to any previous models. A little device has been perfected which makes it possible for the horn to produce a

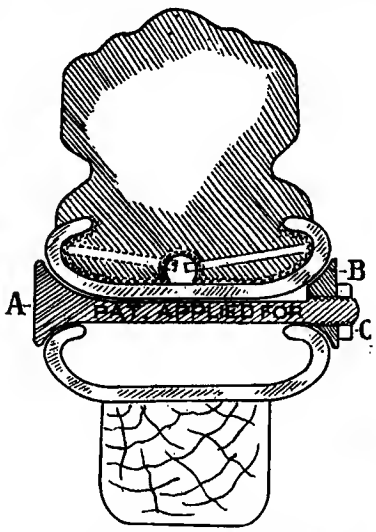


LATEST GABRIEL SHOCK ABSORBER.

sweet musical tone for city use; however, the pitch is such that the three notes can be caused to rise in unison, which makes a penetrating warning for country riding. The company will continue to furnish single-tube, three-note horns in four sizes to fit any size of motor.

The shock absorber manufactured by this company will in the new models have an increased bearing surface for attaching to the angle plate on the spring and a new method of fastening the stud to the friction pad by use of a 1-2 by 3-4 by 2 1-4 inch case-hardened block; this gives a 5-8 inch bearing on the stud, which allows it to turn, thereby taking care of the end motion the same as side links on a spring. These two features eliminate all noise or rattle and cause the absorber to be quiet in its action, and, owing to the use of a new friction material, the effectiveness and durability of the absorber is increased.

Swinehart Rim Attachment.—This attachment permits of equipping an automobile with Swinehart cushion tires without in the least disturbing the original rim equipment or changing the road clearance of the car. Pneumatic tires can be replaced by cushion tires in less than five minutes. With this attachment one or more cushion tires can be used in connection with pneumatics, on the same car, with excellent results, as the outside diameter of the wheels is not altered. It is a well-known fact that cushion tires are necessarily somewhat



SECTION SWINEHART RIM ATTACHMENT.

less in height than pneumatics, which formerly rendered the above impossible.

Swinehart cushion tires are fitted on light clincher rims at the factory, and are then shipped to car owners, together with bolts for attaching. Eight bolts are ordinarily required for each wheel. The nuts on these bolts need not be removed, simply loosened. The bolts are all placed on top of the rim on the wheel, and the tire and rim thrown into position. The bolts are then easily slipped around to their proper position, and tightened with a wrench, which securely clamps the rim and tire to the wheel.

One of the advantages of this attachment is its utilization as a spare wheel in case of injury to one or more pneumatics. A pneumatic tire can be replaced with Swinehart spare rim and tire in less than five minutes, and it is claimed that this spare wheel will run thousands of miles without any further attention. The Swinehart company claims this to be a most practical spare equipment, as it brings the strain directly over the bearings of the wheel on the same plane as with the original tire.

A Handy Dry Cell Holder.—The R. W. Magna Mfg. Co., Holyoke, Mass., are bringing out a new dry cell holder to be known on the market as the Magna quick change rigid battery holder. Amongst the claims for this equipment are the obvious features enabling one to replace a set of cells with-

out having to cope with the annoying details of loose end wires and other well-known troubles. The illustration indicates very clearly the absence of thumb screws and other small parts, likely to loosen, thus destroying the electrical contact; if indeed, they may not be lost. The principal of the wedge is employed in holding the cells in place, incidentally affording terminal connections as a combination feature, while the wiring is by way of permanent "bus bars" within the box. The whole idea is to provide batteries in which the electrical connections will remain good when made, and in which replacements can be affected quickly and without trouble.

The "Auto-Felt Boot."—The accompanying illustration shows the type of boot which A. H. Putnam & Company, Danvers, Mass., are manufacturing especially for use by automobile users in cold weather when

THE AUTO-FELT BOOT.

difficulty is sometimes found in keeping the feet warm. It is made with a felt top, foxed with leather, has a heavy felt lining, and is ten inches in height. The sole is a heavy, one-half double leather.

Graphlio Grease.—The Walter D. Carpenter Company, 39 Cortlandt street, New York City, has just brought out a new mixture to meet the demand for a non-fluid oil for automobile use. Graphlio grease is a mixture of pure neatsfoot oil of low cold test, free from stearine, and the Graphlio oil made by this company. This concern claims that the crystalline Graphlio, free from grit and dirt, in good grease, produces a mixture best fitted for all the uses of hard grease. The new preparation is furnished in five different consistencies.

Vol. XIX New York—Thursday, November 12, 1908—Chicago No. 20

The Automobile

The Vanderbilt Cup Winner "At Home"; the Trophy Which It Won Octobsr 24; ths Man Who Drovs It to Victory.

BRIDGEPORT, Conn., Nov. 9.—No Olympian chariot and charioteer was ever accorded a more royal welcome than Bridgeport accorded the Locomobile and George Robertson, victors in the Vanderbilt Cup race, on the occasion of their home-coming this week. The celebration was really a two-day affair, starting with a triumphal run from New York to the Connecticut city on Sunday, continuing with an afternoon of jubilant reception on Tuesday, and winding up that evening with a great banquet, at which the keynote was "local pride" over the fact that the first American car to win an international road race was "built in Bridgeport!" Of course Bridgeporters got excited.

The demonstration of enthusiasm and the wild hurrah of welcome and congratulation that marked the banquet was without dispute one of the most noteworthy evidences in the whole history of the sport in this country of how heartily Americans are ready to give encouragement to any triumph that marks the progress of the American automobile industry, and the success of American drivers in the handling of motor cars of home production in international speed competitions. As one speaker remarked: "Were every town to give its car the backing that Bridgeport does the Locomobile, there would be a corps of racing machines evolved that would furnish a topnotcher worthy of competitive comparison with the products of the world."

Illustrative of Bridgeport's universal co-operation in doing honor to the victors, it is to be noted that the banquet was promoted jointly by the Automobile Club of Bridgeport, the Bridgeport Board of Trade, the Manufacturers' Association, the Business Men's Association and the Press Club of Bridgeport. In the great dining-room of the new Stratfield Hotel were gathered 300 of Bridgeport's representative men, and still there were some that could not find seats at the tables. No such assemblage had ever before been gathered at a banquet in the city's history.

On a pedestal in front of the long guests' table stood the historic Vanderbilt cup itself. The sight of it seemed a constant inspiration to enthusiasm. In fact, it was a hurrah dinner from start to finish. The corks had not been popping many minutes before the banqueters broke forth in song. Two songs in particular proved highly popular and were shouted in chorus at every provocation, and the provocations were frequent. One was sung to the tune of "Harrigan" and ran as follows:

R-O-B-E-R-T-S-O-N spells Robertson,
Gee! but did you see the speed that's in him?
Devil a driver has a thing agin him.
Robertson, Robertson,
He's the king of the ring,
Not a thing can compare with Robertson.

The other had for its theme A. L. Riker, the designer of the car, and was a paraphrase on "Hallelulah":

There's a man we admire,
He's a man we all love,
In the ranks of designers
He's 'way up above.
Hallelulah! He's a corker!
Give him a cheer for the guest,
Hallelulah! Get up and holler
For our vice-president.

With 300 voices and an orchestra to accompany, the singing was indeed electrifying. It would have survived Niagara's roar.

The Hon. Stiles Judson, State attorney, who filled the post of toastmaster, was not only patriotically eloquent, but kept the fun going as well, always ready with clever repartee in response to the shots fired at him constantly from the tables. He had beautiful bouquets to hand out to Robertson, Riker and the Locomobile Company, and he did it most artistically.

Main Street in Bridgeport, Conn., with the Victor Receiving the Hearty Applause of the Multitude.

George E. Hill, speaking for Mayor Henry Lee in his absence, paid a glowing tribute to the mechanics that built the winning car.

Amzi L. Barber declared that he had started the Locomobile Company to give a job to his son-in-law, Davis, and that the presence of the Vanderbilt cup proved that he had made good. Mr. Barber quickly switched to a discussion of good roads, in the course of which he sketched their history and told of the accomplishments of Macadam and Telford. He advocated building a strip of asphalt in the center of all macadam roads, which, he said, would insure an imperishable and dustless highway. In conclusion, he declared himself in favor of the expense of roads building being divided equally among the government, the State, the county and the township, one-quarter each.

Then Judge E. K. Nicholson, on behalf of the Board of Trade, presented its engrossed resolutions of congratulations to the Locomobile Company.

S. T. Davis, Jr., in receiving them, said that the bringing of the cup to Bridgeport was primarily due to the sportsmanship and liberality of William K. Vanderbilt, Jr., and that his rules had made it possible to produce the speed machine that had evolved successful. Mr. Davis told how Dr. Thomas, of Chicago, had ordered the first racer and how that had led to the building of the two cars that had finally triumphed. He touched upon their failures and their successes on the path to the ultimate victory in the recent race. In conclusion, he said: "Racing is expensive, but it pays—when you win."

Next came the eloquent presentation by Thomas H. Macdonald of a silver shield to the designer of the winning car. Mr. Riker was brief and modest in his reply, attributing the success of the car to the material, workmanship and superintendence supplied by the company.

En Route "Home" Robertson Excited Interest Galore.

Then came George Robertson's turn at recognition. It took the form of a silver cup. In presenting it, Horace E. Jackson told of the famous men that Bridgeport had given the world of invention. The inventors of the Maxim and Hotchkiss guns and the Howe sewing machine were Bridgeporters. Wilson Marshall, who won the Kaiser's transatlantic yachting trophy, and Harry Porter, who is the Olympic champion at jumping, also hail from the Connecticut town. Robertson modestly thanked the donors and expressed the wish that next year the Locomobile Company would build three racers and send them over to France for the Grand Prix.

Frank G. Webb, vice-chairman of the Vanderbilt Cup Commission, extolled the sportsmanship of the donor of the cup and told how his appointment to the Racing Board by A. R. Pardington, and a subsequent conference, had resulted in the giving of the cup and the inauguration of the Vanderbilt races. He declared that the Locomobile's victory marked the end of the contests of great racing cars, and hoped that the Locomobile Company would be represented next year by a team of cars of 130 mm. cylinder measurement.

John C. Wetmore, who was the last of the regular speakers, suggested that the citizens of Bridgeport, embracing not only its business men but the school children as well, build at their own expense three Locomobiles and enter them for the next Grand Prix in France.

Many Prominent in the Trade at the Speaker's Table.

At the speaker's table the notables, of course, embraced S. T. Davis, Jr., the president of the Locomobile Company; A. L. Riker, its vice-president and designer; E. F. Russell, the superintendent; John A. Kingman, the advertising manager, and Driver Robertson and Mechanic Ethridge.

Other well-known celebrities in attendance were: Henry Hess, William Gray, Clarence Whitney, Howard E. Raymond, Harry Fisk, Alfred Reeves, William Hobbs, Cortland Cramp, J. H. McAlman, John F. Plummer, W. F. Fuller, Fred J. Wagner, Russell Field and William Culver.

The banquet had followed a most enthusiastic greeting in the afternoon by the city at large to Robertson and the Locomobile. Many factories were closed and all the public school children were let out to join in the welcome. At the ringing of the fire bell, sharp at 3 o'clock, George Robertson and his mechanic, Glen Ethridge, left the Locomobile factory in the victorious car, amid an ovation of hilarious cheering by the workmen in the Locomobile factory. Thousands packed the sidewalks along the line of parade and the police had hard work restraining over-

enthusiastic welcomers from rushing on the road and mobbing the heroes of the day with congratulations. The parade of the victorious outfit was an ovation from start to finish.

The run to Bridgeport on Sunday was a triumphal procession. Robertson started from the Locomobile headquarters in New York City, at Broadway and Seventy-sixth street, at 9:45 a. m., escorted by 10 Locomobile touring cars bearing enthusiasts. Stops were made at New Rochelle and Port Chester, where car and driver were greeted by crowds afoot and in automobiles. In fact, all along the route spectators had gathered to see the passing of the famous racing outfit. At Greenwich there was a halt for an hour at the Indian Harbor Yacht Club, where luncheon was served to the escorting caravan of New Yorkers and the contingent of Bridgeport automobilists that had come to greet the car and escort it to its home town. Just out of Greenwich on the homeward trip a ball broke in an engine bearing and necessitated the car being toured the rest of the way. Despite this inglorious form of entry to its native town, there was the most enthusiastic greeting awaiting it and its pilot by the thousands that had gathered to welcome them.

Formal Presentation of the Cup.

The formal presentation of the Vanderbilt cup to the Locomobile Company of America is scheduled to take place to-night at half-past eight o'clock at the Automobile Club of America.

An attractive program has been prepared. Besides the formal presentation of the Cup by Jefferson deMont Thompson, chairman of the Vanderbilt Cup Commission, and a limited number of speeches by men well known in the automobile world, there will be an informal social gathering in which moving pictures of this year's French Grand Prix, the Motor Parkway Sweepstakes, and the Vanderbilt Cup race, with several musical selections, and cigars and light refreshments will be features.

On this occasion many people will see the Vanderbilt trophy for the first time. Nearby will be the A. C. A. Gold Cup, which will be struggled for at Savannah on Thanksgiving Day. Five thousand invitations have been issued.

Exactly what will be the form of competition for the Vanderbilt Cup in 1909 is yet undecided. It may be a "national" contest for racing cars, but another suggestion would make it a fall event of the stock car chassis variety.

The Bicycle Cop Was Lenient to the Cup Winner.

N. A. A. M. PERFECTING TRAFFIC DEPARTMENT.

For the purpose of still further enhancing the importance of its traffic department, the National Association of Automobile Manufacturers, Inc., has arranged for a series of meetings of the traffic experts connected with the automobile factories. The department, under the arrangement recently made, now represents not only the National Association of Automobile Manufacturers, but the so-called licensed and unlicensed associations as well, embracing a membership of 93 members. Of these a great many, but not all, take full advantage of the facilities offered by the department, which attends to classification matters, checking of freight bills, the proper classification of goods shipped to and from the factories, the preparation of and all other attention to claims, etc.

Mr. Marvin, the manager of the traffic department, is at present in the West attending a meeting of one of the classification committees, and will, as soon as that meeting is over, hold meetings with the traffic managers in Cleveland, Indianapolis, Chicago and Detroit. Later on meetings will be held in Eastern cities, and it is not unlikely that general meetings will be held during the New York and Chicago shows. Arrangements are being tentatively made and meeting with approval.

Many of Bridgeport's Substantial Business Men Honored the Big Banquet with Their Presence and Enthusiasm.

ST. LOUIS HAS THREE DAYS OF VARIED RACING

ST. LOUIS, Nov. 7.—For the first time in its history St. Louis has had a three-day meet. Besides, it has had a hill-climb for the first time. The St. Louis Automobile Manufacturers' and Dealers' Association is responsible for getting the thing started, while E. A. Moross, a well-known manager of a brace of automobile actors, helped out with his really clever methods of racing on one-mile circular tracks. No one, despite several olose calls, was mortally injured, unless it be a man who struck the track hard while being discharged from a Moon car in the novelty race, and the chances are in his favor. All the events were sufficiently interesting to more than satisfy the 4,000 persons who went to the old Fair Grounds race track for the events on Saturday, and the most of 7,000 which turned out on Sunday.

Final and Steepest Grade of Solomon's Hill.

The hill-climb on Friday drew 500 automobiles 14 miles out on the Manchester road to Solomon's hill, where a course bad been measured off sixteenths of a mile in length up the grade that increases in steepness as it runs to the summit, making a circuitous turn on the way. By foot and by car nearly 5,000 people assembled to see the speeding, for St. Louis had never had a similar event before. One accident, which might have cost the driver his life, occurred in the early part of the sprinting. A Moon car, swinging up the hill at a 40-mile clip, hit the turn too fast, and, after several contortions, settled back with a collapsed rear wheel. Until the cloud of dust subsided thousands believed that something very serious had happened, and it was a miracle that Phillip Wells, the driver, was sitting at the wheel of his car with a smile on his face.

On account of some misunderstanding between the judges—Alden H. Little, James Hagermann, Jr., and E. Percy Noel—and the contest committee of the Manufacturers' and Dealers' Association, the percentages have not yet been calculated, so that it is not yet known how the cars finished in the climb. It is probable that the Stanley special car driven by Baldwin was the winner of the free-for-all, and that the next best percentage was made by the Apperson driven by McClain. Tuttle probably took second place among the gasoline cars with a Stoddard-Dayton.

At the Circular Track Meet.

The spirit of the two-day meeting at the Fair Grounds was proclaimed in red ink, so that every one might read: "Spectators are warned to keep off the track, in case of accident, as races will continue regardless of results to spectators, drivers, or cars." The first event was only fairly started before Tim Bohnsen, a competing motorcyclist, fell from his machine and rolled forty feet, to be picked up with a broken nose and other injuries. In the third event, a special race for Moon cars, William Igou, blinded by the dust, crashed through the outer fence, near where Oldfield killed two men four years ago. As if by a miracle, car and driver escaped without a scratch.

The early accidents did not appear to dampen the spirits of other entrants, including Baldwin, who again proved the star of the day. In spite of the turns being banked only for horse-racing, he tore around them at a gait that made some of the veterans of the game sit up and look interested. Clinging close to the outer edge of the track almost the entire distance, so that he covered more than a mile in his circuit, he trailed a great cloud of steam and dust behind bim. On the turns he seemed to shoot across diagonally, and when he had reached the straightaway of the far stretch, he shot abead faster and faster, while the crowd in the grand stand stood up and yelled. When his time of 54 4-5 seconds for his exhibition mile was announced the wise ones shook their heads, for they knew that no gasoline car present could better the new record for a single mile, although the steamer would have been outclassed in a much longer distance.

Christie Oldfield and Ollie Savin all tried to better the steamer's time, but failed. Christie went around in Oldfield's former record time of 59 seconds; Oldfield did the same, and Ollie Savin, driving Christie's "Dreadnought," made it in 1:07. Jack Taylor drove the 45-horse-power Stoddard-Dayton in 1:08, while Charles Soules did the distance in 1:01 5-5 with the Stearns "Red Devil."

The contests between the star drivers in heats of the Sweepstakes, the finals of which were run off Sunday, were close and interesting; but the feature race of the day proved to be the free-for-all handicap for three miles, with five cars running. It was won by Paul Caldwell, driving a six-cylinder Pierce Arrow.

Sunday's track racing was partly a repetition and a continuation of the day previous. There was one serious accident, during the novelty race, which otherwise would have been very amusing. The injured man was hurt about the head while being "discharged" from a Moon car, but will probably recover.

Summary of Solomon's Hill Climb.

CLASS A—MOTOR BUGGIES; WHEEL DIAMETER, 36 INCHES.

1.	Victor	Oliver	1:53
2.	Success	Siddway	2:11
3.	Eureka	Allen	2:12

CLASS B—TOURING CARS, ROADSTERS, TOURABOUTS.
Piston area under 50 square inches.

1.	Buick	McQuillen	1:04 4-5
2.	Chalmers-Detroit	Paine	1:05 2-5
3.	Jackson	Delaney	1:21 3-5

CLASS C—TOURING CARS, ROADSTERS, TOURABOUTS.
Piston diameter over 50 and under 65 square inches.

1.	Apperson	McLain	1:00 2-5
2.	Moon	Igou	1:03

CLASS D—TOURING CARS, ROADSTERS, TOURABOUTS.
Piston diameter over 65 and under 90 square inches.

1.	Stoddard-Dayton	Tuttle	:49
2.	Packard	Lewis	:54 4-5
3.	Stevens-Duryea	Blumcoe	:55 1-5

CLASS E—TOURING CARS, ROADSTERS, TOURABOUTS.
Piston area over 90 square inches.

1.	Apperson	McLain	:45
2.	Stearns	Oldfield	:46 2-5
3.	Stearns	Soules	:46 2-5

FREE-FOR-ALL.

1.	Staniey Special	Baldwin	:40 4-5
2.	Stanley	Baldwin	:43 1-5
3.	Stanley	Woodward	:45
4.	Apperson	McLain	:45 2-5
5.	Stanley	Cull	:45 2-5
6.	Stoddard-Dayton	Tuttle	:49
7.	Stearns	Oldfield	:49 2-5
8.	Pierce	Caldwell	:49 4-5

Savannah Making Final Preparations

SAVANNAH, GA., Nov. 10.—Savannah may be said to be on the last lap of its preparations for the Grand Prize race of Thanksgiving Day, and for the light car event of the day before. The greater number of foreign and American drivers are already located in their camps and are becoming acquainted with the picturesque course, which, banked and oiled, has been in condition for racing for several days. In fact, the track was ready for the race a week ago when the advance guard of the drivers arrived. Those who are here started Monday speeding their machines over the course. No requirement has been made of them except that they exercise caution when in the neighborhood of the city or the settlements. The road, however, runs from the city out towards the marshes and the sea, and in some cases is cut for miles through virgin forest with never a house near the track, so that except in few instances there is now on impediment to the drivers cutting their flyers loose whenever they choose. However, to give them every opportunity to learn the course under speed conditions, they will be given a guarded track for two hours a day for ten days before the races. The signs and banners are already up on the course, showing the turns and crossings, and giving the other information necessary to the driver. It is possible that the foreign signs may also be used.

It is the consensus of opinion that all American records will be broken on the course. The number of turns may preclude the breaking of Nazarro's world's record, though there are some of the visiting experts who will not even admit that. The more conservative estimates figure that the winner in the Grand Prize will travel the 400 miles at an average speed of between 68 and 70 miles an hour. Some of the laps they figure may be made at a speed of over 75 miles an hour. Miles of new straightaways have been constructed since the running of the stock car races in March, and turns have been in some cases entirely eliminated. At Isle of Hope the most dangerous series of turns has been done away with; in one case this has been accomplished by a detour through a private park three bad turns were eliminated and one sweeping banked turn substituted. While the number of turns even yet remaining takes away some of the speed of an undoubted remarkably fast course, they add a sporty element which appeals to those who think races of this kind should require the maximum skill from the winning driver, rather than a daredevil recklessness which only needs to cut it loose on a straightaway course. The straightaways with their perfect surface will cut off the seconds added at the turns. DePalma, who has the world's mile track record to his credit, and who has figured considerably in sprint racing, says there is no part of the Ormond-Daytona course which is better than the Ferguson avenue stretch of four miles between Beaulieu and Isle of Hope.

One of the Bridges Over the Course.

This is a part of the new roads which have been built especially for this race. Thousands have been spent in this road building.

The course for the light car race could not be better. It is a perfect 10-mile rectangle, with all turns scientifically banked, and as level as a billiard table almost. There is no reason why new world's records should not be set up in this race.

Savannah is determined to make an event of the races apart from the contests themselves. Two 20-round fights by well-known pugilists are scheduled for the nights of the two racing days. The following day will be devoted to an airship exhibition and other attractions. The great effort, however, is being concentrated on the successful conduct of the races. The military with almost twice the number used before will be on the job of policing the course. Martial law will prevail as before. Governor Smith, who gave the consent for the use of the troops for the March Stock Car races, has again agreed to proclaim martial law over the course for the two races and order the troops under the same commanders as before to keep the track clear for the racers. In this respect it may not be denied that Savannah has the best record of any other American city which has held road races.

The Savannah Automobile Club proposes to do itself proud in the accommodation of the visitors and the entertainment of its guests. An information bureau will be open at the Union Station to supply visitors with any information desired. The chief work of the office will be to direct applicants to places where they can be accommodated during their stay here. Tabulated information of every hotel, boarding house, and private residence which will receive visitors will be on hand, together with abundant help to make the work successful. The bureau will have telephone lines connected with the various places where visitors will be received so that tab may be kept on their capacity at all times. The club has gone into this feature with the same enthusiasm and the same thoroughness it has tackled the details of the races and will make just as great a success of it. It is an easy bet that accommodations will be provided for far more visitors than come, though the city expects a record-breaking crowd. It has been arranged to take care of many visitors in dozens of private and Pullman cars on sidings which have been laid adjacent to the grand stand. Special docking places have been arranged for chartered steamships which will come from New York, Philadelphia and Baltimore. Several are already scheduled.

A feature of the races will be the entertainment of the visiting newspaper men. Savannah has a record in the matter of entertaining newspaper men and proposes to keep it up. A recent delegation of visitors from newspaper row in New York is still remembered very pleasantly here, and the entertainment meted

out to them will be nothing to compare with the treatment accorded the visitors to the Grand Prize Race. The city started to get its hand in last week when the newspaper men from all over Georgia were invited here and wined and dined and taken over the course. Forty odd of these were in the city at the time and left loud in their praise of the course and promising large delegations from their respective cities to the races.

The arrangement with the Automobile Club of America is that the Savannah Club will have practically all the proceeds from the races. The local club in turn has decided that the proceeds shall be expended in advertising Savannah. They have determined that one of the ways they will expend this money is to give the visiting newspaper men a good time while here. Those who have been here know what this means. The others will have a right good time finding out.

It has been decided to start the light car race of Wednesday at 11 A. M. The Grand Prize event of the following day will start at 8.30 A. M. While these comfortable daylight starts may rob the contests of much of the picturesqueness attendant upon the break-o'-day beginning of the Vanderbilt race, it is fairly good guessing that those who do not care particularly to see the sun rise will be more comfortably satisfied with the later hours.

FROM THE NEW YORK END OF THE RACE.

New York, Nov. 8.—Of the fourteen foreign drivers engaged to pilot European cars in the Grand Prize Race on Thanksgiving Day, eleven have arrived. The *Kaiserin Augusta Victoria,* which got in on Saturday, had aboard Victor Hemery, Rene Hanriot, and Fritz Earle, the Benz trio; and *La Touraine* on Sunday brought Francois Szisz, of the Renault team. This quartette has joined the contingent already at Savannah, which is made up of Wagner and Nazarro, Fiat; Cagno and Piacenza, Itala; Hautvast and Rigal, Clement-Bayard, and Duray, Lorraine-Dietrich.

Rival importers have different stories to tell of the possibilities of the coming of a pair of Mercedes candidates, scheduled to be driven by Poege and Salzer.

There was some possibility early in the week, according to an A. C. A. press announcement, of there being two additional entries—one of a Buick, the 50-horsepower machine driven by Burman in the Lowell race, and the other a third Renault, a duplicate of this year's Grand Prize models, which had been shipped with the other two Renaults. It was said that Paul LaCroix would make the entry, provided that Renault Frères would furnish a driver. George Robertson in a cable to Mr. LaCroix made application for the mount. The Vanderbilt Cup winner also had a chance of a seat at the wheel of a Panhard now in this country, provided a sale of it was made to a prospective purchaser with Grand Prize aspirations. The Buick was announced on Tuesday as entered.

Leonard Zengle will supplant Cyrus Patschke as pilot of the Acme, the latter being deemed by the company's officials at present a bit too young for such responsibility.

W. Du Cros, of the Dunlop Tire Company, of London, has come over to look after the interests of his company in the race, the two Clement-Bayards and the Lorraine-Dietrich having already contracted for Dunlop equipment.

The Continental Caoutchouc Company has added to its Grand Prize offer of $4,000, split into $2,000 for first, $1,250 for second and $750 for third, another offer of $500 for Continental equipment in the light car race—$250 for first, $150 for second and $100 for third.

The latest addition to the prize list comes from the Bosch Magneto Company, which offers $500 to first, $250 to second and $100 to third, provided that the cars in question be equipped with Bosch magnetos.

According to a report from Pottstown, Pa., the six-cylinder Chadwick was recently timed on a four-mile course near Bristol and developed a speed of 111 miles per hour. The excellent showing of the Chadwick in the Vanderbilt will cause it to be most interestingly watched at Savannah, though its makers recognize that they are competing against specially built racers.

Information concerning the Lozier entry is to the effect that it is a regular stock model, with the exception of the motor, which has a 5 3-4 inch bore instead of the regular 5 1-4 inch; the stroke remaining at 5 1-4, the same as in the stock car. It is stated that private time trials on the road near the factory at Plattsburgh, N. Y., have been entirely satisfactory.

Fournier on His Way to America.

A cablegram from Henry Fournier, received Wednesday morning, gave the information that he is on the *Kron Prinsessen Cecilie,* which means that he will reach New York Tuesday next.

In the early days of automobiling in this country, one of the most prominent figures was this same Fournier, winner of the Paris-Bordeaux and Paris-Berlin races. His American performance of a mile in 51 4-5, driving a Mors on the Coney Island boulevard, remained as the American record until it was beaten by William K. Vanderbilt, Jr., with his mile of 39 4-5 on the Ormond-Daytona beach with a Mercedes.

Fournier is now an Itala pilot, having charge of the French representation for that Italian make. His garage is one of the largest in Paris and is much frequented by Americans. It is needless to say that Fournier can talk to them in their own language, which is a source of great satisfaction to a visitor in foreign parts.

Concerning the Light Car Race.

The three Oldsmobiles entered for the light car race have been withdrawn, F. L. Smith, vice-president of the Olds Motor Works, stating that it was found that they could not be prepared in time.

A third Chalmers-Detroit has been nominated by W. T. Bryson, the Savannah agent. It will be driven by Burns.

The Gregoire and the S. P. O., two of the European entries, are on *La Savoie,* due here next Saturday. The latter has 95.4 mm. more and 130 mm. stroke. Juhaz, an Hungarian-American, will be its pilot.

The Lancia light car racer is also on *La Savoie.* There arrived Wednesday, however, a standard Lancia runabout, which will also be shipped to Savannah. W. M. Hilliard and his crew left for the course on Tuesday, taking with them the Lancia which competed in the Sweepstakes, so that the Hol-Tan camp will have three cars at its disposal. Perhaps of the racing reputation of its builder much is expected of the Lancia.

The Work of Unloading the Foreign Racing Craft Upon Their Arrival at Savannah.

FORECAST OF WHAT FRENCH MAKERS WILL EXHIBIT

By W. F. BRADLEY.

PARIS, Nov. 5.—It will be a rather more modest Salon than usual that President Fallières will throw open to the public on the morning of November 28. After the ultra-voluptuous decennial, the organizers have decided on an economical exhibition, and though the show has no difficulty in holdings its unique position as a fashionable spectacular display, the light of the eleventh annual will be dim in comparison with that of the tenth show. The decision to hold an economical show meant the abandonment of the temporary building on the Esplanade des Invalides and the splitting up of the Salon into two distinct exhibitions, the first devoted to pleasure cars, the second to all commercial applications of the automobile.

Paris, with all its advantages, has no hall large enough for the housing of the most important trade exhibition of the country. It is true that the Galerie des Machines is empty, but the Salon organizers are artists who would as soon think of draping the Champs Elysées in black as housing their polished chassis in the monster steel and glass house on the Champ de Mars. Consequently pleasure cars will occupy their usual palatial hall November 28 to December 13, and eleven days later the doors of the same hall will be flung open to an exhibition of machine tools, gas engines, marine engines, stationary power plants, commercial vehicles—in fact, every branch of the automobile excepting the pleasure vehicle.

Clement Dirigible Sailing Over the Church of the Madeleine, Paris.

Decorations will be modest—comparatively. This, however, will not prevent the organizers spending more than any other body holding an auto show; but the difference between 1908 and previous years is that individual exhibitors, instead of being encouraged to adorn their stands with fine metal work, crystal, and gold paint, will be asked to refrain, and unlike previous years, will receive no special mention or award if they spend several thousand dollars on triumphal arches.

Feature Will Be Attention to Small Cars.

The distinctive feature of the Salon will be the attention paid by large firms to the production of small, low-powered, moderate-priced touring cars, runabouts and taximeter cabs. In previous years small firms and newcomers to the industry filled the small car class, the world-renowned firms being still too busy with rich customers to pay any attention to the man of moderate means. There are a large number of small firms and a few big ones that have tackled the problem of presenting a satisfactory two-passenger runabout with a single or two-cylinder engine at a maximum of $1,000. Several of them get as low as $800 for a one-lunger carrying a couple of passengers, but with two exceptions these are small, unknown firms.

The big houses are interested in the light touring car or runabout from $1,000 to $1,800 and, almost without exception have gone into this branch of the business with a set of cars which, although the most remarkable feature of the European industry, are altogether unknown to America, the heavy customs duty keeping them out.

Thus Renault has brought forth a two-cylinder 8-10-horsepower, two-passenger runabout. Such a move on the part of the Billancourt firm is not surprising, for while building a car de luxe, they have never neglected the small fry. The new model has an engine with two vertical cylinders in one casting measuring 75 by 120 bore and stroke, differing only in a few details from those in service all over the world on taxicabs. The only important change apart from dimensions is that in place of three-quarter elliptic springs at the rear semi-elliptics are used. The motor has the oil level regulator fitted for the first time on the large cars this year, and of course high-tension magneto. Anything short of a motor bicycle without a magneto is looked upon as a hybrid nowadays.

In addition to this little car and all their usual models with only detail modifications, Renault Frères will produce a couple of specially light models of 29-30 and 35-45-horsepower respectively intended for fast work with low-tire consumption. Excepting a rather more compact power plant a more inclined steering column, and a special gear box, the cars will be modeled after the usual series with all parts lightened. Comfortable closed bodies can be fitted, but they must be lighter than usual.

The aeronautical engine has undergone some changes since it was first brougbt out, but will now be presented in a definite form. Instead of a fan at each end of the sheet metal housing enclosing tbe motor, there is but one at the forward end, the current on being drawn in being deflected towards the engine hase, passing round all the exhaust pipes, the lubricator pipes, and finally on the exhaust box carried longitudinally under the engine base. The aerial propeller is mounted on the camshaft instead of the crankshaft, thus getting a slower speed without the necessity of speial gearing.

Brasier, Dietrich, C. G. V. (now Charron Limited), Panhard, and Berliet, all firms that have been conspicuous in the development of the powerful and costly type of car, have each brought out a little two-cylinder model, of not more than 12-horsepower, equipped with a runabout, touring car or taxicab body.

Details of One Concern's "Two."

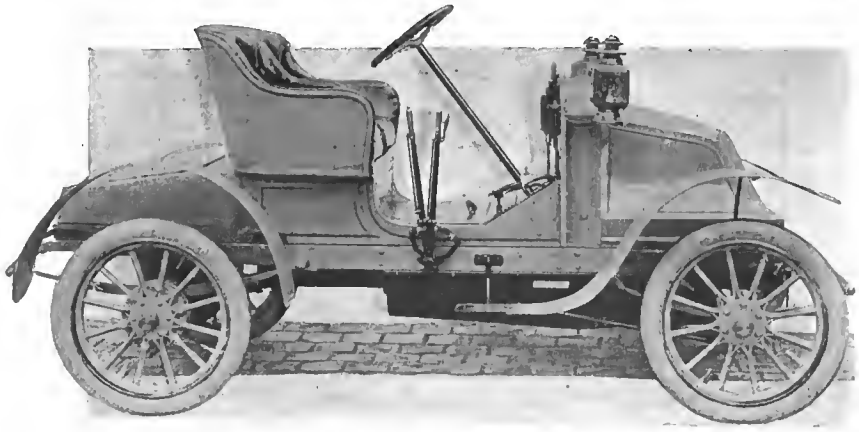
Brasier's "two" is practically a simplified and reduced model of his large cars, the engine being a vertical one of 102 by 120 millimeters, valves on one side, with Brasier carburettor, and Bosch bigh-tension magneto. Water circulation is by thermo-syphon, with fan behind the radiator, and lubrication by gear-driven pump. A leather-faced cone clutch transmits the power from the engine to the gear box, and connection to the rear wheels is by propeller shaft and live axle. Suspension, as in practically all these small models, is by three-quarter elliptics rear and semi-elliptics in front. In addition to this model there will be one on somewhat similar lines woth a four-cylinder engine in one casting, horsepower being about 15. Low-tension magneto on the Brasier, as on a very large number of important European makes, has had to give way to the high-tension type. As the high-tension installation is never accomplished by a reserve ignition, there must be distinctive advantages to account for this wholesale abandonment of the low-tension system.

Dietrich, who has always used chain drive and low-tension magneto, will next year have seven distinct models on three of which the drive will be by propeller shaft and the spark from a high-tension magneto.

Charron has entered thoroughly into the small car business with two rather original models, one having a couple of cylinders, the other four, both in a single casting. In each case bore and

stroke is 3.1 by 4.7, and on both models the radiator is placed on the dashboard, behind the engine, with circulation by thermo-syphon. Accessibility, interchangeability and simplicity have been very closely studied with remarkable results. The gear shifting lever passes direct into the three-speed box, running gear and road wheel brakes are interchangeable, as are also the inlet and outlet water pipes. Suspension is by three-quarter elliptics at the rear, and of course the armored wood frame has been abandoned. It is rumored that on the large models there will be a new device giving direct drive on all four speeds; no official confirmation of this can be obtained, however.

Panhard has a two-cylinder model in hand, but is not inclined to talk about it at present. The novelty of the pioneer firm, however, will be the adoption of the Knight silent engine, invented by Charles V. Knight, and built for several years by Knight & Kilbourne, of Chicago. Daimler, of England, has taken up the patents and will apply them to all 1909 models, while Minerva will do the same in Belgium. The Panhard firm refuses to divulge its intentions and even declares officially that it will have nothing new at the Salon. But as the Knight engine has been under test for the last six months, it is more than probable that the patent will be applied to at least some of the 1909 models. Fiat is declared to have the same patents under consideration for Italy.



Renault Two-cylinder Runabout, to Be Shown at the Paris Salon.

Berliet, who up to quite recently had nothing smaller than a 25-horsepower machine will have a two-cylinder shaft-driven car of 8-9-horsepower, a four-cylinder 15-horsepower model with shaft drive, and a 22-horsepower with the same characteristics. Low-tension magneto is abandoned for the hight-tension type, and a new system of force feed lubrication is adopted to all models with the exception of the 60-horsepower four-cylinder.

Itala Changes from Low to High Tension.

Itala also has changed over from low-tension to high-tension magneto on all models, including the four-cylinder 14-20-horsepower light chassis intended for a town vehicle or light touring car. Isotta-Fraschini will be in the light car business with a small four-cylinder having engine in one casting, and final drive by cardan shaft.

Darracq has a series that varies from a one-lunger voiturette selling at $700, complete with two-passenger body, to a six-cylinder extra long chassis at $3,200, Paris prices. The gear box on the rear axle, which is a feature of the taxicabs now in use in New York, is a thing of the past so far as Darracq is concerned. The new cabs will have their three-speed gear box mounted on the subframe, immediately behind the cone clutch and connected to it by a short shaft and universal joint. The clutch spring is within the forward end of the gear box, contained within a sleeve directly acted upon by the clutch pedal. Special provision has been provided against the leakage of grease out of the gear box. Lubrication has been improved by the adoption of a mechanically driven Dubrulle lubricator operated off the camshaft, in place of the pressure-fed lubricator at present employed. The changes of the cab chassis apply also to the smaller touring cars, with the exception that there is no universal joint between the clutch and the gear box. Three-quarter elliptic springs will be used for the rear suspension of all models, and the change speed lever under the steering wheel will be abandoned on all but the voiturettes.

Mercedes follows the general line of motor evolution by producing a shaft-driven model for 1909, the engine of which will be a four-cylinder of 3.5 by 4.7 bore and stroke. Ignition is by Eiseman high-tension magneto, valves are on opposite sides, and cooling is by honeycomb radiator. Four speeds are provided by the selective type of gearbox, with direct drive on the fourth. A couple of torque rods lead from the universal joint casing to points on the rear live axle near to the road wheels; the differential gear is in the same plane as the propeller shaft, the drive being by double bevel gear.

Six-cylinder models will be shown, but they will probably be less in numbers than at any previous exhibition. The six-cylinder engine never really caught on among Continental automobilists, and now that fashion has turned toward lighter and low-powered machines there is less demand than ever for more than four cylinders.

In brief the tendency of 1909 will be towards light four-cylinder touring cars, with bloc casting for the smaller models; high-tension ignition by magneto only for all but the largest cars; water circulation by thermo-syphon below 15-horsepower; gear-driven lubricators on all models; shaft drive on all but the largest models; suspension by three-quarter elliptics on all models.

Marine and Aero Motors.

At the industrial show special attention will be paid to the development of the marine motor, a large official stand has been secured with the object of pointing out to constructors the possibilities of business in the application of internal combustion motors to fishing boats and the various type of pleasure craft. It is not likely, however, that very much of interest will be shown on the stands.

In the aeronautical section there will doubtless be some interesting exhibits. Most of the leading constructors have devoted attention to the production of engines for aeroplane work.

Clement's Essay Into Aeronautics.

PARIS, Nov. 5.—Adolphe Clement, millionaire automobile constructor and head of the great factory on the banks of the Seine, has met with unusual success on his entry into aerial navigation. After several months' quiet serious work the mechanical portion of the world's finest airship was produced from the Clement-Bayard factory simultaneously with the completion of the balloon part at the Astra works. The two parts were connected, and as a trial trip the *Clement-Bayard* soared over Paris, making stoppages and performing evolutions at the most important centers, then passed over the owner's automobile factory and the one owned by his son-in-law, Ferdinand Charron. For the second outing a record journey of 160 miles was made in five hours. The *Clement-Bayard* is constructed on the same general lines as the *Ville de Paris*, and is without doubt one of the fastest airships in existence. The gas bag was made of material furnished by the Continental Tire Company, and is of two distinct portions. The power plant consists of a Clement-Bayard racing engine, with four cylinders, developing 120 horsepower, and driving a huge two bladed propeller at the forward end of the steel cage.

ABOUT AUTOMOBILE SPRING SUSPENSIONS*

By THOS. J. FAY, President Society of Automobile Engineers.

LIFE of a spring is forecast by the maker thereof, almost independently of the quality of the material. If the spring is limber and it is so placed as to indicate spring play, just at the point of reversals of camber, the life will be shortened. The superior grades of materials will stand this abuse for a comparatively long time, but the dynamic life of steel, like the life of every other animated thing, is limited. Inferior materials, advantageously situated, might last far longer than the superior products working at a disadvantage. The initial camber to give a spring for a given static camber, is a problem for the spring maker.

Figs. 8, 9 and 10 show three views of a given spring, under the conditions as follows:

(a) The spring under static load, indicating the static camber;
(b) straightened out under load;
(c) in reverse camber, in a testing machine, to the limit before permanent set.

It is worth while to study these three conditions in relation to springs, because they have to do with the life of the spring in service, and the easy riding qualities of the car due to spring action. It might be said in general that the greater the difference between the initial and the static camber, the more pronounced will be the easy riding qualities, and it might be said as well that the greater the initial camber and the greater the possible reverse camber, the better will be the life of the springs, especially if we take into account that the spring action in service will be limited

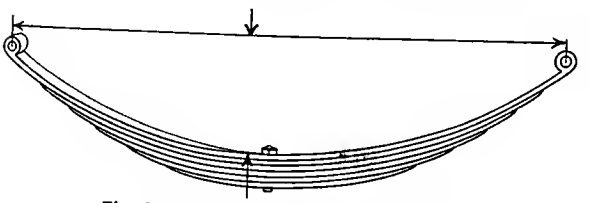


Fig. 8—(a) The spring under static load.

between the two points, as represented by the initial camber on the one hand and the condition (b), which means that the spring leaves will no more than straighten out in actual service. If the service conditions are such as to eliminate any reversal of camber, then it may be said the factor of safety will be represented by the amount of the reverse camber in a testing machine before permanent set.

If springs are limited in their applications to the conditions as before given, even though these conditions may be regarded as favorable, it may still be said of the springs that their life is limited. The life, in fact, under a fixed set of conditions, will depend entirely upon the kinetic ability of the materials used (dynamic qualities of the steel). This is a matter that has been exploited at some length in the press and on the marts of steel, but to almost no purpose, since, forsooth, springs do break and the breakages are not limited to the kind that are cheap and claimed to be non-dynamic in their character.

At the present time every particle of steel that goes into every automobile, regardless of price, is said to be of a dynamic character and toughened by a "special process" whether it is or not. It is rather to be feared then that this word "dynamic" has been relegated to a low estate. Notwithstanding the apparent tendency to class everything by way of steel that finds its way into cars as the very best obtainable, the fact remains that some of the material is truly good, and when it comes to the material for springs, which is the affair of the hour, kinetic qualities are those desired, if the life of the springs shall be long, provided the easy riding qualities are present in the spring suspension. This must be so,

*Continued from page 638 of The Automobile, November 5.

since, as before stated, easy riding qualities are present if the steel is subjected to a fiber strain not far from the elastic limit, and so it follows that steel flexed repeatedly and continuously, under conditions nearly approaching the elastic limit, will not last long unless it is of a character extremely kinetic.

The exact physical properties of the several grades of steel will be accorded a due measure of attention in connection with the part of this article specifically dealing with materials. For the

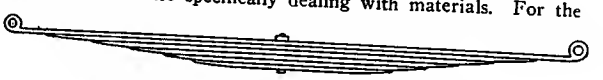


Fig. 9—(b) The spring straightened out under load.

present it will be well to consider one or two other points. For instance, a laminated spring of the flat plate variety must be so designed that each one of the leaves, regardless of their lengths, will be subjected to exactly the same fiber strain as its neighbor for the respective conditions of camber. This is rarely absolutely true, and the conditions here imposed are oftentimes violated, proof of which lies in the fact that plates will break out of the middle of a spring and the spring will work better without the broken plate than it ever did before. This merely illustrates the fact that the broken plate was doing nearly all the work and served for the most part as a mischief maker, merely because the broken plate was given a greater initial camber than the occasion demanded. Mathematically and in practice, if the spring plates are all of the same thickness they should all be bowed to the same radius, and if they are so bowed the fiber strain will be the same in all for every condition of camber to which they are all treated.

It is easy enough in practice to fix the initial camber for the various lengths of plates, if they are all of the same thickness, since they can all pass through the same bending roll, if they are all to be of the same radius. This is not to say that the best springs will come from the practice of making all of the leaves the one thickness, since it would be possible to get more work out of the springs were the leaves decreasing in thickness as they shorten. With decreasing thickness of leaves we may have increasing camber as they shorten, hence increasing pressure and greater work. It may not be generally understood, and it may be well to point out, that the efficiency of a spring is measured by its ability to transform energy. This was intimated in the entering chapter, but we can go a little farther and say that the spring action is even at the expense of the power of the motor,

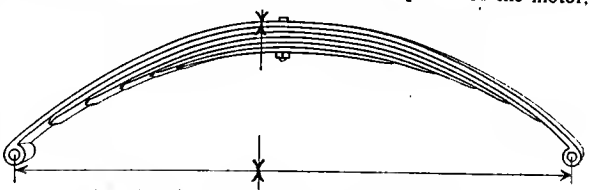


Fig. 10—(c) Reversal of camber to point of set.

and the more power the springs will absorb the easier will be the riding qualities of the springs. What is wanted in a spring is the ability to destroy the energy of the moving mass insofar as it can, by way of defeating easy riding qualities. We do not wish to have this energy destroyed instantly, but rather at an increasing rate for each increment of travel. We accomplish this more perfectly if the spring plates are made thin as they are made short.

There is no actual limit to any type of spring, from the mere point of view incidental to indifferent service; if, however, easy riding qualities are desired, or, if spring failures are to be eliminated, it is then that limitations of the types will have to be

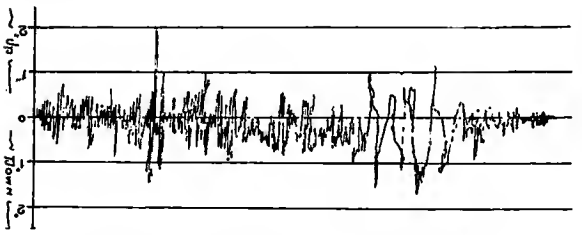


Fig. 11—Showing record of bumpometer test.

considered. Take, for instance, the helical spring, placed in such a way as to take care of the vertical bounce of the body, and it is plain to be seen the spring may snub the load within the required limits of travel, but the pendulum action will be at a high periodicity. Obviously, it would be disagreeable riding under such conditions, because the number of oscillations of the body would be very high indeed. It was found in practice that this very low priced and practically unbreakable type of spring could not be utilized, because it engendered extremely disagreeable motions.

The concord type of spring (used extensively in connection with the little Oldsmobile), known in the Far West as the "buckboard type," is probably the most easy riding spring extant. It has always been used in connection with short wheelbase vehicles, and its limitation is that due to wheelbase. The successful application of this type of spring has nearly always been in connection with vehicles of a wheelbase not exceeding 72 inches, and now that automobiles, even of the runabout type, are designed with the wheelbase considerably exceedingly 72 inches in nearly every case, this type has become almost obsolete.

In the cars of the time it is a question of laminated plate springs, full, three-quarter, or half elliptical, as the exigencies of the service would seem to demand. Designers split on these differences, and some designers resort to the scroll as a further means of engendering easy riding qualities. The author has had occasion to observe road performance in automobiles in connection with racing cars and as this road performance relates to the more important types of touring cars, these observations have invariably resulted in the conclusion that full elliptical (rear) springs, with a scroll top section and rather stiff lower section, would more nearly afford a level platform than might be obtained in any other way. Next to the full elliptical (top scroll) rear spring, it is possible that the three-quarter elliptical (scroll quarter) would afford more nearly the perfection desired. Unfortunately, these types of springs do not readily lend themselves to the design of cars, if a low center of gravity is sought, and certainly a low center of gravity is of the utmost importance.

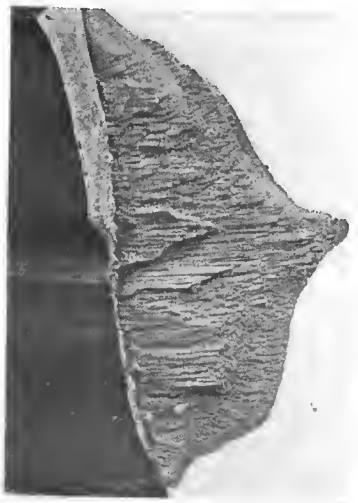


Fig. 12—Fracture of Krupp steel in a test, showing long fiber.

From the point of view of types of spring, the tendency may be to disregard the condition of service, and regard the type as dominant.. It is not absolutely necessary to resort to the use of full or three-quarter elliptical rear springs, because the application of skill will render it possible to obtain easy riding qualities with the half elliptical springs in the rear in connection with cars with a low center of gravity and devoid of over much top hamper. The question of where the weight is placed is quite as important as the result of the center of gravity. For instance, in limousine the resolved center of gravity can be low enough to escape criticism; even so, a considerable proportion of the weight can be concentrated high above the base line, and that proportion of the weight will be in evidence, by way of excessive "heel" when the car is doing a curve. Flywheels, for instance, have their weights concentrated at the rims, because the flywheel effect is the maximum under such conditions, but the center of gravity of a flywheel, if it is kinetically balanced, will be at axis of rotation. This same phenomenon can creep into body work, and it is plain that center of gravity is not all to be watched.

The spring performance will only be up to the springs as a matter of design, if the design of the car as a whole will render it possible to take advantage of the good qualities of springs. Under proper conditions the half elliptical type of spring will afford easy riding qualities, and a periodicity of the oscillations said to be agreeable by even the most fastidious. A modification of the half elliptical spring is that known as the platform type of spring, in which, in addition to the two half elliptical springs in the fore and aft plane, a third half elliptical member is placed in a lateral position, suspended from the after end of the two half elliptical members above referred to.

If top hamper causes lateral heeling in connection with the half elliptical springs, except in an ordinary way, this disagreeable property is far more noticeable in connection with the platform type of springs. The body is suspended to the lateral member of the platform members, and the spring action is therefore that which would engender lateral rolling if very much of the total weight is above the chassis frame. On the other hand, platform springs when properly designed and suitably placed, afford the very easy riding so much to be desired in connection with the road performance of automobiles.

Fig. 13—A secure spring clamp.

Up to the present time we have made no mention of the spring suspension at the front end of cars. At the front end the problem is different, because there the load is almost constant. If the motor is placed in the front the load will be scarcely varied at all, due to the presence or not of another person besides the chauffeur in the remaining front seat.. With the motor in front the chauffeur's position is so far back in the direction of the rear spring suspension that the difference of one person but little affects the weight actually resting upon the front springs. In front, then, it is very possible to take advantage of the half elliptical type of springs, since they lend themselves perfectly in every case, if only the weight is constant and the springs are designed taking that weight into account. In a very few cases the three-quarter elliptical springs have been used in front, and, while there is no great objection to the use of this type of spring under the conditions involving a constant load, there is a probable increase in cost to take into account, and *an expenditure can scarcely be justified in anything unless in connection therewith an advantage is afforded.*

There are types of springs that combine the regular functions, with special features, perpetuating the shock absorber idea. These springs will be illustrated in connection with shock absorbers, and since they are normal products from the spring point of view, they will not be given space here.

THINGS AN AMATEUR DRIVER SHOULD KNOW

By A. D. HARD, M. D.

IN the Middle States and in the Great Northwest, the number of automobile drivers who are owners of their cars is increasing very fast. The so called "middle class" are now buying automobiles with a rush, and the output of the manufacturers is an index of the nature of the market. The four-cylinder touring car of from 20 to 30-horsepower is in demand by people who will drive their own cars, and the sale of them will be immense. One of the great objections to the purchase of an automobile has been the prospective expense of a chauffeur.

The man who can easily write out his cheque for thousands in payment for a car that his wife asked him at the breakfast table to buy, expects to employ a chauffeur and does not care to become familiar with the mechanism of his car. But the man who has to worry some to get together the twelve hundred dollars or so with which to buy a car, must drive it himself, and must *know his car.*

Learn the Carbureter Thoroughly.

There are some very simple things involved in the structure of an automobile that are seldom considered or understood, and yet they are of prime importance to one who is to drive his own car. Carbureter construction and the reasons therefor are not often studied, and yet the carbureter is the heart of the automobile.

The large number of designs, all calculated to accomplish the same purpose, shows conclusively that the men who study this matter are not settled upon the best mechanism for feeding fuel to the combustion motor. We all know that we wish to get a uniform mixture at all speeds which will give the greatest power and least waste of energy in the form of heat that is possible. The driver should know how his carbureter is calculated to work to accomplish this purpose so that he may intelligently adjust it as may be required, and know what to do when it fails to work properly.

The in-rushing air produces a spray from the discharge nipple very much like that from a common atomizer used in medicine. The fine particles of gasoline are thus brought in contact with the air in a favorable way to be rapidly converted into vapor, and this vapor mixing with the air produces the explosive or combustive mixture.

If the Discharge is Too Free.

If the discharge of spray from the gasoline nozzle is too free, the particles will not be all vaporized, and will be deposited on the inner walls of the intake pipe as liquid gasoline, and the portion which enters the combustion chambers of the motor will be vaporized by contact with hot surfaces, and a too rich mixture will be formed to readily ignite or to give the best discharge of energy.

If it does ignite under these conditions, it only partially changes to an elastic gas having a much larger volume, because there is not enough oxygen at hand to furnish the carbon atoms with their required portion. The results will consist of lack of power, production of black carbon laden smoke, and fouling of the cylinders, all undesirable and easily avoided if we know how to meet the condition.

It is well that we should understand that all substances are composed of unit particles called molecules, and the relative nearness to each other of these molecules determines whether the substance is solid, liquid, or gaseous.

If a gas be compressed so that the molecules come in contact, the substance will no longer be a gas, but will take either a solid or liquid form.

If the molecules of a combustive gas be compressed until they are much nearer together than in the natural state, but not near enough to become a liquid, they ignite much more rapidly than before, because combustion heat can more readily pass from one molecule to another. Not only will they ignite quicker, but the liberation of energy will be greater in volume, and this is the reason we demand compression in the cylinders of a combustion motor.

One of the incidental features of this compression is greater facility for the ignition spark to follow other paths than the spark gap of the spark plug. This is an undesirable feature, and must be taken into consideration in securing perfect ignition of the combustion charge in the cylinder.

Trying the spark on the outside of the cylinder with no compression to influence it is not a correct exposition of its efficiency in producing desired results in the cylinder. It may spark beautifully when under observation, but when returned to the cylinder no perfect result may be attained.

The fault is usually due to the spark points of the plug being too far apart for anything but outside explosions. The points should be placed as close together as possible without being liable to fouling by small particles of carbon. Closeness of points not only favors production of sparks under compression, but it interposes less resistance to the current passing across the gap, and thus makes it less liable to follow some other track, with absence of the ignition spark.

Adjustment of the Vibrator.

The adjustment of the vibrator on the spark coil is always a matter of various ideas. The principle involved is that the primary current must be made and broken *completely* in rapid succession.

If it is so adjusted that when the points are apart there is still a flow of current from small particles between them, the indication is to *increase* the distance. If the points are in this close condition which favors a leak across the gap, the battery will be partially short circuited, and dry cells or storage battery will quickly loose their charge.

This is the explanation of much of the fault finding of those whose batteries quickly give out. They think that if the buzzer does not buzz they do not need to turn off the switch when the car is not in use. And, furthermore, the current is continuous to some extent when the car is in use, when it should be perfectly intermittent.

These three points of adjustment are of prime importance in knowing how to run an automobile. The fuel discharge from the carbureter nozzle, the points of the spark plug, and the points of the vibrator.

It is a mistake for a driver to ever try to correct an apparent fault in a coil. There are no reasons for a coil to refuse to work that can be remedied by an ordinary mechanic, except it be some outside connection. If the coil is so that a current will not pass through it, either the primary or secondary part, it is always due to burning out, and calls for a new coil at once.

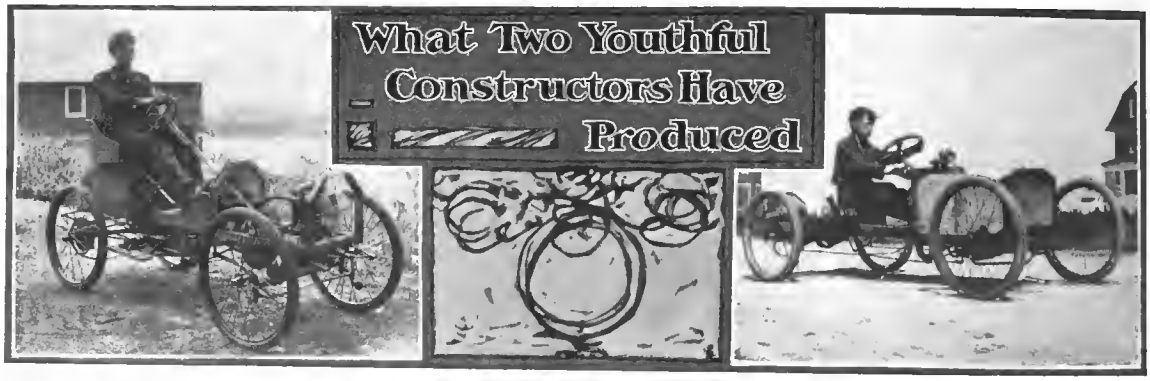
In the correction of all automobile faults, the greatest and most common error is in not properly locating the trouble before trying to correct it. Indiscriminate and misdirected changing usually gets farther away from the correct condition than at the beginning, and makes the job more difficult for even an expert.

When the Motor Gets Lazy

It is high time to look for the cause. It may be for no great reason, but lack of lubricating oil in the crankcase is a serious matter and oftentimes it is just this absence of oil that is at the seat of the trouble.

If the matter is not attended to on time and the motor stalls, it will be well to "crank" until the bearings cool down. If the bearings are allowed to "freeze" the trouble—for a road problem—will be beyond the ingenuity of the average autoist.

Sometimes it is kerosene oil—put into the cylinders—that seeps back into the crankcase, and kills the lubricating qualities of the crankcase lubricant. In such an event to drain off the oil and replace it with a fresh supply is the natural thing to do.



C. A. Byers in His Home-made Car.

H. L. Gray and the Steamer He Built.

WHAT A YOUNG CALIFORNIAN HAS BUILT.

Editor THE AUTOMOBILE:

[1,621.]—Bries Cowan, fifteen years of age, of Los Angeles, Cal., is probably ths youngest automobile manufacturer in ths world. At least, it is a safe wager that no other boy of his age, handicapped at the start by ths lack of mechanical training, as he was, has built, unassisted, an automobile that for speed, hill-climbing, and all other purposes is a greater marvel than ths one recently completed by this Los Angeles youth. He began working on the machine about eightsen months ago, at which time he was only a few months past fourtsen years of age. He had had no mechanical training of any kind, and, consequently, many discouragements were his first rewards. His persevering nature at length won, however, and with a real automobile of his own make, which he calls ths "California Midget," he is the envy of all the boys.

The "Midget" in general design somewhat resembles the large factory-made touring cars, although of miniature proportions. It is six feet in length and weighs about 300 pounds. It has an Aster engine of three-horsepower, and is capable of making a speed of from 25 to 30 miles per hour. It has a friction transmission and a double chain drive, is air-cooled, ths battery control is through an electric light switch, and ths differential operates successfully. It has a tread of three feet, and has external brakes on the rear wheels. It carries two gallons of gasoline and will run 25 miles on each gallon.

Only his spare time was devoted to the construction of ths "Midget." The entire machine, except the engine, including even ths wheels, is of the boy's workmanship. Ths materials and engine cost about $150, all of which was earned by ths youthful builder.

CHARLES ALMA BYERS.

Los Angeles, Cal.

TIMING TROUBLES WITH A 6-CYLINDER MOTOR

Editor THE AUTOMOBILE:

[1,622.]—As I am a reader of The Automobile and have a six-cylinder machine,

How do you time a six-cylinder motor when they fire 1-5, 3-6, 2-4?

Buffalo, N. Y. READER.

With the idea of being sufficiently explicit, attention will be called to the mean average valve timings as set down in the translation by C. B. Hayward (The Automobile, Nov. 5, 1908, page 649), as follows:

	Mean Av'gs.
Lead given the exhaust valve	46° 20′
Lag in closing inlet valve	25° 32′
Advance of the ignition	31° 15′
Lag in closing exhaust valve	5° 8′
Lag in opening inlet valve	12° 16′

Having in mind correct timing for the first cylinder incidentally fixing the range of the spark advance to give late firing and cranking, and the balance of the range (all possibles) to go for early ignition. With the first cylinder timed as to lost motion of tappets and ignition, crank to number five and go through the same operation; thence to number three and repeat the operation; likewise to number six, two, and four, respectively repeating the timing operation as you go along. In other words, proceed as in the order of firing, treating each cylinder as if it were a single cycle motor.

THE STEAM CAR OF NEW YORK CITY BOY.

Editor THE AUTOMOBILE:

[1,623.]—I enclose photograph and short description of a machine I constructed during my vacation, thinking ths same might prove of interest to some of your young readers.

Ths power plant consists of a 3 1-2-horsepower, two-cylinder, double-acting steam engine, with a bore of 2 1-2 inches and a stroke of 3 1-2 inches. This engine is supplied with steam by a 14-inch fire tube boiler heated by a burner, using either gasoline or kerosene. The boiler is placed under ths hood and between it and the dashboard is the water tank, which holds six gallons.

Ths engine is located under the seat in a horizontal position with the cylinders forward, and is connected to the rear axle by a short chain. The gasoline tank is in the rear and holds three gallons.

The frame is made of angle iron braced by truss rods. My front springs are three-quarter elliptic and my rear springs are one-quarter elliptic. The wheelbase is 78 inches, and the tread is 44 inches. The wheels are 28 by 1 1-2, wire wheels, the front ones being slightly dished. I use one-wheel drive to avoid the necessity of a differential. I carry between 150 and 200 pounds steam pressure. The gear ratio between my engine and my rear axle is 1 1-6 to 1, which makes it a fast little car.

I can make between 25 and 30 miles per hour. Even with this high gearing, it has sufficient power to carry three persons, and is a good hill-climber. I reverse by reversing my engine.

New York City. H. LIGGETT GRAY.

P. S.—I am fourteen years old.

THAT TROUBLE OF THE MAN FROM DULUTH.

Editor THE AUTOMOBILE:

[1,624.]—I believe the contributor of letter No. 1,601 from Duluth will find his difficulty in a short circuit; i.e., when No. 1 is firing, No. 2 is doing likewise, or something similar to that.

Worcester, Mass. P. W. WOOD, JR.

Editor THE AUTOMOBILE:

[1,625.]—In re letter No. 1,001, issue October 29, "Puzzling Knock When Climbing on ths High," "Subscriber's" trouble seems to be in improper carbureter adjustment for low piston speeds. Undoubtedly his trouble disappears when he drops back into second speed and the motor runs faster. If there is anything wrong with the transmission (i.e., everything from clutch to rear wheels), it probably is as noticeable in second speed as when driving "in ths high." Ths carbureter on "Subscriber's" car is probably adjusted properly for normal and high piston speeds and when he attempts to negotiate a grade on the high, and the motor slows down, ths partial vacuum caused by the downward stroke of the piston is insufficient to aspirate the necessary gasoline from the spray nozzle for a good mixture, causing the "very weak or about half as strong explosion" he mentions. Of what benefit is a wide-open throttle if the needle valve on the carbureter is not open enough?

Hope this will enable him to "value the car $200 higher."

New York City. D. C. H.

Editor THE AUTOMOBILE:

[1,626.]—Replying to my own letter, No. 1,601, I am pleased to state ths cause of this kick. It was caused, apparently, by a weak explosion. The car was equipped with Schebler D carbureter made for the car. After spending about $100 at everything else, the D carbureter was replaced with an E special, of the same make, as an experiment. Result: twenty more power, and will pull till dead without a miss. Why the D carbureter failed I know not.

Duluth, Minn. SUBSCRIBER.

LETTERS INTERESTING AND INSTRUCTIVE

ONE CARBURETER SHOULD DO THE WORK.

Editor THE AUTOMOBILE:

[1,627.]—I find your lettere eo very instructive that I write to eee if anyone can give me an idea ae to why my two-cylinder oppoeed Apperson engine will keep missing explosions after I have tried everything on earth to overcome it. Now, to be sure it was not the spark at fault, I went all over the wiring and changed it to almost new wire throughout, and so I am certain that it is not the wiring, the batteries, or spark. I put heavy rubber hoee over the secondary wire to make sure. I uee two Schebler carhureters and have taken them off and cleaned them thoroughly, and also took out the intake valves and put in new springs with the same tension. So this ought to he O. K. I have tried every adjustment possihle in the carhureters, even from a lean to a very rich mixture; even adjueted them singly, while only one cylinder was running; then let the two run, and tried all ways of adjueting.

The strange part of the deal is that each cylinder, running singly or alone while I hold down the other vihrator, will not miss at all, and at any speed. But just as eoon as I let up on the spring and allow both cylinders to fire, then it commences to miss, and will keep it up for an all day's run, hut will not miss as had when running on the road with throttle full open, hut still mieeee a good deal. The above usually would ehow lean mixture, hut in thie instance it eeems not to be the caee, ae I have tried it with a mixture

Mr. Lane in His Apperson Equipped with Two Carbursters.

so rich the water would holl in five or six miles and still ths engins would miss. Now, the above is a sticker for us all here, and I am very anxious to know what causes it. If anyone has ever had a like trouble, I wish they would give us their experience with it and ths cure. The very strange part of it is why each cylinder will run so good singly, and, then, as soon as hoth are turned on, they miss, and it does not seem to be one all the time missing, hut both seem to miss.

West Liherty, Ia. V. R. LANE.

The writer experienced the same kind of trouble and shook it off in the following manner:

(*a*) Removed a defective timer.

(*b*) Removed one carbureter and arranged the remaining carbureter below the motor and with equal length of intake piping to respective cylinders.

(*c*) Made sure of the battery.

(*d*) Replaced the coil with a good one, using a master vibrator.

Result: the performance is thoroughly good in every way.

COMPOSITION FOR COATING BRASS.

Editor THE AUTOMOBILE:

[1,628.]—Please let me know what the hest composition is for coating hrass to he put away for the winter. W. K. BAYLESS.

Lexington, Ky.

Lacquer would, of course, be fine; beeswax is good; cylinder (a pure mineral) oil might do. There is still one other way of preventing bright work from taking on a heavy black coat that is difficult to remove, besides destroying the highly polished surface. Saturate cheesecloth with clarified light mineral oil and wrap the parts in the same, or the cloth around the parts.

CHARACTERISTIC BEHAVIOR OF ELEMENTS.

Editor THE AUTOMOBILE:

[1,629.]—Will you kindly let me know the formuiæ for H and O for the hest combustion in an explosive engine? Can you give me any idea of how many pounds of water would he required to operate the average 20-horeepower gasoline engine giving 20 horsepower, if it were poeeihie to decompose water for this purpoee?

If it were possible to decompoee water by passing it through red hot pipee, what would happen to the H and O? Would they both come out fixed gases? Or would the O form an oxide with the iron and be consumed? What proportion of air would he neceesary to he mixed with the H to form an explosive mixture? Not taking into account the cost of decomposing the water, do you think it possihie to get the correct mixture for an engine in this way? At what degree of heat is H and O decomposed?

In hurning H in the open air would a hotter fire be the result, with air under pressure? If so, about what pressure? If hy hurning a pint of keroeene per hour it were possihie to completely vaporize one gallon of kerosene, ready for mixture with the air for an explosive mixture, and hy a neat little device which could he placed under the hood of an automobile alongside of the engine, do you coneider euch a device would help bring kerosene into use in explosive engines? Or are all manufacturers satisfied with gasoline, and the present system of vaporizing? H. T. E.

Nyack-on-Hudson, N. Y.

Confining a mixture to H and O, the product of combustion would be water, the formulæ for which is H_2O. The value of the second question is not apparent; water is in a state of finality, as respects the relations of the components. You would have to use coal and an electrolytic process to split the water into its components; you might better use the coal direct.

Water, in contact with a red hot pipe, makes steam. This steam, separated from any water, superimposes a superheated state. Superheated steam is not a permanent gas. Not considering the final effect of superheating steam from a point of view of the separation of the components, it is enough to say that a point is first arrived at under the conditions in which the steam ceases to be valuable for power purposes. In steam automobile practice, and in recognition of this fact, the pressure is kept below 600 pounds per square inch.

Obviously the components of water are hydrogen and oxygen. These elements, isolated, are in gas form, and in a state of finality; hence they are fixed gases. Oxygen will form with iron to produce iron oxide at a temperature and under conditions involving the iron compounds during the selective freezing period. You cannot, therefore, expect to form oxide of iron (excepting as a surface indication) at low temperatures. Hydrogen will burn with enough oxygen to form water, the formulæ for which are above given, and if the oxygen is to be taken from the air it must be in the ratio of H_2O. Water is not decomposed in practice unless by the electrolytic method. In the decomposition of water by the electrolytic method, reference may be had to the experiments by Lord Layleigh, briefly as follows: "Hence one ampere liberates .00001038 grams of hydrogen. The strength of the current, in electrolytic bath, for any value of the hydrogen, may be set down as follows:

$$I = \frac{\text{weight in grams of H. per sec.; liberated}}{.00001038}$$

and in the abstract

$$I = \frac{\text{weight of any element in grams, liberated per sec.;}}{.00001038 \times \text{chemical equivalent of that element}}$$

when I = the current in amperes."

The current in ampheres that would liberate 1 gram of hydrogen would simultaneously liberate 8 grams of oxygen. The actual power required in the process would depend upon the electromotive force of the "couple" involved. Taking into account the electromotive force (counter) then, determining the electromotive force necessary, in view of the resistanc of the circuit in ohms, the potential difference can be ascertained. With the potential difference in volts it will then be possible to deter-

mine as to the power required to liberate hydrogen and oxygen. The practical formulæ for the determination of these values would look as follows:

$$W = E\,I \qquad W = \text{energy in watts}$$

$$\text{H. P.} = \frac{E\,I}{746} \qquad E = \text{electromotive force in volts}$$

$$I = \text{current strength in amperes.}$$

You will observe from the information thus far given that your proposition entails some complexities, and is more of an undertaking than can be disposed of in a limited space. A sufficient insight is here given to enable you to intelligently drop the subject, or serve as a clue to further research.

In burning hydrogen a hotter fire would be the result of the mixture under pressure, because for a given mixture the greater the pressure the greater would be the quantity of the hydrogen present. Since hydrogen is a fuel under certain conditions, the more you have of it the more heat will be manifest as the result of its association.

Your last proposition savors of a long journey at the behest of an explosion. There is a great difference as between using liquid fuel, to be mixed with atmospheric air, and your proposition. Feeding vaporized kerosene into a train of atmospheric air en route to the combustion chamber portrays a hazard, since "popping" in the carbureter is sure to follow a mal-condition of the mixture.

Gasoline is a very satisfactory fuel. It is difficult to state the degree of satisfaction entailed; manufacturers will have to put up with it until they find something better.

NEWSPAPER MAIL TO MANILA IS UNCERTAIN.

Editor THE AUTOMOBILE:

[1,630.]—In your issue of April 2 last you have an article on "Successful Experiments with Dry Cells." The article is No. 1,288. It has been impossible for me to get your paper regularly, and the paper with this article referred to was one of those I failed to get. Will you please state the substance of the article in question.

In Letter No. 1,288 you express the wish to learn the experiences of others in relation to two-cycle motors "four-cycling." I installed a 2-horsepower, two-cycle engine in a boat, and upon running the same I judged from the exhaust indications that something was amiss. Further investigation led to the conclusion that the motor "four-cycled" up to the time when the cylinders became warm. After the cylinders warmed up the motor went back to its two-cycle relation. F. H. THOMPSON.

Manila, P. I.

Letter No. 1,288 seems to have been the fag end of a controversy. To rejuvenate dry cells, drill a hole in the sealing wax and spill a solution in through the hole, the same to be made of a one-quarter pound of salamoniac to a quart of water. Each cell will soak up a certain amount of the solution, and if the depolarizer is not neutralized or exhausted, provided the zinc is in sufficient presence, the cell so treated will be revived and serve further its useful purpose.

The experience you relate in relation to the four-cycling phenomenon in connection with a two-cycle motor, is not uncommon before the motor is warmed up in service. It is very likely the details of design have to do with this, since it is not unusual in some two-cycle motors to work code without four-cycling.

RESPECTIVE MERITS OF THE ANTI-FREEZERS.

Editor THE AUTOMOBILE:

[1,631.]—I am a subscriber of your very good magazine, and would say, if I am not in error, I have noticed two articles recently in same regarding anti-freezing solutions. One of these stated alcohol was better and the other recommended calcium chloride. Will you kindly state whether calcium chloride is injurious for this purpose, and if not, what proportion to use? C. A. HOFFMAN.

Ashland, O.

This is a subject that has been discussed on numerous occasions and from various points of view. None of the solutions are so perfect as to render it desirable to exclude water under favorable conditions of temperature. All the proposed mixtures will serve the intended purpose, and the drawbacks are insignificant in proportion to the benefits to be derived. Of calcium chloride there is this to be said: It must be chemically pure, and it must not approach in density up to the saturation limit, considering the boiling point of water, as the prevailing temperature. The greater the quantity of calcium chloride used the greater will be the damage, if the chemicals are not "chemically pure," and if electrolytic action does take place, even if the chemicals are pure, the remedy lies in using as little of it as possible. The chances are a 10 per cent. solution will serve under the most severe conditions likely to obtain in these latitudes, but it will not be practicable to go wholly by the tabular values, of freezing point, for degrees of saturation. The reason for this lies in the fact that water boils off, and as the water decreases the solution becomes more concentrated. Alcohol is treated in another article in this issue.

THE HIGHEST SPEED AT GRAND STAND.

Editor THE AUTOMOBILE:

[1,632.]—Could you tell me in "Letters Interesting and Instructive" about what was the highest speed attained while passing the grandstand in the last Vanderbilt Cup race?

Washington, D. C. H. T. CHITTENDEN.

No two observers will simultaneously reach the same conclusion in relation to the same matter, as it has oftentimes been found. The speed in front of the grandstand attained by the cars in the last Vanderbilt Cup race was variously estimated for different cars, all the way from 80 to 130 miles per hour. As a matter of fact, on hard level macadam road, 90 miles per hour comes close to the obtainable limit. The especially prepared roadbed in front of the grandstand is probably considerably faster than a hard macadam road, but how much faster it is difficult to say. In beach racing, as conducted at Ormond, it is generally considered that a given car will travel about six miles faster per hour than the same car could travel on a hard macadam road. It might be interesting to hear from some of the "stop watch sharps" who may have timed the cars in front of the grandstand.

BETTER "SWAP" CARS IN THIS CASE.

Editor THE AUTOMOBILE:

[1,633.]—As readers of your paper we would thank you for any information concerning two or three speed and reverse transmissions that could be placed in a "roadster" substituting the planetary system.

We would want a transmission that could be used without lengthening the wheelbase or making any other radical change. Our object in asking this is to do away with the noise and excessive grease caused by the planetary system. It would be quite satisfactory to have this answered in "Letters Interesting and Instructive." DESMOND-STEPHAN COMPANY.

Urbana, O.

It is a source of regret not to be able to safely advise users of cars to change the design whenever they find pleasure or anticipate profit in the plan. It is not a project likely to end satisfactorily, and it is, as a rule, better to "swap" cars with some one who wants what he does not possess. "The distant verdure ever looks the greenest."

HOW TO MIX AN ANTI-FREEZE SOLUTION.

Editor THE AUTOMOBILE:

[1,634.]—Could you advise us as to what proportion of glycerine, alcohol and water to be used as a zero fluid to the best advantage, and what degrees they will stand?

MONNIER AUTO & CYCLE SUPPLY COMPANY.

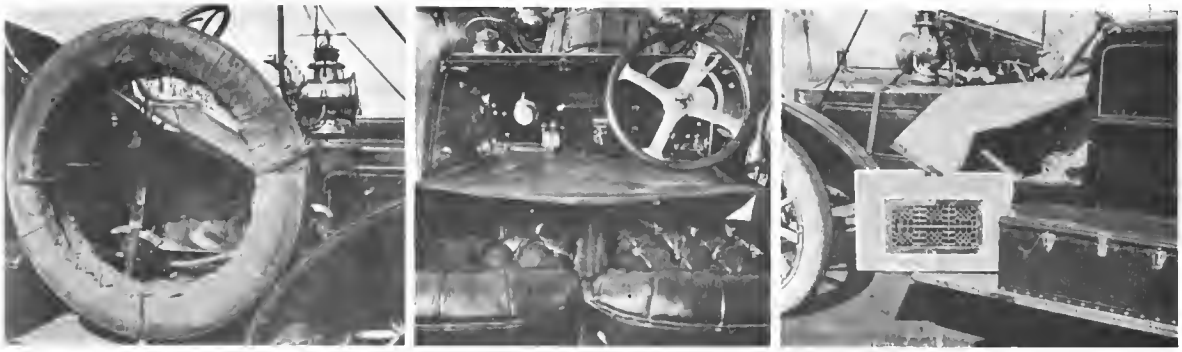
Detroit, Mich.

It is customary to use glycerine and water in equal proportions. This solution will serve well the purpose in these latitudes. Referring to alcohol, enough is to say it should be substituted in place of glycerine, retaining at much water as possible. It is the glycerine that is objectionable in that it attacks the rubber hose joints, and a fair remedy lies in using half water, as above stated, and equal proportions of glycerine and alcohol to make up the other half.

GRAPHITE AS A CYLINDER LUBRICANT.

Editor THE AUTOMOBILE:

[1,635.]—In the October 29 issue of your paper there appeared an interesting question, No. 1,603, concerning graphite as a cylinder



How Mr. Fowler, of Kansas City, Mo., Dispenses with s Lap Robs in Winter in His Packard.

ubricant. As answered by you, graphite is one of the best lubriants known for any purpose, provided it is of the bright variety the same as with oils), and it has been proven by authorities that lake graphite of tbe Ticonderoga variety gives much better results ecause of its natural lubricating qualities, and the fact that the lakes are capable of an infinite subdivision and are thin and tough.

The object of the graphite is to get right at the real cause of riction by eliminating it rather than forming a temporary cure, hat is, if one were to examine a metal surface (no metter how arefully polished) it would be seen to be filled with elevations and epressions, presenting the appearance of a nutmeg grater. Graphte fills in the iow spots and builds over all a thin, tough, veneerike coating of marveious smoothness and endurance.

It has also been found that friction is lower when graphite and il are used together, rather than when the graphite alone is used, s the oil serves as the carrying vehicle and helps to hold the lakes of graphite in place.

The objection cited that the graphite is likely to clog up the oil umps and leads is a good one, and would prevent it being used f there were no other way. Where splash lubrication is employed he graphite may be put into the crankcase in the proportions of scant teaspoonfui to a pint of oil, and where there are no side lates the graphite may be mixed with the oil and poured down the ent pipe.

Some introduce the graphite by removing one of the spark plugs nd squirting it tbrough the aperature by means of an ordinary ısect gun, which can be purchased at any drug store, or by means ' a quiii filled with graphite and rubber tube attached and the ntents blown into tbe cyiinder. Where graphite is used as indi:ted smoother running, higher compression and better regulation iii be quickly noticed; then, too, tbere is the assurance that if the l supply sbouid temporariiy fail there will be no bound pistons or ored cyiinders.

We prepare a speciai graphite for this use, known as Dixon's otor graphite, which is our celebrated Ticonderoga flake graphite, ound to an exceedingly fine powder but still retaining all the vantages of the flake formation.

JOSEPH DIXON CRUCIBLE COMPANY,
per L. H. SNYDER.

NE AUTOIST WHO LIKES TO BE COMFORTABLE.

itor THE AUTOMOBILE:

1,636.]—In the issue of The Automobile of October 22, the title of letter No. 1,592, "Do Autoists Like to Be Comfortable," attracted my attention. I, for one autoist, do like to be comfortable, and for that very reason I hed a simple device mads for my Packard that certainly improves my pleasure in it. I am enclosing you a few photographs of the device, and you are at liberty to publish them if you think they may be of use to any of your readers. The arrangement would, I believe, add to the pleasure of winter driving in any car.

Like many autoists who do much winter driving, I have oftsn felt the necessity of an improvement on the common bunglesome lap robe or "sack"—especially when driving in traffic and when handling the accelerator. A rubber or leather hood buttoned to the dash at the floor board and to the sides of the seats, soives ths robe problem. If the exhaust pipe leads under the floor, an ordinary furnace register-face set in ths board will admit a circulation of air around the pipe and up under the robe. The photos will clearly show the arrangsment of the robe and buttons and the iron grill.

Now, I have no patent to bring before the public, no device to be sold to car owners—I just had the idea carried out for my own comfort—and, being very enthusiastic about the pleasurable necessity, I write you in hopes that it may prove an addition to the pleasure and comfort of autoing in general.

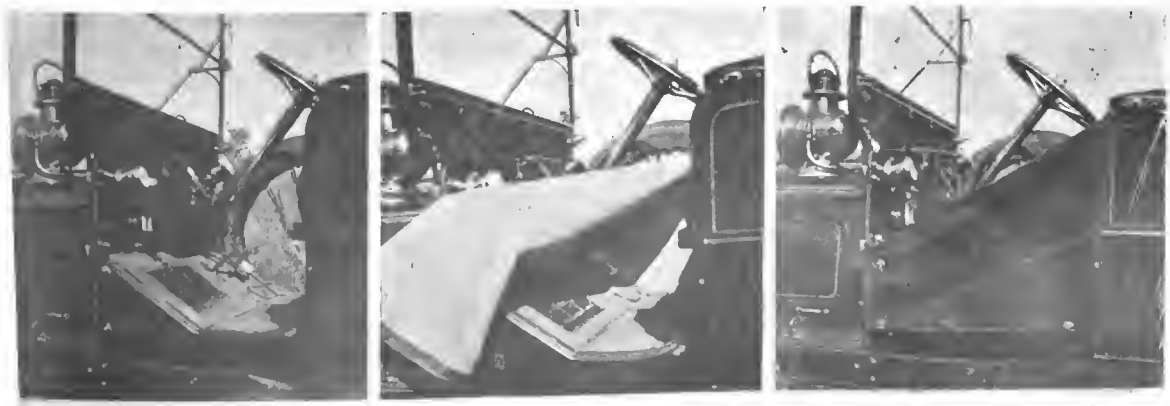
Kansas City, Mo. H. A. FOWLER.

REACHES AND REMOVES DIRT AND GREASE.

Editor THE AUTOMOBILE:

[1,637.]—I note letters of F. C. Snedecker (No. 1,587) and G. Ellsworth Meech (No. 1,610) on gasoline spray for cisaning tbe grease and dirt from auto machinery. I remember, as Mr. Meech does, that at one time someone advertised an air tank fitted with pump gauge, nozzle, etc., for cleaning by this method, but did not take much stock in it. But since Mr. Snedecker mentioned the subject, it set me to thinking I had around my premises a tank that was fitted up for brazing purposes that I could not make much of a success of in brazing. I removed the burners and put in place a length of rubber hose with fine nozzle, hois iess than No. 60 Stub gauge. It is certainly the best and quickest method of doing that kind of cleaning that I have tried. I think as Mr. Meech does, that with the addition of a little kerosene it would improvs matters. With this liquid, driven under pressure as it is, it will reach and remove dirt and grease in corners that is impossible to get at and other way. W. W. TRACEY.

Pittsfield, Mass.



Showing Rsgister Fitted in Floor. Leather Hood Partly Removed. Showing Hood Buttoned Down.

Philadelphia's Fire Chief and His Pierce-Arrow.

Ths chassis is a regular 4-cylndsr 24-horsepowsr Piercs-Arrow, built by the Georgs N. Pierce Company, of Buffalo, and a special body, consisting of two runabout seats and a box compartment in the rear containing hose and regular suppliss usually carried on chemical trucks, was constructed by ths Foss-Hughes Company.

MONTREAL MAY HAVE AUTO SPEEDWAY.

MONTREAL, QUE., Nov. 9.—Tbe Montreal City Council is to be asked to make provision for the construction of a speedway for automobiles on the property belonging to the corporation. The project is advocated by an alderman who, in speaking of the proposed innovation, said that his plan was to ask that the vacant land on both sides of the aqueduct be turned into two fine macadam roads. Tbe length of the aqueduct is something over five miles, extending from Point St. Charles to the lower Lachine road, above the Rapids. In order that the city could build the new conduit to Lachine, and also widen the old aqueduct from 40 to 140 feet, the corporation purchased more land on both sides of the aqueduct. After this is widened and the conduit is completed, there will still be 75 feet of vacant land on each side of the waterways. It is this vacant land that the alderman desires to see remodeled into two roadways.

The alderman admitted that in some forty years or so the city might need tbe land for an increased water supply, but in that event the automobile roads could be given up. The plea was put forth that there would be less fast driving in the streets of the city, if such a speedway is constructed. As the cost of macadamizing the two roads, no figures have as yet been made.

When the concrete covered conduit is completed parallel with the aqueduct it is proposed that before the water supply is turned on, there shall be an electric automobile trip through the subterranean passage, a distance of four miles.

PLAN SECOND-HAND EXCHANGE FOR TRADE.

At a meeting of the New York Automobile Trade Association, held last week, a plan was broached for the establishment by dealers of a "second-hand excbange." It was argued in support of the project that the handling of used cars received in exchange had become a great trouble and expense, necessitating, in the case of the large concerns, separate departments that required additional salesmen and took up much valuable floor and storage space. Attention was also called to the sacrifice attendant on disposing of cars to second-hand dealers and to the bigher prices the public was compelled to pay wben buying sucb cars.

It was suggested the dealers combine and form a stock company, rent a building in a more economical location than the Broadway district, and send their cars to the exchange to be sold at a fixed price, from which the exchange should deduct an established per cent commission. It has been further suggested that a monthly fee be charged for placing the car in the exchange to insure against loss from unsold or long unpurcbased cars. In this connection it was pointed out that as the excbange corporation benefited equally on all cars sold, there would be no object for any favoritism to any one make over another.

It is believed that the public by such a plan would be able to buy cars at a cheaper figure, be assured of a fixed price, and indisputably have a far larger range of selection.

PACKARD WINS A BIG CANADIAN TRACK RACE.

WINNIPEG, Manitoba, Nov. 3.—After being postponed three times on account of unfavorable weather conditions, the Winnipeg Automobile Club's annual race meet was held Saturday, October 24, and attracted a large gathering of people to the new one-mile track at Kirkfield Park. The cluh races were the first racing events to be held on this track, which has only recently been completed and is one of the fastest and best constructed tracks in Canada.

The chief event of the meeting was the 75-mile race for the Dunlop trophy, a handsome silver shield presented to the club by the Dunlop Tire Company for annual competition in either a road or track event. Seven contestants faced the starter out of the original nine entries made. E. Nicholson's Packard led throughout the race, being cleverly handled by his young chauffeur, O. W. Brown. McQuarrie on the McLaughlin Buick suffered from tire trouble in the thirty-second mile and lost six miles on the leader while making repairs. He, however, secured second place after a great struggle with Guest, who was driving John Galt's McLaughlin, the latter being third. When the third car crossed the line, P. C. Andrews, Stevens-Duryea, which was in fourth place, had completed 71 miles.

The Knox Cars that Form the Flying Squadron of the Springfield, Mass., Fire Department.

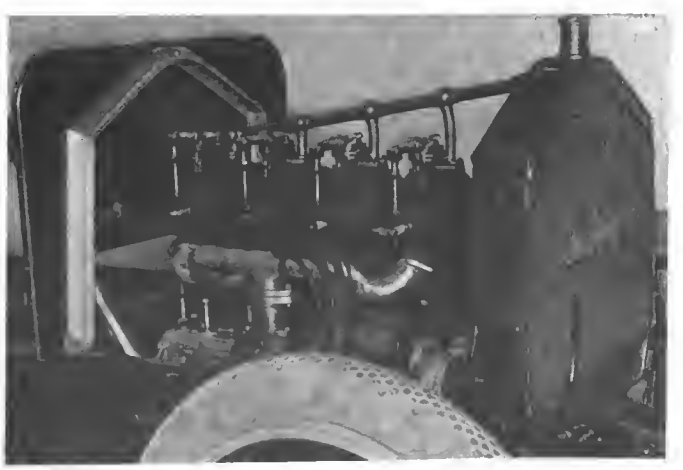
Great Western Cars for 1909

Model 20, 4-Cylinder 30-Horsepower Great Western Touring Car.

REE lines of the Great Western cars are being manufactured by the Model Automobile Company, of Peru, for the season of 1909. These models are styled Models 20, id 22. Model 20 is rated at 30 horsepower; Model 21 at rsepower, and Model 22 at 50 horsepower. Each model is act reproduction of the 50-horsepower seven-passenger car company has been building for the last three years, the ence being size and power.

e mechanical construction is identical in all, hence a deion in common will serve, outside of bore and stroke. Half c springs are used on the seven-passenger car and full c on rear and half in front on Model 20 and Model 21. models are made in either touring car or runabout at the price.

angement, Weight, Power and Dimensions.—The seven-ger 50-horsepower car's weight per horsepower is 58 2-5 s; the 40-horsepower weights 62½ pounds and the 30-ower weighs 62½ pounds in touring car and 63 1-3 pounds about per horsepower. The cylinder dimensions are: 20, 4 x 5-inch stroke and bore, respectively; Model 21, h bore, 5½-inch stroke; Model 22, 5-inch bore, 5½-inch Cylinders are cast separate. Any cylinder can be re- without disturbing any of the others. The pistons are d inside and out en annealed before e ground, thus giv- m equality of ex- exhaust valves are in the head and pletely surrounded ter. The intake re at the side, and to the cylinder as for the purpose of practically the en- rance in the cyl- The exhaust has stem, the top of cupped to receive ball against which kerarm works. done for the pur- eliminating noise uard against side-



Accessory Side of the New Four-Cylinder Motor.

wearing of the lifts. The intake valves are also equipped with ball ends for the same purpose as the exhaust. Cylinders are offset a half inch from center of crankshaft.

The crankcase is aluminum, in two pieces, with spacious handholes for connecting rod inspection and adjustment, and has five bearings for crankshaft. Right here a step is taken which will prove a factor in motor building. The crankcase proper does not take any of the strain of the power strokes of the piston; instead the studs which hold the cylinders to the crankcase go clear through and hold the manganese bronze bearing-caps of the crankshaft. The bottom half can be quickly removed without interfering with any bearing. Nickel babbitt, "die cast" bearings are used throughout.

The crankshaft is a solid one-piece drop forging, heat treated and ground to size, carefully balanced alone and with flywheel assembled. All valves are operated by a single camshaft. The gears for camshaft, pump and magneto drive are enclosed in a separate oil-tight case, which is divided in such a way that either the pump or magneto can be removed independently of each other or the balance of the gears.

A gear pump is used in conjunction with a flat tube radiator of ample size to insure proper cooling. The fan is mounted upon an adjustable bracket and is driven by 1-inch belt three and one-half times the engine speed.

Oiling, Ignition and Carburetion.—Ignition is by high tension magneto and battery, each system independent of the other. The magneto is located on the right forward supporting arm of the crankcase, just ahead of the carbureter. A Schebler "type P" automatic water-jacketed carbureter is used, located in center of the motor, on the right-hand side just below the inlet valve chambers. The oiler, with seven sight feeds, is mounted close to exhaust pipe, to keep oil flowing freely in cold

weather, and is driven by an eccentric and ratchet. The splash system is used in the crankcase.

The Transmission System.—A cone clutch is used with "raybestos" covering, with springs under covering to insure easy engagement. One of the features of the clutch is its manner of releasing, which is through a ball thrust bearing instead of a sliding yoke. The ball thrust is of split type, making it easy to remove. The thrust plates are hardened and ground. This type of clutch is simple, easily understood and quickly adjusted for wear. The connection between clutch and transmission is a double universal joint with sliding square for clutch release.

Clutch End of the Motor.

The gearset is of the selective type sliding gear, three speeds forward and reverse. Countershaft gears are keyed and forced on by hydraulic pressure, spaced by tubing separators. The reverse gear is forged integral with shaft, the gear on the opposite end being riveted in place. The drive shaft is round with four keys integral with the shaft. The spaces between are milled, hardened and lapped to size. The bearings are absolutely interchangeable. Bevel gear and differential casing have thread and nut adjustment for setting mesh of gear and pinion. Drive shaft with load is perfectly straight.

Rear axle is a heavy steel tubing, riveted and brazed, making it secure. Brake hangers of steel castings with dust flangers are used. Brakes are large and powerful internal expanding and external band on wheel hub drum; external bands lined with camel-hair fabric. These brakes hold both ways; operated by hand lever; external brakes are operated by foot lever 1⅜-inch nickel steel. Floating axle transmits power to hub clutch plates in rear wheel.

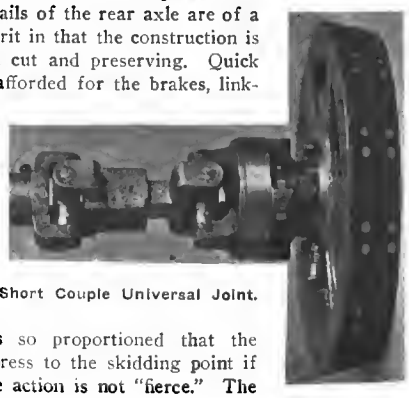
Front axle is I-beam type of solid one-piece forging. The center of front axle is the lowest point of the car. The pivot point of the steering knuckle is supported on hardened thrust bearings. Steering gear is of the worm and gear type, with eccentric bushings to adjust to worm and gear. All rods, levers and equalizers are underneath the cars between springs, leaving outside clean.

Specifications in the Main.—Frames cold pressed nickel steel, channel section with subframe and cross-sections.

In all cases the tread is 56 inches. The Model 20 car had 106-inch wheelbase; Model 21, 114 inches, and Model 22, 122 inches. The ground clearance is 10 inches, or better, in all cases, and the wheels are artillery type on ball bearings. Special attention has been given to the spring suspensions, with the idea of adopting the car to rough country roads. The easy riding qualities are further assured by the use of liberal sizes of tires.

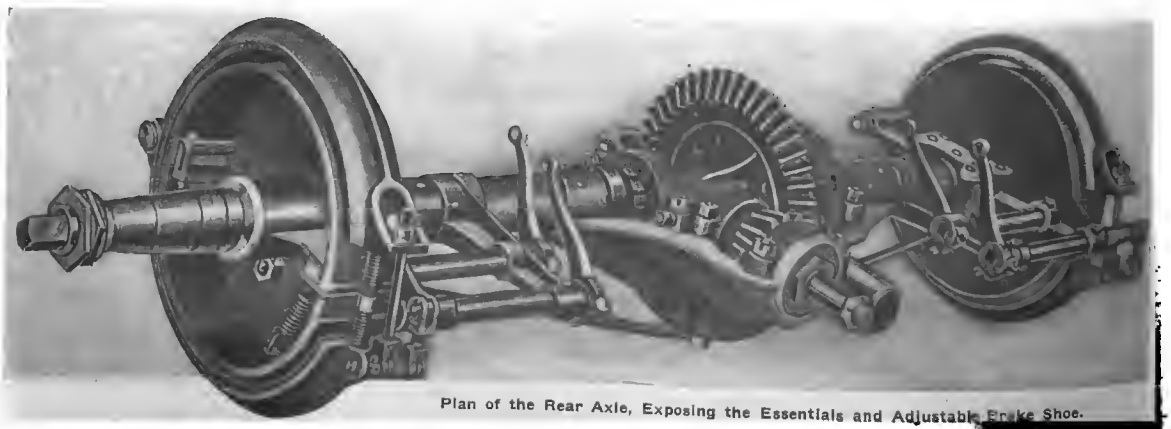
Some Protective Measures Shown.—Metal is used enclosing underpart of car; one side is hinged, while the other is clamped to the frame; thus the pan can be dropped very quickly, giving access to the underpart of car. Both front and rear fenders are designed for attractiveness and to insure greatest protection to car and its occupants. Much attention has been given to making the position of the driver comfortable, hence the space between the front and rear seat and dash is long and permits the driver to straighten out, and not be in a cramped position.

Some Notable General Features.—The details involving the clutch and the universal joints take on the appearance of a display of ingenuity in design, and there is a certain sturdiness in the construction that cannot be passed unnoticed. The details of the rear axle are of a high order of merit in that the construction is mechanical, clean cut and preserving. Quick adjustments are afforded for the brakes, linkage arms are provided with outboard bearings, and the brake shoes have liberal areas and are sufficiently rigid to assure uniform contact. The "motion" is so proportioned that the brakeshoes will press to the skidding point if necessary, but the action is not "fierce." The details in connection with the differential housing are very substantial indeed, bearing adequately supported, and the bevel drive is so arranged as to enable the workman to relate the gear and pinion in a manner to abort noise. The half time gears are separately and cleverly housed in, they are thus protected from foreign substances, and they may run in a grease pack for the double purpose of preventing noise on the one hand and engendering a long life on the other. The accessories under the bonnet may be quickly removed, are getatable in place, nor is it the least of the advantages, that ample provision has been made for oiling at every point.



Short Couple Universal Joint.

The leather face cone clutch is very carefully designed with a view to eliminating "spinning" effects. The coefficient of friction is held at a high point through the addition of cork inserts.



Plan of the Rear Axle, Exposing the Essentials and Adjustable Brake Shoe.

FRANCE PLANS TO HAVE AEROPLANE RACE

PARIS, Nov. 4.—There will be a flying race, the first the world has ever known, on the vast plains around Chartres, or on the open Champagne country around Rheims some time next fall. A prize of $20,000 will be offered to the pilot of the heavier-than-air flying machine capable of covering the greatest distance in the shortest possible time, under detail conditions yet to be announced. In instituting its aeroplane race the Aero Club of France declares that it is convinced that sky pilots have outgrown the preliminary period of circling round a field, and that in future the art must be practiced across country, from town to town. The definite selection of a course will be made later, but in any case it will be either over the Beauce plains to the west of Paris—the granary of France, or on the Champagne plains to the East—world-famed for its wines. No more suitable spot could be imagined, for the country is as flat as the proverbial billiard table, there are few villages, and practically no natural obstructions. Detail regulations regarding the race are being anxiously awaited by intending competitors.

Among French sky pilots the announcement of the aeroplane race is received with immense satisfaction, and already one dozen men are counted on as certain starters. Either Wilbur or Orville Wright, or both, will, it is believed, take part in the race, which will be open to all without restriction of nationality; Farman, Delagrange, Bleriot, Esnault-Pelterie, Kapferer, Gastambide-Mengin and Ferber are all looked upon as certain competitors.

A wave of aeronautical enthusiasm is sweeping over France, the desire to secure first place in aeral navigation being confined not merely to a group of enthusiasts, but being spread throughout the entire nation. Automobile constructors are keenly interested in the future of the aeroplane, as is shown by the fact that not only their engineers closely studying the aerial motor question, but the heads of the leading automobile firms are frequent spectators at the flights of Wright, Farman and others.

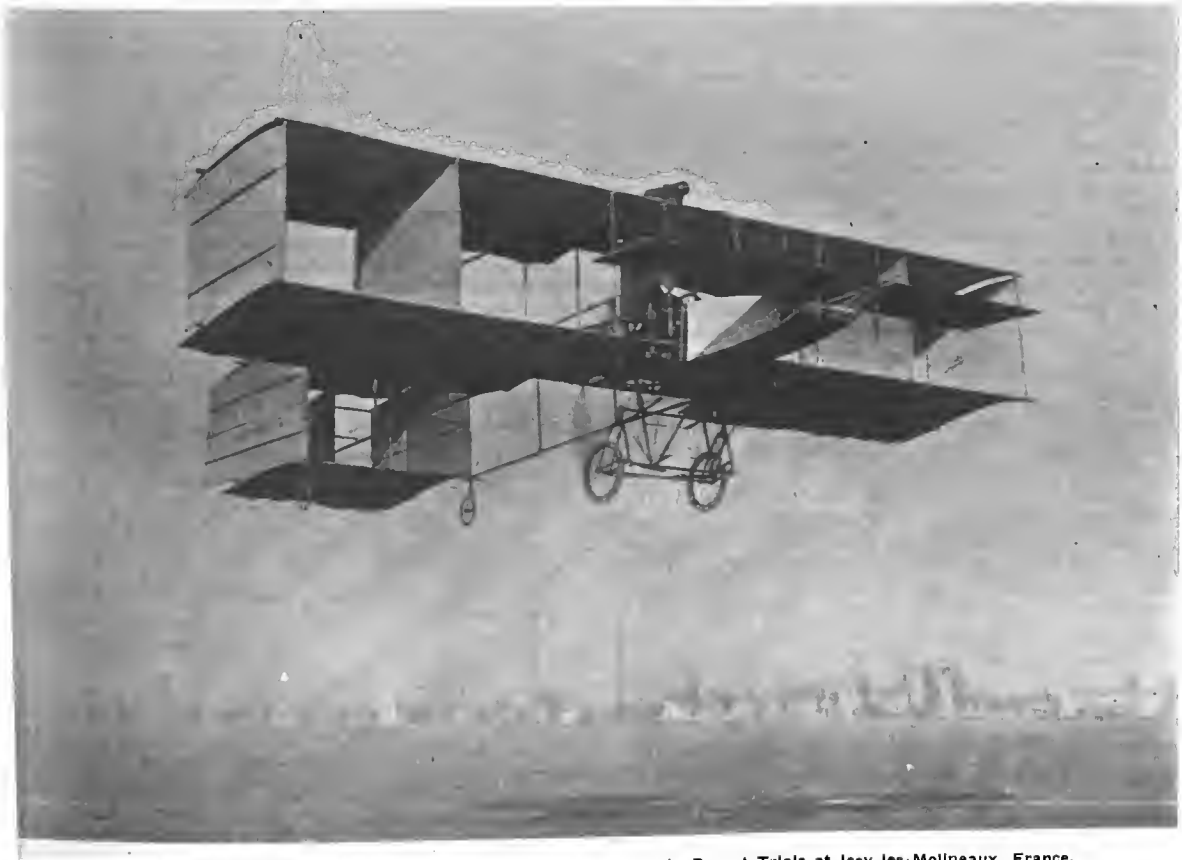
In addition to the Aero Club of France, the International Association of Recognized Automobile Clubs is occupying itself with aeroplane races. At the last meeting of this organization, held in Paris, it was unanimously decided to organize a flying machine race during the summer of 1910.

FRENCHMEN DO HONOR TO WILBUR WRIGHT.

PARIS, Nov. 5.—After being the subject of endless criticism and so little believed in that his name became synonymous with bluff, Wilbur Wright is the hero of the hour. He was the guest of honor this evening at the dinner of the Aero Club of France, at which M. Jean Barthou, the Minister of Public Works, presided, and who presented to Mr. Wright the Aero Club's gold medal and the special medal of the Acadamy of Sports. The 200 guests present included practically all the European experts and scientists interested in aviation.

FARMAN'S CROSS-COUNTRY AERO FLIGHT.

PARIS, Nov. 1.—Henry Farman has made the first cross-country aeroplane flight by a journey of about 17 miles from Chalons to Rheims. In order to clear obstructions he was obliged to rise to about 250 feet, and he accomplished the feat in 20 minutes, at an average speed of 45 miles per hour.



The Aeroplane of Leon Delagrange in Graceful Flight at One of the Recent Trials at Issy-les-Molineaux, France.

Comfort in Costume for the Woman in Autoing

AS so much of that satisfaction in the consciousness of being well-dressed which a sense of piety does not invariably bestow, is to be derived from automobiling attire, women who are ambitious to be quoted as among the modishly garbed, are devoting an immense amount of time—not to mention money—to their motoring toggery for the coming winter. Naturally the all-enveloping coat is of chief importance. This season there are innumerable models in middle weight worsteds, suited to a mild climate, as well as thick fabrics, almost as cold resisting as are the Swedish leathers and various pelts adapted to those northern regions in which winter arrives early and lingers late. Among the worsted coats are several new designs embracing the salient features of the Directoire period. These are the wide pointed revers which fasten over the fronts of the coat by means of cabachon buttons run through elongated button holes, and the high, turn-over collar which also is button trimmed. Many of these new models are of pelisse and redingote shape, but with sides slashed to the hips so that despite a scantiness of material below the waist line, there is no strain upon the lower portion of the garment when its wearer is seated. On these coats are placed the broad turn back Louis cuffs and the wide flaps covering the top of really serviceable deep pockets of leather which are let in just below the hips. The raised waist line which distinguishes so many ordinary coats and gowns appears in some of these redingotes in which the short effect is emphasized by means of a wide strap of material matching the revers and collar, that extends from the centre of the back to halfway across the front where it terminates with a huge button. In black, brown, green, taupe, smoke, wistaria, catawba, blue, wine, gray and tan broadcloth, these semi-fitting long wraps make ideal medium weight garments for motoring and are sufficiently dressy for general street use.

Double box plaits form the backs of an exceedingly smart model coat of Scotch cheviot which has a double breasted front and biased side forms. This cutting scheme places most of the fulness in the back and gives the long, flowing lines of the Empire without making the garment cumbersome—a fault which automobile tailors were just a bit slow to rectify.

Two-faced cloths are much in vogue at the moment for long coats of the ulster order, finished with mannish collars and revers showing the gayly plaided inner side of the material. The feature of such coats, however, is a double set of pockets, two of goodly dimensions upon the breast and a duplicate set of nearly twice their size over the hips. They are so set upon the garment that a plaid piped strap of the cloth, extending over the shoulders, borders the outer edges of both breast and hip pockets.

Chinchilla cloth, Irish frieze and various novelty weaves of rough surface and being extensively employed for the heavy coats designed to take the place of the fur and fur-lined garments to which some women object on the ground that it is impossible to exchange them for a wrap of pelt until the backbone of the winter has been broken and all furs are permanently discarded. Necessarily these very thick materials must be made up as scantily as is possible else they will prove too bulky for use save when the wearer of them is riding. The best model of all those recently brought from Paris is one having a back with a straight centre seam and sides which widen gradually from beneath the arms' eyes where they join fronts cut in precisely the same manner. This gives sufficient flare about the knees and feet, but not an inch of unnecessary weight. So narrow are the front and back forms across the shoulders that when the medium sized conventional coat sleeves are set plainly into the wide arms' eyes, their tops are almost concealed beneath a collar of moderate width.

Buttons are not a prominent feature of any of these rough fabric coats, for although quantities of them are employed, they are strictly utilitarian and fasten the slashed sides and back as well as close the fronts. Usually they are of moderate dimensions and of bone or metal precisely the shade of the cloth. On the contrary, the collars and sometimes the cuffs are surprisingly ornate. Sometimes they are of brilliantly hued leather or French kid and often they are of Oriental embroidery done on satin or of velvet with tinsel soutache braiding.

In addition to the rubberized English mohair, taffeta, satin or crêpe de Chine storm coat which accompanies every wise woman upon a motoring trip, there are various novel accessories designed

: shoulders, throat or head. One of these is the *ho* of oil silk or rubberized light weight fabric and ılar of about umbrella dimensions with a hole cut through which the head may be thrust. Another storm hood of materials similar to those employed *o* and large enough to be quickly drawn over the of ordinary size. Its features, however, is the im- ke those seen on old fashioned bonnets which falls collar and perfectly protects the throat.

fers of either wool or silk are of great convenience bilist whose coat is not double-breasted, as they wide and long that they entirely cover the chest he lack of sleeves add quite as much warmth as ne waist length sweater. Happily the worsted coat late months to a really serviceable size, the newest rs extending quite to the knees and being shaped tight street coats of the conventional tailored type. gh band collars covering the throat and their deep ctending half way over the hands, they promise so that fur coats seem unnecessarily burdensome. er has been a time when fur was so much to the obile circles. In addition to the aristocratic look- uskrat which so closely resembles seal as to deceive all but the initiated. The natural and sabled squirrel, the natural and dyed Russian pony and caracul, there are fetching looking garments in civit cat, leopard, coon and dog skin. While a majority of these coats are fifty inches long very smart affairs are of knee length, as some women prefer the three-quarters style in pelt as well as in the smooth and rough cloths that are fur-lined.

Gray, sabled and marked squirrel remain the favorite pelts for coat, hood and rug linings. Some of these intended for wraps come in such shape that they may readily be adapted to garments of any design so that, like the shawl collars of chinchilla, mink and linx, they may be shifted from a motoring to an evening wrap. The wee woman who likes to motor wears a sabled squirrel or white fox coat covering her skirt hem unless, like some of her elders, she has one of Swedish leather or French kid modelled after those of chinchilla cloth but lined brilliantly with kid-pale blue under white, red with French green and brown with cardinal.

Hats made of soft French felt, of Ottoman or of satin usually have the wind resisting depressed brim and the medium high crown, while those of leather kid or fur are on the turban or collapsible order, but hoods are rapidly coming to the fore as there is no danger of their blowing off and it is far easier to becomingly drape veils about them.

'S FOR WOMEN WHO CONTEMPLATE TOURING ABROAD

By BLANCHE McMANUS.

ratively recent vogue for the three-seated auto has tself and quite exploded the old adage that "three's y one of the 18-horsepower, or even 12-horsepower; rful for the kind of roads one ought to tour on— o bad for that in the region where you propose powerful machine won't make them any better, and go by train in the good old-fashioned and more

ed great cost of automobile touring is another ght to be exploded. Automobile touring, under l conditions is cheaper than any other form of one counts everything. A party of four women ndy and Brittany in a hired automobile for ten thing like $40 each, and another party of five n the Riviera, starting from Marseilles, for $100 party. How about that!

to the low-powered automobile, the writer once Alps in a *voiture légére,* built for two, with a only six—but they were full-grown French horse- Echelles, in Savoie; the Galiber; Lautret; Mont Simplon had no terrors. The three-seated auto- course, accommodate a chauffeur in the spider- you had much better fill it with a friend. He, e "the time of their lives" from such a viewpoint, who knows 12-horsepower is enough for the s in France, Italy and Germany, and in Algeria , if you think you would like something out of d the writer has done that, too, and found no Africa that a modest man's, or woman's auto- t scale.

three-seated automobile enables one to do away iced chauffeur, who drives your machine at the t suits himself, and to places whose hotels he m others of his kind, and who in general has a e byroads and the hotels of the country town.

obile touring abroad is largely confined to the untries, not ignoring Algeria and Tunisia, where the best where they exist at all. Most people that the countries bordering upon the great ke are blessed continually with a Summer cli- not. There is plenty of sunshine, but there nd there are cold seasons, which are not the e idea of orange blossoms and olive groves. The cold wind which comes up at sunset is nowhere more to be feared than on the French and Italian Rivieras, and the daily drop in temperature at this hour is something inconceivable to those who know it not. So when you take your long-dreamt-of automobile tour over the olive-covered slopes of the French Riviera, or along the vine bordered roads of sunny Italy, just remember that you will need the same warm clothing which is necessary while touring in many other countries.

One can do without furs, however; indeed, you should always leave that sealskin coat at home while traveling abroad, and then you won't be harassed getting it back through the customs again. Furs are not really needed, except in the Scandinavian peninsula and Russia, and those places have not yet been developed as automobile touring grounds. Furs, on an automobile, are only catch-alls for dirt and perhaps other things not so harmless. The woman automobilist will find good warm cloth garments to more than take their place.

The woman automobilist not infrequently prefers the English inn to the Continental hotel, principally because she finds carpeted microbe breeding and harboring floors there, a plethora of furniture and dimity curtains at the windows, good-sized wash-basins, and personal service from a bevy of neat capped maids who understand how to envelop the traveler with that air of importance and distinction, especially dear to a certain class of traveling Americans, who often never had so important a personage about them at home as a nigger cook.

While on the continent femininity of the same class professes to be appalled by the rather gaunt and bare—though undeniably cleanly—furnished rooms of the average country hotel. There bare floors of waxed tiles or wood seem chilly and uncomfortable, and the personnel who receives the traveler is apt to be less effusive over one's coming than in England; their's is a politeness tempered with a friendly independence, which one can but admire; they do not crawl or fawn about one, and you do not pay for inefficiency in the bill on leaving, either.

The advantages of the English inn are mostly superficial, however, and one soon learns to prefer bedrooms which seem rather to have gone through a process of elimination than an addition of useless lumbering accessories. The more efficient, though more independent continental *garçon* is worth half a dozen simpering mob-capped maidens when it comes to getting you installed in your rooms on arrival and getting your luggage down and strapped on the automobile on leaving.

CLUBS AID IN SUPPRESSION OF RECKLESS DRIVING

NEW YORK, Nov. 8.—Reports received at the headquarters of the American Automobile Association indicate that officers of many of the local automobile clubs which have placed their organizations on record as strongly opposed to speeding and reckless driving are not content with this action alone, but intend to place the responsibility where it rightfully belongs, upon the autoists of other States, who in many cases do not evidence any desire or inclination to observe the local speed laws. Many of the automobile clubs affiliated with the A. A. A. have during the past several months endeavored to break up the reckless driving and speeding through the principal thoroughfares, and the Automobile Club of Springfield (Mass.) has taken drastic action which will without doubt have a far-reaching effect.

At a recent meeting of the directors of the club, which is one of tbe largest and most influential in New England, it was decided to have suitable cards printed wbich will be displayed in all of the hotels and garages in Springfield and vicinity and leading through the popular routes into the adjoining States. These cards will call upon the automobilists to use the roads in a safe and sane manner, and if they fail to comply with the club's request, the directors have decided that there is but one alternative, that, the establishment of official club speed traps. The Springfield club is determined that the speed laws in the vicinity shall be properly observed, the club feeling morally responsible for the acts of the autoists from other States and they will not hesitate to establish traps if it is deemed necessary.

The club has taken this step upon their own inititative without waiting for specific complaints to be made, and in this connection have taken more radical action than the other clubs in New England which have been considering the best means of discouraging the continuous speeding over the splendid highways of that section.

It is only a few weeks ago that Secretary Elliott of the A. A. A. sent a warning against reckless driving to the officers of the 200 automobile clubs scattered throughout the United States, to the effect that drastic anti-automobile legislation would surely be enacted in many of the Eastern States, particularly Connecticut, if a stop was not put to the reckless driving over the roads of New England. There has already been some agitation regarding the Connecticut automobile statute, regarded as one of the modern motor vehicle laws in the country, being likely to be repealed, unless the autoists touring through the State cease speeding and thereby tend to diminish the number of accidents which have frequently occurred to the other users of the highways.

STATE ROAD TO DELAWARE WATER GAP.

SCRANTON, PA., Nov. 9.—At the annual election and banquet of the Scranton Automobile Association the papers read by the officers who had served in different capacities during the past year brought clearly before the minds of all the seventy odd members present the commendable work that has already been accomplished, or on the way of accomplishment, by the association. The retiring president, Dr. H. B. Ware, read a report on the growth of the association and the object which caused it to be organized, mentioning in detail some of the more important of these which have been attained: the changed attitude of the police and city authorities towards the reasonable use of the automobile, the work of educating the county overseers up to the point where they will be equally as desirous for good roads as the automobilist, and the proposed meeting between club members and the overseers to further this purpose.

The report of the chairman of the good roads committee, E. M. Clarke, was especially interesting as it dealt largely with the progress made in the proposed state road from Scranton over the Poconos to the Delaware Water Gap. He stated that if the association would bind itself to stand half of the expense falling upon the township through which the road passed, it would be an assured fact. This means about $6,000, which he said could be easily raised as he had already received pledges for liberal contributions.

The officers for the following year are: President, Thomas Sprague; vice-president, William H. Richmond; secretary-treasurer, Hugb B. Andrews. Dr. H. B. Ware, George Jermyn, and John Creining were elected to the board of governors to serve for three years.

ROCHESTER CLUB WANTS 1,000 MEMBERSHIP.

ROCHESTER, N. Y., Nov. 9.—The Rochester Automobile Club under its present administration is rapidly growing in membership, the total now being 531. The aim of President Henry G. Strong and Secretary Van Tuyle is 1,000 before the next annual meeting. Seventeen members were added at the recent meeting. The secretary's office is at the Hotel Seneca.

Recently there has been some reckless driving in and about Rochester, and as a result of a recent incident the club has sent broadcast the circular herewith reproduced. The club deems it advisable to apprehend, if possible, infringers of the speed law and the rights of pedestrians. The case in question was one of flagrant disregard of the latter, and its perpetrator should be made an example of.

$100 REWARD

Will be Paid by the

Rochester Automobile Club

for information leading to the arrest of the person driving the automobile which ran over JOSEPH HARTMAN on East Avenue, at six o'clock, Wednesday Evening, October 28, 1908.

Rochester Automobile Club

BERT VAN TUYLE, Secretary

Facsimile of Notice Issued by Rochester Automobile Club.

CLUB ACTIVITIES IN AND ABOUT PHILADELPHIA.

PHILADELPHIA, Nov. 9.—Club activity in the Quarker City is on the increase. That solid old organization, the Automobile Club of Philadelphia, having just gotten its one annual competitive stunt—the Brazier Cup contest—off its hands, is now busily engaged considering ways and means of building a centrally located and handsomely equipped clubhouse and garage to accommodate its rapidly growing membership. Tbe committee having the matter in charge has met with such success in seeking subscriptions to the proposed bond issue to float the scheme, that it has been decided to enlarge its original plans and endeavor to secure at once the entire sum that must be guaranteed before any conclusion of the matter is possible. It is authoritatively stated that the opening of next Spring will see the bopes of the

committee well on the way toward fulfillment. The club is still adding substantially to its rolls at every meeting, no less than 26 being admitted at last Monday's gathering of the Board of Governors. The committee on routes, maps and signs—which, by the way, is doing such excellent work that it is being set up as a model by clubs in others sections of the country—is almost ready with a complete revision of its road map of Philadelphia and vicinity, which will be issued from the press shortly, together with an additional book of routes. Each month this committee erects, or causes to be erected, at least a score or two of mileage, direction, and warning signs, and its work is in evidence no matter what direction the automobile traveler may take in coming into or leaving the city. This feature of the club's activities has been most potent in attracting those automobilists who realize the value of such work, and has been responsible for the addition of a large proportion of the new membership.

Up in Germantown the same old story of outgrowing the facilities afforded by the twice-enlarged clubhouse are heard, and now, in order to find room for a portion of those who are growing restive at being compelled to decorate the long waiting list for such a length of time, the officials of the club have decided to enlarge its quarters, and work will be begun on a handsome addition in the near future.

Tbe Quaker City Motor Club, having recovered from tbe jubilation following its successful management of the 200-mile Founders' Week race in Fairmount Park, is taking tbe first steps toward opening the 1909 season. To-morrow a bunch of "pathfinders" will leave town to select hard routes to and from Wilkes-Barre, which has been decided upon as the outward mark from its annual two-day New Year's run, January 1-2 next. The remembrances of the too-numerous ties and tbe subsequent runovers are still fresh in the minds of the contest committeemen, and the "pathfinders" have been ordered to select routes sufficiently difficult to keep the number of clean-score cars within a reasonable limit. MacDonald & Campbell, donors of the first prize cup, have announced that this year they will allow that emblem to go for "keeps" to the winning car, despite the fact that the original deed of gift called for a three-time win in order to secure permanent possession of the cnp.

The Quakers have chartered the steamship *Grecian*, sailing November 22, for the round trip to the Savannah races.

Across the Delaware, the erstwhile Camden Automobile Association has been reorganized as the Camden Motor Club, and is preparing to take active part in bringing about a much needed improvement in Camden county's roads. Dr. H. H. Grace is president of the reorganized club, with W. L. Hurley vice-president, and George E. Rhedemeyer, Merchantville, N. J., secretary and treasurer.

WILKES-BARRE CLUB HAS WON ITS FIGHT.

WILKES-BARRE, PA., Nov. 9.—The Wilkes-Barre Automobile Club bas succeeded in its fight to have the bridges across the Susquehanna from Wilkes-Barre to the west side and one from Pittston to West Pittston, declared free bridges. The members of the club circulated a number of petitions which were presented to the grand jury along with evidence resulting in the recommendation tbat these bridges be purchased by the county and thrown open to all without cost. This will not only save the members of the club a great deal of annoyance, but also all drivers of automobiles who travel through that section of Pennsylvania.

The sign post committee of the club is now busily engaged in carrying out its work of erecting direction and danger signs on all the main traveled roads in this vicinity with the hope that this beginning will be completed within the next few weeks.

On Saturday of last week the good roads advocates of the Wilkes-Barre Automobile Club secured the indictment of Mayor Lewis P. Kniffen and thirty members of the common council, for maintaining a nuisance in failing to have the streets of the city properly repaired. District Attorney Abram Salsburg laid the case before the grand jury and will call the accused for trial.

SCRANTON CLUB TO RAISE ROAD MONEY.

SCRANTON, PA., Nov. 9.—The plans for the State road over the Pocono Mountain towards Stroudsburg are taking such a definite form that there seems to be no doubt about the road's final completion. The supervisors of the different townships, and officers of the Scranton Automobile Association have at last gotten together and work will be started this week by members of the club to raise the $6,000 which they have promised as a body towards the construction of this new highway. Now that the farmers in the townships know exactly what the Automobile Association will do in the way of raising money, the petitions will be filed with State Higbway Department immediately. The work of collecting the club contributions will be in the hands of E. M. Clarke, of the firm of Clarke Brothers, and Solicitor H. B. Andrews, of the Automobile Association.

VIRGINIANS ELECT NEW OFFICERS FOR 1909.

NORFOLK, VA., Nov. 9.—At a recent meeting of the Tidewater Automobile Association of tbis city the association elected officers for the coming year and afterwards adjourned to the Lorraine hotel where a banquet was served in honor of the third successful year of the organization. The slogan of the meeting was not only good roads for the country, but the city as well, where many of the streets have been allowed to exist in a state not even fit for country roads even. The following officers were chosen for the coming year: President, W. M. Whaley; first vice-president, C. H. Bull; second vice-president, J. M. Gibbs; secretary and treasurer, C. L. Young. The directors elected were: F. O. Smith, S. W. Pannill, S. W. Harris and D. P. Paul, who, with the officers, include the board.

ATLANTA AUTOMOBILE CLUB ORGANIZED.

ATLANTA, GA., Nov. 9.—Over sixty automobile owners of Atlanta have organized the Atlanta Automobile Club and elected the following officers: President, Edward H. Inman; vice-president, Charles H. Ryan; secretary-treasurer, W. G. Humphrey. Executive committee: Beaumont Davidson, R. F. Maddox, J. D. Rhodes, Asa Chandler, Jr., Frank S. Ellis, and R. R. Arnold, Jr. More than $6,000 has already been subscribed for the purpose of erecting a club house and President Inman will appoint a committee to have full charge of this work with the hope that suitable quarters for the club will be built at an early date.

KOKOMO INDIANIANS ORGANIZE A CLUB.

KOKOMO, IND., Nov. 9.—Automobile owners of this place and vicinity have organized the Kokomo Automobile Club with an initial membersbip of over 100. Articles of incorporation have been filed and plans are on foot for securing club rooms in a suitable location. At the first meeting all the members were enthusiastic for a campaign in conjunction with the other clubs in the State, for the advancement of the good roads movement.

SAWYER NOW MASSACHUSETTS SECRETARY.

BOSTON, Nov. 9.—At an adjourned meeting of the directors of the Massachusetts State automobile association Herbert M. Sawyer of tbe Worcester Automobile Club was elected secretary to succeed James Fortescue, who refused a renomination to the office. Mr. Sawyer has been prominent in the affairs of the Worcester club, was last year secretary of the Worcester Board of trade and has a reputation as a hustler.

ANOTHER CLUB FOR PENNSYLVANIA.

KITTANNING, PA., Nov. 9.—The automobile owners of Kittanning have at last organized and the membership at present numbers about thirty, with prospects of a constantly increasing roll. J. H. Painter has been elected president and W. Moorhead, secretary and treasurer. The club proposes not only to work in the interests of better roads, but to provide better garage and repair facilities for Kittanning.

THE AUTOMOBILE

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MUST BE REFORM FROM THE INSIDE.

It has become a necessitated case of reform from the inside in many localities where visiting autoists are numerous and negligent in observance of the rights of the other users of the road.

Members of legislative committees of various State bodies of the American Automobile Association each year have found it harder to answer successfully the charge of the lawmakers that an increasing number of autoists, when away from home, act in a manner of which they would not be guilty in their own localities. It is a situation where it looks very much as though the needs required a law-abiding autoist to catch a law-breaking autoist, and this idea is likely to spread quite generally and effectively in the next few months.

One club has met the issue squarely and without equivocation. On one of the most traveled main routes lies Springfield, Mass., and the abuse of the roads in its environs has gone beyond further acquiescence by the local automobile club, which announces that it will aid energetically in the punishment of those "tourists" who leave in their trail a cloud of dust and an assortment of mangled poultry and dogs, with the occasional inevitable catastrophies of greater magnitude. These roughs of the road must be brought to the bar of justice, and unless a plan is evolved whereby it is accomplished, the demand for more stringent laws will be unsuccessfully met by those autoists who labor generously every Winter at State capitals in the effort to obtain reasonable statutes.

If it is an established fact that the autoists themselves are lending efficient aid in apprehending these offenders, it will lessen in vast degree legislative prejudices, which are slowly giving away and would be dissipated more quickly were it not for the unjustifiable use of the highways by the inconsiderate few. These speed-crazed beings have miles of open country, and they should be hammered, if must be, into a sense of decency in places where the rights of others call for recognition.

* * *

ALMOST IMPERCEPTIBLE REFINEMENTS.

The time was when autoists were curious to know why ambitious types of automobiles ran into money. They could not see the equivalent in their cursory examination of the cars. They did admit the good performance, and they were persuaded to pay the price.

The most recent slant of this character lies in the desire for enlightenment along lines involving the 1909 cars. Why are they so much better, when the price is so much lower? It is like everything human; experience teaches economies, processes bow to refinements, and duplications of efforts eliminate themselves in time.

There is a great difference between doing things as a matter of course, and groping around in the dark, hoping thereby to stumble upon the missing link. In every art, science and industry a certain amount of groping must precede a definite measure of success. Fortunately, groping is the task of intelligence, but while the process goes on the cost floats up. Fortunately, ignorance might forego the finish, and the cost would never fall to the tune of soaring quality.

The reasons why the costs can be lower, and the quality become superior, are deep seated and scattered. They lie in the definite aims, the swelling volume of trade, and automatic co-operation on the part of the vendors of materials, the designers of automobiles, and the artisan, who weld the aggregation into the splendid finished products that greet the sober, earnest thinkers, who must support an industry to render it a complete success.

* * *

IN THE CONTROL OF COMPETITIONS.

Automobile competitions of the big sort are expensive. This expense is now borne, except in rare instances, by the manufacturers. It would appear logical that the man who pays the bills should have considerable voice in the premises; in the past, in this country, he has been a necessary yet modest factor. It is a good guess that his attitude will change shortly, and there are indications that the future will tell its own story in this regard.

That the methods of conduct and caliber of entrants will not deteriorate, is assured in advance, and, furthermore, the public will be interested to the same extent when patrons realize that the business element will not be allowed to intrude itself in a detrimental manner. That this can be accomplished, is evident from the results in France, where the makers have much to say as to what they will compete in and how and when.

LAW SAFE IF OFFENDERS ARE PUNISHED.

HARTFORD, CONN., Nov. 8.—Never since its inception has a more enthusiastic meeting of the Automobile Club of Hartford been held than that of Friday noon last. About a hundred of tbe members congregated at the Allyn House, completely filling the clubrooms. Many prominent citizens were present, including United States Senator Morgan G. Bulkeley, Mayor E. W. Hooker, City Engineer F. L. Ford, Colonel George Pope, and J. Gilbert Calhoun. Delegates from the various clubs comprising tbe Connecticut Automobile Association were present as the guests of the Automobile Club of Hartford.

After lunch the gathering listened to a very neat speech by Senator Bulkeley, who stated in connection with violations of the State automobile law that that measure was still good, even if it had been abused. It was the senatôr's opinion that bringing the offenders to book would alleviate present conditions.

Colonel George Pope, a member of the legislative committee which did a lot of hard work in the interest of the present liberal law, was the next speaker. Colonel Pope expressed the view that there was nothing to fear in the fortbcoming legislative body as regards a possible abrogation of the present law. "What we really need is not to repeal the law, but to enforce it."

Walter S. Schutz, attorney for the Automobile Club, spoke particularly of the money realized from licenses which should be expended for road repairs. Mr. Schutz struck a keynote when he remarked that one thing badly needed was a bridge across the Connecticut River at Lyme and Saybrook.

At the conclusion of the lunch a mammoth bunch of flowers was sent to Louis Elmer, the local Ford agent, who is seriously ill at the Hartford Hospital.

Following the lunch there was a business meeting of tbe Connecticut Automobile Association. J. D. Anderson was unanimously elected a director to the State body, vice G. K. Dustin, resigned. C. H. Gillette was elected secretary of the State association to fill the unexpired term of G. K. Dustin, resigned, and J. M. Brooks, of the Litchfield club, was elected treasurer.

The matter of compelling all wheeled vehicles to display a light at night was discussed. Such a measure was asked for in the last Legislature, but the farmer vote downed it. However, it will be tried again this season, and it is hoped that it will be passed successfully.

NEW JERSEY AUTOISTS ARE ORGANIZING.

NEW BRUNSWICK, N. J., Nov. 9.—The activities of W. C. Crosby, acting president of the Associated Automobile Clubs of New Jersey, and H. A. Bonnell, its secretary, have resulted here in the formation of the Middlesex County Automobile Club, the second meeting of which was held to-night. While L. A. Voorhees is the choice for president, Frederick Schussler for treasurer, and A. W. Clark for secretary, it was decide dto postpone the actual selection of officers until the nominating committee presents additional names for vice-presidents to represent the club in various sections of Middlesex county.

Those present at the meeting to-night also included: F. H. Elliott, secretary of the A. A. A.; J. V. Z. Anthony, president, and J. H. Edwards, ex-president, of the Automobile Club of Hudson County; Jacob Mason, vice-president of the New Jersey Automobile Trade Association; and Dr. J. R. English and Joseph Wood, ex-presidents of the New Jersey Automobile and Motor Club.

OLDS MANAGER DENIES COMBINATION STORY.

LANSING, MICH., Nov. 5.—Frederick L. Smith, general manager of the Olds Motor Company, denies that the company contemplates combining with other concerns under J. Pierpont Morgan.

"There is no foundation for the story," said he. "The Olds Motor works is on a firm financial basis, and is enjoying the best business in the history of the concern. The idea of selling the interests or joining with any combination has never been entertained."

FORD CAPITAL INCREASED TO $2,000,000.

LANSING, MICH., Nov. 5.—Papers were filed with the Secretary of State to-day for an increase of the capital stock of the Ford Motor Company, Detroit, from $150,000 to $2,000,000.

WHITE STEAMER WINS THE DESERT RACE.

PHŒNIX, ARIZ., Nov. 10.—The White steamer won the race from Los Angeles to Phœnix. The White arrived at 6.33, the KisselKar at 7.41; the Elmore at 8.45; the Franklin at 9.50 P. M., Pacific time.

Tbe Franklin had several bours' lead in California, but went astray on the desert, and the driver slept four hours until daylight, fearing to make a bad matter worse with a false start.

President Bullard of the Automobile Club says the White won, the Elmore second, KisselKar third, and Franklin fourth, but no official determination will be made until the arrival of mailed reports, showing the time deducted at the time the Colorado River was crossed.

RAILROADS GRANT REDUCED RATES TO A. A. A.

During the coming show season the American Automobile Association is to hold special meetings, the first series being scheduled to take place January 4 to 7, or during the week of the first show to be held at the Palace under the auspices of the American Motor Car Manufacturers' Association, and which will open New Year's eve. The second series of meetings will be held January 19 to 23 inclusive, during the week of the show at the Garden under the auspices of the Association of Licensed Automobile Manufacturers, which opens January 16 and continues for one week. At the request of the A. A. A., the Trunk Line Association has granted a special reduction of a fare and three-fifths for the round trip to members of the three A's desiring to attend either of these meetings. For the former, tickets can be purchased from December 31 to January 5, good returning up to and including January 11, while for the second meeting tickets must be purchased January 15 and 21, and will be good up to and including January 27 for return. Only members of the clubs affiliated with the American Automobile Association, or individual members of the latter, are entitled to the reduction. Autoists who are already members of the A. A. A. may file applications witb tbe secretary, Frederick H. Elliott, at national headquarters, 437 Fifth avenue, New York, where the meetings are to be held.

MORE EUROPEAN BUYERS OF KNIGHT PATENTS.

PARIS, Nov. 5.—It has now been ascertained that the Knight silent engine will be adopted on some of the Panhard-Levassor models next season. Though it has been known that Panhard has been testing the motor for the past few months, the officials of the company persistently denied any knowledge of it, and only a few days ago declared that they would have nothing new for the coming season. As chassis fitted with the Knight engine have been seen on the road in the hands of testers, it became impossible to deny that it was being studied at the Panhard factory, and this week official announcement was made that the patents had been brought.

It is not yet known on how many models the new engine will be fitted, or what modifications on Knight's original patent have been made. Each of the firms buying the patents is free to make whatever changes it may consider necessary, and it is certain that Panhard, like the others, will adopt certain modifications.

According to rumor, the Knight patents have been taken up in Germany by the Mercedes company and in Italy by the Fiat firm. No official confirmation of this can, however, be obtained. All that is certain is that in England Daimler will apply the Knight principles to all 1909 models, that Minerva will do the same in Belgium, and that Panhard will use it to some extent in France.

CHICAGO'S LIST OF EXHIBITORS BREAKS THE RECORD

NINETY-TWO makers of pleasure vehicles are already entered to exhibit at the Chicago show, with several still remaining on the waiting list. The high water mark in the previous show was ninety. The prospects of the big western exhibition, scheduled for February 6-13, are that in point of size it will exceed any previous automobile show ever held here or abroad. All spaces allotted up to date have been accepted.

The exhibitors, as will be seen on reference to the list, include practically every manufacturer of note, and, in addition, several who have not previously exhibited. As usual the Chicago list contains the names of several makers who will exhibit at no other show. There will be 12 automobile exhibits in the basement of the Coliseum Annex, the names of which are not included in the accompanying list, but will be announced later.

FIRST REGIMENT ARMORY.

Kissel Motor Car Co., Hartford, Wis.
Speedwell Motor Car Co., Dayton, Ohio.
Buckeye Mfg. Co., Anderson, Ind.
Jackson Automobile Co., Jackson, Mich.
Columbus Buggy Co., Columbus, Ohio.
Moon Motor Car Co., St. Louis, Mo.
Atlas Motor Car Co., Springfield, Mass.
Dorris Motor Car Co., St. Louis, Mo.
Overland Auto Co., Indianapolis, Ind.
Motorcar Co., Detroit, Mich.
Pope Motor Car Co. (Waverley), Indianapolis, Ind.
W. H. Kiblinger Co., Auburn, Ind.
Mora Motor Car Co., Newark, N. J.
Nordyke & Marmon Co., Indianapolis, Ind.
Moline Automobile Co., E. Moline, Ill.
Auburn Automobile Co., Auburn, Ind.
Anderson Carriage Mfg. Co., Anderson, Ind.
Chicago Coach and Carriage Co., Chicago, Ill.
Rapid Motor Vehicle Co., Pontiac, Mich.
Black Mfg. Co., Chicago, Ill.
Meteor Motor Car Co., Bettendorf, Ia.
Streator Motor Car Co., Streator, Ill.
Staver Carriage Co., Chicago, Ill.
Anderson Carriage Co., Detroit, Mich.
Model Automobile Co., Peru, Ind.
J. V. Lindsley & Co., Dowagiac, Mich.
Fort Pitt Motor Mfg. Co., New Kensington, Pa.
Wayne Works, Richmond, Ind.
Gaeth Automobile Co., Cleveland, Ohio.
Berliet Import Co., Chicago, Ill.
Rauch & Lang Carriage Co., Cleveland, Ohio.
C. P. Kimball & Co., Chicago, Ill.

MOTOR CYCLE SECTION—ANNEX SECOND FLOOR.

Minneapolis Motor Cycle Co., Minneapolis, Minn.
The Pierce Cycle Co., Buffalo, N. Y.
Merkel-Light Motor Co., Pottstown, Pa.
Reading Standard Co., Reading Pa.
New Era Gas Engine Co., Dayton, Ohio.
Bicycling World, New York.
Magnet Motor Co., Chicago, Ill.
Motorcycle Illustrated, New York.
Hendee Mfg. Co., Springfield, Mass.
Harley-Davideon Motor Co., Chicago, Ill.
Excelsior Motor Mfg. Co., Chicago, Ill.
Wagner Motor Cycle Co., St. Paul, Minn.
Consolidated Mfg. Co., Toledo, Ohio.
Ovington Motor Co., New York.
Aurora Automatic Machinery Co., Aurora, Ill.
Thiem Mfg. Co., Minneapolis, Minn.
Auto-Bi Co., Buffalo, N. Y.
American Motor Co., Brockton, Mass.
N. S. U. Motor Co., New York.
The Hornecker Motor Mfg. Co. Geneseo, Ill.
Armac Motor Co., Chicago, Ill.

COLISEUM MAIN FLOOR.

Winton Motor Carriage Co., Cleveland, Ohio.
Pope Mfg. Co., Hartford, Conn.
E. R. Thomas Motor Co., Buffalo, N. Y.
Stevens-Duryea Co., Chicopee Falls, Mass.
Peerless Motor Car Co., Cleveland, O.

Last year's attempt to organize a motor-cycle department was only partially successful. Manufacturers delayed their applications to such an extent that it was necessary to allot the space intended for them to other applicants and several motor-cycle exhibits were, in consequence, forced into the basement and Armory gallery. This year the responses were numerous and prompt, so that practically all of the motor-cycle exhibits will be found grouped on the second floor of the Annex. In 1907 there were 11 exhibitors of motor cycles. In 1909 there will be 21.

Accessory manufacturers will occupy the galleries of the Coliseum and Armory, the second floor of the Coliseum Annex and a part of the basement. There have been a greater number of allotments than ever before. A complete list will be ready about a week hence.

Elmore Mfg. Co., Clyde, Ohio.
Woode Motor Vehicle Co., Chicago, Ill.
Thomas B. Jeffery & Co., Kenosha, Wis.
Babcock Electric Carriage Co., Buffalo, N. Y.
Baker Motor Vehicle Co., Cleveland, O.
F. B. Stearns Co., Cleveland, O.
Reo Motor Car Co., Lansing, Mich.
Packard Motor Car Co., Detroit, Mich.
Everitt-Metzger-Flanders Co., Detroit, Mich.
Premier Motor Mfg. Co., Indianapolis, Ind.
Studebaker Automobile Co., South Bend, Ind.
National Motor Vehicle Co., Indianapolis, Ind.
Haynes Automobile Co., Kokomo, Ind.
The White Company, Cleveland, O.
Dayton Motor Car Co., Dayton, O.
Cadillac Motor Car Co., Detroit, Mich.
Maxwell-Briscoe Motor Co., Tarrytown, N. Y.
Locomobile Co. of America, Bridgeport, Conn.
H. H. Franklin Mfg. Co., Syracuse, N. Y.
Apperson Bros. Automobile Co., Kokomo, Ind.
Buick Motor Co., Flint, Mich.
Holsman Automobile Co., Chicago, Ill.
Pope Motor Car Co. (Toledo), Hartford, Conn.
American Locomotive Co., New York.
George N. Pierce Co., Buffalo, N. Y.
Olds Motor Works, Lansing, Mich.
Corbin Motor Vehicle Corp., New Britain, Conn.
Matheson Motor Car Co., Wilkes-Barre, Pa.
Lozier Motor Co., New York.
Bartholomew Co., Peoria, Ill.
Chalmers-Detroit Motor Co., Detroit, Mich.
DeLuxe Motor Car Co., Detroit, Mich.
Mitchell Motor Car Co., Detroit, Mich.
Rickette Auto Works, South Bend, Ind.

COLISEUM ANNEX, FIRST FLOOR.

Simplex Motor Car Co., Mishawaka, Ind.
York Motor Car Co., York, Pa.
Auetin Automobile Co., Grand Rapids, Mich.
Oakland Motor Car Co., Pontiac, Mich.
Pennsylvania Auto-Motor Co., Bryn Mawr, Pa.
Midland Motor Co., Moline, Ill.
Welch Motor Car Co., Pontiac, Mich.

SPECIAL NIGHTS FOR THE PALACE SHOW.

The wants of the inner man are to be well looked after at the coming show at Grand Central Palace. The restaurant will be in the second gallery and will occupy a much larger space than formerly. It will represent an up-to-date German grotto with mosaic flooring and roof covered by vines.

The annual A. M. C. M. A. luncheon will take place Tuesday, January 5, at the Hotel Manhattan, which has been chosen as headquarters for the association during show week.

Special nights as usual will be set apart for various classes. Following a private view of the show on the afternoon of December 31, will come a gala New Year's Eve night. The other special nights will be: Friday, army and navy; Saturday, students; Monday, engineers; Tuesday, society; Wednesday, merchants; Thursday, municipal.

AMERICAN IDEAS IN CONSTRUCTION AND EXPOSITION

By CHARLES CLIFTON, President of A. L. A. M.

A MOST significant note in the changing day is the sound of the automobile horn. The automobile industry, after a growth of unparalleled rapidity, has been among the first to recover from recent financial conditions. Tbis can be explained by the popular economic demand for self-propelled machines, and the ability shown by the leading manufacturers in the tight-money market. The legitimate automobile manufacturer is typified in an essentially modern man; progressive, or he would not be in the business; alert and full of nervous energy, if he shall succeed and survive. As in the mechanical development of their automobiles, in all their complexity and unknown quantities and ramified interests and industries, the Association of Licensed Automobile Manufacturers has done in several lines, work which is substantially of educational character.

In the preparation of the "Hand Book of Gasoline Automobiles," now in its sixth edition, good use in terms applying to the elements of an automobile is determined. And matter is included in or excluded from the Hand Book *pari passu* as it is really required by the public for its proper information, or calculated to lead to consideration of important points, always short of confusing the well-informed man in his adequate examination of tbe state of the market.

Standardization.—The work of the Mechanical Branch in frequently breaking virgin ground in automobile engineering, in original research connected with raw and finished material, in the establishment and intelligent use of mechanical and material standards, is well known; the evidence being the magnificent American cars and chassis exhibited at Madison Square Garden shows, and the eminently satisfactory service of the cars for years in the hands of private owners and in contests of nearly all kinds.

The great element of progress in the nineteenth century has been the recognition of the value of scientific gneralizations in every department of human conduct. Our science has become sounder, our understanding of its applications clearer; and the public has recognized that scientific conduct of a business means tbe substitution of universal experience, learned with difficulty and applied with toil, for the narrower range of individual experience which was at the disposal of the so-called practical men of fifty or one hundred years ago. Of this change the engineer is the representative and leader.

Standardization does not mean that cars will all be the same but bear different names. Given identically the same materials, the same designs, and the same class of skilled workman, the different factories will turn out cars of differing merit, regardless of the extent to which standardization may be carried deliberately or unconciously.

Digest of Periodicals.—The multitude of periodicals published, automobile, engineering, and allied, has recently been called a deluge. Realizing that the art and science of the automobile, as expressed in its technical literature, were developing faster than busy engineers could compass them, the leading association of manufacturers established some years ago a technical library department containing the best books and domestic and foreign periodicals, and regularly issued to its members a digest indicating what was new or worthy in automobile design and construction, including what might be of value as suggestive on account of immediate or future practical bearing.

It has become almost a truism that no other invention has in so short a time excited such a powerful influence upon mechanical engineering and its allied arts and sciences, or interested such a number of experts in its service, as the automobile. The nearest, perhaps, is the electric trolley system in the years of its first rapid development, but this involved quantity rather than quality and variety of work. The automobile industry has called upon all branches of engineering, mechanical, electrical, metallurgical—to surpass at a moment's notice the highest point of achievement reached by long years of growth. It "hustled the steel-maker." In view of the highly advanced state of mechanical engineering in all its branches a dozen years ago, it would seem tbat the automobile builder might have been satisfied with facilities so far in advance of those enjoyed by pioneers in earlier arts, but such has not been the case. Year by year his demands have become more insistent for finer materials and better tools. While for several years the American industry rested within the lines of the best general engineering practice, it some time ago took the master hand and rapidly forced the extension of all branches of metallurgy and machine work. One by one the leading material and tools makers awakened to the fact that the best the open market offered was not good enough for the American automobile. Laboratories were fixed up in the different shops for testing all materials, with a rigid system of rejection for falling below specification. About 1905 the Association of Licensed Automobile Manufactures inaugurated this work.

Mechanical Branch.—The engineers and mechanical heads of the principal automobile makers, composing the Mechanical Branch, have been quick to draw to their logical and accurate conclusion the data on various engineering subjects jointly and severally submitted and discussed at their periodical meetings. Many of the members of the Licensed Association have elaborate laboratories of their own for determining chemical and physical properties of materials.

Numerous A. L. A. M. standards have been made public. The work the Mechanical Branch has been carrying on is in large part for the benefit of the whole industry and so freely given. The proceedings of the body constitute three large thoroughly edited and indexed volumes.

Road Racing.—So much is an outline of how the machines are designed and built. Another phase of the industry is road racing, which within reasonable limits is good for all concerned. Its results are beneficial to the maker, in that it brings out weak points in design and construction that can be corrected easily. Incidentally it is a spectacular and inexpensive form of amusement for hundreds of thousands of people.

Ninth National Automobile Show.—But as a yearly event the converging point of past and future items of interest, the show in the thing the result of the foresight, ingenuity and labor of the factories during the past year. And yet the preparation and conduct of the show itself is alone a world of work and detail. For many months the modus operandi of the Ninth Annual Automobile Show which will open at Madison Square Garden on the third Saturday of January has been under way. The volume of labor and responsibility entailed on the Show Committee and its secretary is difficult to realize. The culminating success does not disclose what has passed to bring it to fruition. A clear conception and knowledge of the art and trade are necessary.

Madison Square Garden is made a complete city in itself. For example, a telephone system larger than used in any city of the second class is especially installed. Mail is received daily.

The show is the biggest trade exposition held in New York, as to variety and number of exhibits, the number of square feet of floor space utilized, value of goods shown, number of attendants required in conducting the show as a whole and its exhibits separately. Over three thousand employees and attendants are regularly on hand. The captains of the industry are there.

In the preliminary stages, engineers measure up the building to make use of all available area for exhibition purposes, considering the comfort and safety of the public as to passageways and regular and emergency exits.

Then the architect studies the building, to get from artistic standpoints, a harmonious decorative scheme, in keeping with the

floor plans of the engineers; lending itself to the practical side of a trade exhibition.

Now follow the constructing builders, to overhaul the building, to bring about the required result. Henceforth the work of preparation divides itself into two great divisions, one of which involves the almost endless communications with the trade regarding space, the preparation of thoroughly indexed rules for the conduct of the show, just to the large and small exhibitors and the management.

Above all a higher standard is maintained. Exhibits which could reasonably be considered freakish or of negligible interest, or irrelevant to the needs of the motorist, are prohibited.

The A. L. A. M. Show Committee has not only maintained the highest standard in the art of show preparation and conduct, but has been the pioneer in many methods now generally accepted in this country as matters of course. Conspicuous among these is the plan of having uniform decoration for all exhibits, obviously necessary for the desired effect of suitable background and setting for the introduction of the new automobile models. Automobile shows abroad have never reached this stage of development.

The other great division of work in making the show is that of the architect and decorator, who have just searched the world over for what is appropriate and best and newest in art. An astonishing number of different kinds of workmen are employed by them, artists, carpenters, drapers, carpet-layers, plaster workers, modelers, sculptors, electricians, telephone gangs, linemen wiremen, cabinet makers, scene painters, plain and fancy iron-workers, sign painters, steeple jacks, riggers, laborers, freight handlers. Labor is certainly represented in its varied forms.

The scene of the show nearing completion for opening is one of the most interesting and thrilling events it falls to the lot of the average man to see. Great hurry, together with exactitude and high-class work; great crowds of workmen; numerous foremen and superintendents directing and driving the men; designers and contractors whose increased reputations are involved, work ceaselessly for days without sleep. Wit, humor, camaraderie, permeate the whole.

After the show is installed and opened the complete city, under the A. L. A. M. management, is evident, divided into the business and financial sides.

Complete in and out freight and express offices are in working order. Over ten thousand pieces of mail are received daily. The telegraph ticks. The telephones at their busiest time handle more calls than the Syracuse telephone system at its busiest time. A complete day and night police force, uniformed and plain-clothes men, properly officered, patrols the Garden. Ticket-sellers, takers, checkers, counters, porters, cleaners, electricians, wiremen are busy. Decorators constantly keep their work in shape. Carpenters and carpet layers are always at hand.

Band and orchestres attend. Cafés, restaurants and rathskellers are in operation.

The most remarkable feature of all in some ways, is the demolition of the show. What have taken hundreds of people months to get ready in advance, materials, several million dollar's worth of exhibits, are, beginning at eleven o'clock the last night, within the following fifteen hours, packed and shipped from the Garden; the entire exhibit, probably one hundred car-loads of freight, removed, the structure work taken down and the building put in its original condition.

But the object has been accomplished. The A. L. A. M. yearly models have as a whole been suitably submitted to the public.

STATISTICS REVEAL STEADY GROWTH OF THE INDUSTRY

As a commentary on the growth of the automobile industry and the increase of business in standard high-grade cars, some statistics compiled by M. L. Downs, secretary of the show committee of the Association of Licensed Automobile Manufacturers, have an especial interest. According to the actual figures, the number of exhibitors at the national show in Madison Square Garden has increased 100 per cent. since 1905. In the same period the amount of floor space utilized for this show in Madison Square Garden has increased 40 per cent. This increase in floor space has been cumulative, a little being gained each year through ingenious engineering.

At the next show, January 16-23, there will be about 5,000 feet more space available than there were last year. This additional room has been gained this time chiefly by manipulating the plans of the elevated platform and what was last year the mezzanine floor. Last year there was a mezzanine gallery at the rear of and about four feet above the elevated platform that is built over the boxes. At the coming show there will be no change of level, but the boxes and other seats will be floored over evenly, and there will be a ten-foot passageway between the vehicle exhibits at the front of the platform and the display of accessories at the back of it. The platform will overhang the main floor as before.

The gain in the number of exhibitors represents not so much an increase in the ranks of the manufacturers of licensed cars as it does new exhibits of accessories. There will be more than three hundred exhibitors in the Garden this year, which will exceed all former records.

At the shows in the Garden it has been a problem always how to arrange the signs at the various spaces so that they shall present the minimum of interference with the artistic presentment of the whole. Uniformity in the board signs bearing the names of the makers was first achieved, but even then they were a jarring note in the decorative harmony, and ingenuity was exercised to devise some plan wherehy these necessary guideboards might be made a part of the decorative scheme. The satisfactory method seems to have been found now. This has been accomplished by devising an ornamental lamp-post to be placed at each exhibitor's space, the exhibitor's name appearing on the glass panels of the lamp. This feature, it is expected, will work a remarkable change in the general aspect of the whole show from an artistic viewpoint. A suitable setting is as essential to the success of an industrial show as to any other exhibition.

PITTSBURG SHOW THE LAST OF MARCH.

Pittsburg, Nov. 9.—The next annual show to be held under the auspices of the Automobile Dealer's Association will open in Duquesne Garden, Saturday evening, March 27, 1909, and carry through to the following Saturday. Under the leadership of its president, W. N. Murray of the Standard Automobile Company, the association is making preparations to far excel anything that has heretofore been seen in Pittsburg in the show line. The other officers of the association are: Vice-president, A. L. Banker, of Banker Brothers Company; treasurer, George T. Moore; secretary, Charles F. McLaughlin.

NEXT GRAND PRIX IN CHATEAULAND.

PARIS, Oct. 31.—Chateauland is practically decided upon as the scene of the next Grand Prix. This week a deputation from the town of Angers waited on the Racing Board, gave particulars of their local organization, the progress made towards the collection of the $20,000 subvention, and asked for a definite answer. Though no official decision was given, it is understood that after a final visit to the course by the members of the Racing Board the Angers triangle will be accepted.

Already a large plot of land has been picked out for grandstands at St. Germain des Pres, about twelve miles from the town of Angers. As the stands will be on the outside of the course and the gasoline station on the inside, it will be possible to arrive at headquarters at any time during the race. A good road from Angers reaches the grandstands by following the banks of the River Loire.

Although 185 miles from Paris, in a southwesterly direction, the general situation of the Angers course is so favorable that spectators are expected to be almost as numerous as at Dieppe. Saumur is only 25 miles to the east along the beautiful Loire Valley; Tours is about 65 miles away; Blois is not more than 95 miles away; Le Mans is about 50 miles to the north, and all round are small towns capable of providing excellent accommodation for tourists. The course selected is roughly triangular shaped, two sides being straight and the third rather winding, the total distance round being 46.1 miles. It is believed that with such a length not more than 74 cars should be allowed—one car per kilometer. If, as is quite possible under the reduced core regulations, this number should be exceeded, the club would limit the entries to two per firm.

Owing to troops now serving but two years with the colors, it will be impossible next year to protect the Grand Prix course by military, as on previous occasions. It has been decided, therefore, to employ gendarmes, mounted and on foot, for the most crowded portions of the course, to swear in the greater portion of the 600 road menders of the department, to employ a large number of policemen, and to put club officials at various points round the course.

RAISING THE LIMIT FOR THE BRIARCLIFF.

The committee of New York tradesmen and entrants, to whom the deed of gift for the running of the Briarcliff race was intrusted, has been discussing the weight and cylinder limits for next year's race. It is said to favor 5 1-2 inch cylinders, equivalent to 94.9 square inches for four cylinders, and 2,500 or 2,600 pounds weight limit. This means greater cylinder volume and lighter than the international limits this year and also the limits decided upon for next year. It is argued that the race being intended as a test for high powered touring cars, these increased limits are desirable. If these limits "go," the committee will have to be careful not to advertise their race as an international contest, or they may get into trouble with the Automobile Club of America, under whose jurisdiction international contests in this country are now held, in accordance with the recent agreement between the club and the American Automobile Association.

LYNN WILL TRY AUTO MAIL COLLECTING.

LYNN, MASS., Nov. 9.—Collection of mail by automobile has been introduced in this city by Postmaster Craig, and it is believed that this is the only city in New England with this up-to-date means of handling mail. The postmaster experienced the difficulty in covering the city and making as many collections as were needed by men on foot or with horse-drawn vehicles, and he therefore went to Washington and conferred with the postal authorities. They approved of his plan, and Postmaster Craig has installed a Ford car fitted with a large mail box. With the car three collections a day are made, and only one man is required. Previously the work was done by two horses and wagons and two men.

Five 1909 De Luxes Sold to Residents of Marquette, Mich.

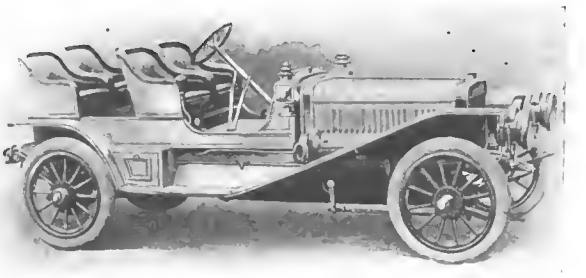
FRENCH MAKERS TO INQUIRE INTO ACCIDENTS.

PARIS, Nov. 5.—Daily newspapers get hold of so many automobile accidents that never occurred, and exaggerate those that did to such an extent that the Marquis de Dion will ask the A. C. F. to vote a special fund for the control of all reported mishaps. The movement was started by a blood-curdling story which got into all the European newspapers of a high-speed car running down a child in the presence of its father. The distracted parent picked up the body of his son, then fired revolver shots after the car, killing the driver and a beautiful girl sitting by his side. Without control the car sped on, mounted the footpath, overturned, and fatally injured another lady occupant of the vehicle.

On official injuiry being made the police authorities could only find one accident in the district named during a period of six months, on which occasion an automobile ran into a horse buggy, the people quarreled over the responsibility, one of the automobilists fired his pistol in the air, but no one was either injured or killed. An accident at the Port Maillot, Paris, in which a cyclist collided with an automobile and was killed was reported in the papers as being caused by the motor vehicle. The police report was to the effect that the cyclist met his death by imprudence, the automobile driver being blameless. Not a single paper publishing the original story would accept the correction, however. With the fund requested by the vice-president of the French Club all motor accidents would be inquired into, and where incorrectly reported correction would be demanded.

SMOKY EXHAUST EXAMINATION IN PARIS.

PARIS, Nov. 5.—So severe are the Paris police against smoky exhausts that the Automobile Club of France has been obliged to fix up an anti-smoke apparatus in its garage. It is a simple apparatus, consisting of a metal pipe leading into the chimneys of the building, provided with a flexible end fitting over the car's exhaust pipe, and an electric fan operating a ventilator. If it is discovered, on starting out, that an engine is smoky, it is immediately linked up to the piping and allowed to run until all the extra oil has been drawn off. It is proposed to fix similar apparatuses in all the city garages. Their use would be cheaper than being caught by the police and being summoned into the municipal courts for smoking.



1909 $3,000 Winton "Six" Roadster, of 48 Horsepower.

Grabowsky Delivery Wagon Utilized for Charitable Purposes.

A NEW IDEA IN COMMERCIAL CARS.

The Grabowsky Power Wagon Company, Detroit, Mich., will exploit a new delivery wagon, along lines somewhat at variance with customary methods. They will build a line of delivery automobiles, one of which is here illustrated.

Amongst other features, the idea of a demountable power plant is featured. The plan is to afford a ready means of "swapping" power plants in the event a mishap demands some such treatment.

The same company will equip maintenance stations in the various centers of trade, with a view to providing delivery service to all who may care to avail themselves of the same.

AUTOMOBILE SHOW FOR ST. LOUIS.

St. Louis, Oct. 26.—After many weeks of conflicting reports as to the probability of an automobile show for this city during the winter, the announcement is made that the Automobile Dealers and Manufacturers' Association has actually decided to hold an exhibition during the week of February 15 to 20 inclusive. More than twenty-five of the local dealers have signified their willingness to participate.

NO ENDURANCE RUN BY DETROIT DEALERS.

Detroit, Nov. 3.—There will be no endurance run under the auspices of the Detroit Automobile Dealers' Association this Fall.

Plans are already being formulated for the annual show under the auspices of the dealers' association, which will be held some time in December or January, and which promises to be on a more extensive scale than ever.

"Uncle Joe" Cannon Used Chalmers-Detroit in Home Electioneering.

WISCONSIN'S GOOD ROADS AMENDMENT.

Milwaukee, Wis., Nov. 9.—The so-called "Good Roads Amendment" to the State constitution of Wisconsin was overwhelmingly adopted at the general election, November 3, and the State is now required to give aid to highway improvement and construction work. This is the best news Wisconsin owners have had in a long time. The State geological survey has already started work on laying out an elaborate system of State highways, which, when completed, will form a chain of drives and courses throughout the State. Just before the election opponents of the amendment started a campaign story that the whole matter was a plot of automobile owners to get speedways at the expense of the people. The overwhelming vote showed the fallacy of the argument.

The first work under the new amendment is the five-mile boulevard from the city limits of Milwaukee, an extension of Grand Avenue to the county limits, which eventually will form a boulevard half-way across the State on nearly an air line to the capital, Madison. The distance is 85 miles. The cry of "plot" was raised by persons through whose property the road will eventually cut. Evidently it was not considered that such a thoroughfare would enhance the value of the property.

President Joseph Moon in the 1909 Moon Touring Car.

POPE REORGANIZATION ALMOST COMPLETED.

Hartford, Conn., Nov. 10.—Vice Chancellor Howell of Newark, N. J., to-day took under advisement until Thursday a petition filed by counsel for the receivers of the Pope Manufacturing Company asking for instructions regarding an offer of $1,500,000, made by a reorganization committee for the assets, less cash in the hands of the receivers August 1 last, of the Pope company. Should this sale be authorized, as there is every reason to believe that it will, the receivers will at once pay a final dividend of 25 per cent., making 100 per cent. in all, to holders of approved claims against the company.

The vice chancellor also made an order authorizing the sale by the receivers of the Pope company plant at Hagerstown, Md., from which all mechanical equipment has been removed, for $57,500, and of a bicycle factory at Elyria, Ohio, owned by the Federal Manufacturing Company, all of the stock of which is owned by the Pope company, for $35,000.

It was stated by receivers' counsel that the reorganization committee approved of both sales.

It appears that about 98 per cent. of the first preferred stockholders and over 90 per cent. of the second preferred stockholders have given their consent to the reorganization scheme and have deposited their respective stocks in accordance with its terms. The plan provides for the issue of the reorganized company of $800,000 of 6 per cent. notes secured by a first mortgage; $2,500,000 of 6 per cent. cumulative preferred stock, and $4,000,000 of common stock.

A Party of Tourists in a Premier in the Tennessee Mountains.

Cbalmers-Detroit Non-Stop Runs.—What was probably one of the most comprehensive strokes of newspaper automobile publicity yet attempted in the automobile world, was carried off in a highly successful manner on Election Day. In accordance with a carefully prearranged plan, no less than 100 of the new Chalmers-Detroit "30's" were started on a 200-mile non-stop run simultaneously, in different parts of the country. The event was dubbed the "Election Sweepstakes," and in every case official abservers were carried and the gasoline and oil consumption carefully noted. Every Chalmers-Detroit agent notified the home office by wire of the progress of his run, its starting and finishing time, as well as the weather conditions, and the fuel and oil consumption of his car. The telegrams were all in by midnight of Election Day, and an "extra" under date of "Detroit, Midnight Nov. 3," was immediately printed and sent out broadcast, marking the successful culmination of one of the most striking publicity "stunts." According to the results shown, the minimum fuel consumption was eight gallons, and the maximum 16. Every one of the bulletins, or "extras," which were printed in two colors, was sent out under a special delivery stamp, and was in the Detroit post-office at 1 A. M., November 4, so that in many cases Chalmers-Detroit dealers were in receipt of their bulletins the day after the non-stop run was held.

American Car in Sweden.—That an American car is the one best fitted to win the great winter reliability tour held in Sweden each year, is the opinion of Pantus Lindstrom, who is now in this country. Mr. Lindstrom, who is a mechanical engineer, is one of Sweden's best known sportsmen and has driven his own car in all of the winter reliability runs since the first one was held. He is now negotiating for a six-cylinder 60-horsepower Pierce Arrow, with the intention of entering it in the run on his return home. If he carries out his intention the car will be the first one of American make that has ever been entered in this event. Mr. Lindstrom's attention was first attracted to the Pierce Arrow in 1906 when a car of that make, driven by Percy Pierce, won a perfect score in the Herkomer tour in Germany. His determination to buy a Pierce became positive when it scored for both the Glidden and Hower trophies this year.

Locomotive to Show Independent.—Owning allegiance to neither of the big trade organizations, the American Locomotive Company, Providence, R. I., could be happy with either, "were t'other but away," and true to self-established precedent, will hold forth with neither this coming show season. As was the case last year, the American Locomotive car will be shown at the parlors of the Waldorf-Astoria and will have a three weeks' show all to itself, beginning with the opening of the A. M. C. M. A. gathering at the Palace on New Year's eve, and closing with tbe end of the Garden show on January 23. The cars will be shown in the parlors on the Thirty-third street side of the big hostelry.

Spokane's Latest Recruit.—Having watched with interest the success of Seattle's city government in employing automobiles for the use of the city engineer and the department of public works, the business men of Spokane have indorsed the wish of Engineer Ralston for a machine. The plan is at first to divide the use of the car between the city engineer and tbe board of public works. Heretofore he has been unable to visit more than one or two pieces of important work in a day outside the city, but by the use of an automobile he contends that he could see them all in the same time.

Pennsylvania as a Pathfinder.—In preparation for its annual run to Wilkes-Barre and return, January 1-2, the contest committee of the Quaker City Motor Club of Philadelphia used a Pennsylvania car on a two days' trip to Wilkes-Barre and picked out the route. Although the distance from Philadelphia is something like 125 miles, it is especially noteworthy as an endurance route because of the hilly country passed through, the famous Giant's Dispair Mountain being one of the climbs to be made in the course of the run.

Glidden's 50,000-Mile Tour.—Charles J. Glidden, of Boston, is planning to complete his world tour of 50,000 miles started in London in 1901, next year by drives in Spain, Portugal, Tunis, Algeria and Tripoli. He has already driven 46,528 miles in thirty-nine countries. He expects to resume his tour in Algeria next March and contemplates running the total up to 50,000 miles in 45 countries. He has decided to equip his car with Thomas shock absorbers, now being marketed by the Buffalo Specialty Company, Buffalo, N. Y.

Cutting Into Railroad Revenue.—Texas automobile owners are figuring that they are responsible for a considerable loss of revenue on the part of the railroads. At the State Fair at Dallas observations were made of the visiting cars, and it was found that touring parties were present from all parts of the State, a considerable percentage of them in Franklin cars. Believers in the automobile welcome this evidence of the growing popularity of the vehicle, freeing owners of machines, as it does, from the restrictions of railway time cards and reducing distance to a minimum.

Sympathy Not Wanted.—"There can be no doubt that we did have hard luck in the Vanderbilt race," said C. W. Matheson, of the Matheson Automobile Company, recently. "Chevrolet's car went out with a broken cylinder, and Ryall's car was put out of commission by fire. Both of these accidents seemed very strange, inasmuch as these cars had run in the preparatory spins absolutely without trouble. But I am not a candidate for sympathy, and we will do better in future events."

Stearns Prospects in the West.—The success attained by Sales Manager Charles B. Shanks, of the F. B. Stearns Company, on his Western trip has again caused the company to increase the working force both night and day and look for additional building facilities as well. Mr. Shanks reports that at no place did he have any trouble in placing an agency in the hands of people who were not enthusiastic about the prospects of selling all the cars they would be allotted.

More Taxicabs for Gotham.—The latest arrival in the taxicab field of New York City is the long-looked for service of the Hotel Knickerbocker, which made its start last week. The new concern is known as the Universal Taximeter Cab Company, and has for its officers the following: President, J. H. Stack; treasurer, J. H. Norton; secretary, J. F. Mulgrew. The chassis used by this company are made by the Argyll Motor Company, Scotland.

Business Is Better Already.—The best evidence of increased business activity is an increase of orders. The Baker Motor Vehicle Company reports that it has received orders for 16 cars in one day, for immediate shipment, and says that the election of Taft has resulted in telegraphic orders from its agents throughout the United States, demonstrating that many purchasers were waiting to learn the result of the election before placing their orders for cars.

Monogram Oil Scores Heavily.—The fact that the winners of four races out of five held at the opening of the Long Island Motor Parkway, October 10, coupled with the fact that the winner of the 200-mile race in Philadelphia, on the same day, and the winner of the Vanderbilt Cup race, October 24, used Monogram oil, is a source of extreme gratification to the makers, the Columbia Lubricants Company, of New York City.

American Roadster Victories in Texas.—Two leading events in the auto meet of the Texas State Fair, at Dallas, November 1, were won by an American Roadster, driven by Fred I. Tone—the 10-mile for cars of 50-horsepower and the 10-mile free-for-all. In the first event the American kept the lead all the way, finishing in 11:28¾, and the other event was also won with ease. In two trials at the mile, Tone drove in the times of 1:06 and 1:02½.

Another Newcomer.—The Motor Car Repair Company of New York City, which

has been in the repair business for some years, has branched out and joined the manufacturing forces. The new car is to be known as the Prodal, made in two types, a commercial and a pleasure car. The company has moved into its factory at 509-515 West Fifty-sixth street, where the additional space gives plenty of room for this new venture.

American Motor Company Changes Hands.—The entire stock and business of the American Motor Company, of Eau Claire, Wis., has been purchased by R. M. Burdick and C. W. Dandewalker. The factory site on Water street, where this company formerly mannfactured marine motors, is rapidly being equipped for the mannfacture of automobiles, which will be the main feature of the product from now on.

Reading, Pa., to Have Taxies.—Not only are the larger cities taking up the taxicab as a necessary convenience, but the smaller cities are fast joining in. The latest addition to the list is Reading, Pa., where the Reading Automobile Company has ordered six motor-cabs from the H. H. Franklin Manufacturing Company, equipped with the standard 18-horsepower air-cooled motor.

K-W Company Enlarging.—The K-W Ignition Company, 34 Power avenue, Cleveland, reports it has found business so successful during the past year that it has recently completed improvements which double the manufacturing space, and at present is busy installing new machinery. The new equipment includes facilities for manufacturing K-W coils and an impregnating plant.

Winton Sales Good for 1909 Cars.—Sales Manager Churchill, of the Winton Motor Carriage Company, feels well satisfied with the sales of Sixes which have been so far recorded. He is especially pleased by the increase in individual orders which the company has received, saying that the number of these is far ahead of the old record made in 1905 with the Model K.

Stearns Company Will Use Hele-Shaw Clutch.—The F. B. Stearns Company, of Cleveland, O., will use the Hele-Shaw clutches, manufactured by Merchant & Evans Company, of Philadelphia, Pa., on their new 25-horsepower shaft-drive car. Many European makers have used this clutch for some time past.

Bendix Company to Move Factory.—The Bendix Automobile Company, which has had its factory and offices in Chicago, has completed arrangements whereby it will move to Logansport, Ind., where the force is expected to be increased from 300 to 500 men.

IN AND ABOUT THE AGENCIES.

American Locomotive, Chicago.—The American Locomotive Company has just completed arrangements for a branch at Twelfth street and Michigan avenue, Chicago. The manager in charge is Benjamin C. Day, who, before joining the American Locomotive Company, was manager of the Winton branch in Chicago. Associated with Mr. Day in the selling department will be B. C. Hamilton, of Chicago, and R. L. Malkin, from the New York headquarters. Adell Starr, an expert from the factory, has been sent on to take charge of the repair work.

In speaking of the new branch and the reasons for its establishment, James Joyce, manager of the automobile department of the American Locomotive Company, has this to say: "Next to maintaining the distinctive quality of the Locomotive car, the company has been most concerned with its reputation for taking proper care of its customers. As Chicago is becoming yearly a more important metropolis, it has been deemed best for the Locomotive Company to establish its own branch in the city in order to give its customers of Chicago and the middle West the facilities and attention provided in New York."

Studebaker, Glens Falls, N. Y.—D. H. Colles has leased the new three-story brick garage on Warren street and will handle the entire Studebaker line of gasoline and electrics for 1909, covering the counties of Saratoga, Washington and Warren. Mr. Colles was formerly connected with Miller Bros. garage in Glens Falls.

Reo and Premier, Newark, N. J.—The Howe Motor Car Company, Newark, N. J., which has handled the Reo and Premier cars for the past year, has been purchased by M. F. O'Neill, who will continue the business under the name of the O'Neill Motor Car Company at the same location, 51 Bank street.

Great Western, Kansas City, Mo.—B. L. Corlew, who has for some time been carrying on an auto livery, has taken the agency for the Great Western car, manufactured by the Model Automobile Company, of Peru, Ind. Offices and salesrooms have been secured on Grand street.

Ex-Champion Corbett as an Autoist.

"Gentleman Jim," at one time king of the heavy-weight pugilists, in the Brush runabout, in front of the theater in a Minnesota town, where he was playing.

Locomobile, Cal.—R. J. Leavitt, the agent for the Locomobile in Southern California, has taken over the garage of the Success Automobile Company at Pico and Hill streets, which he will hereafter make his headquarters.

Pennsylvania Tires, Cleveland.—The Cleveland business of the Pennsylvania Rubber Company has been put in the hands of a local concern known as the Pennsylvania Rubber and Supply Company, which has J. C. McLean as manager.

Jackson, Los Angeles.—The A. E. Gump Automobile Company is making preparations to give up the retail agency of the Jackson cars in Los Angeles and will start in as the Pacific Coast distributers for that machine.

Empire Tires, Kansas City.—Hereafter the Stowe Implement Company will be the wholesale agent for the Empire Tire Company in this section while the Jackson Motor Company will continue to act as the retail agent for Kansas City.

Gray & Davis Lamps, Boston.—This well-known firm of lamp makers, with factory and main offices at Amesbury, Mass., has opened a branch in Boston at 747 Boylston street. G. W. Morrill has been appointed manager of same.

Matheson, Baltimore.—The Matheson Motor Car Company of Maryland, with offices at 1002 Morton street, will hereafter act as the distributing agents for the Matheson car in Maryland, Virginia, and District of Columbia.

Thomas Shock Absorber, Philadelphia.—The Penn Square Automobile Company, 1420-28 South Penn square, has been appointed Philadelphia agent by the manufacturers, the Buffalo Specialty Company, of Buffalo, N. Y.

Jackson, Council Bluffs, Ia.—The Jackson agency has been taken for Council Bluffs by Henry Sperling, who has for some time been the agent for the International Buggy Company and the Detroit Electric.

Genesee Garage Company, Syracuse, N. Y.—This concern has taken possession of its new salesrooms at 242 West Genesee street. The company is agent for the Peerless, Cadillac, and Pope-Hartford.

Perfection Springs, Boston.—The Perfection Spring Company, of Cleveland, has established a branch office in the Oliver Building, Boston, from which point the Eastern and export trade will be handled.

Cadillac, Washington and Idaho.—The Bringham-Fenn Motor Car Company, with temporary headquarters on Broadway, Seattle, has taken the selling agency for the Cadillac in Washington and part of Idaho.

Pfanstiehl Coils, Boston.—The Bi-Motor Equipment Company, 177 Portland street, Boston, has been appointed New England distributer for this well-known make of spark coils.

Regal, Nashville, Tenn.—J. O. Caldwell, Jr., formerly engaged in the automobile business in Boston, has located in Nashville, Tenn., where he has taken the agency for the Regal cars.

Pennsylvania, Wilmington, Del.—The Pennsylvania car will be represented in Wilmington, Del., by the Bradford Automobile Company, who also have the agency for the E-M-F.

Peerless, Trenton, N. J.—Peerless cars will be represented in Trenton, N. J., by Robert C. Manning, who has bought out the Trenton Auto Garage and Supply Company.

Stoddard-Dayton, Harrisburg, Pa.—The Cox Automobile Company, of Harrisburg, has secured the agency for the Stoddard-Dayton cars for the coming season.

Franklin, Reading, Pa.—The Reading Automobile Company, 26 South Fifth street, has taken the agency for the Franklin cars for the coming year.

Apperson, Los Angeles, Cal.—H. O. Harrison, at present agent for the Oldsmobile, has also secured the Apperson agency for the coming year.

Franklin, Pittsburg.—The Franklin car will be represented in Pittsburg by the Standard Automobile Company, of 5917 Baum street.

Franklin, Dayton, O.—The Peckham Carriage Company, St. Clair street, has made arrangements to handle the Franklin car for 1909.

Franklin, San Francisco.—The Consolidated Motor Car Company has been appointed agent for the Franklin car in San Francisco.

Dayton Airless Tires, Elmira, N. Y.—The Dayton "Airless Tires" will be represented in Elmira by O. J. Manley.

Selden, Newark, N. J.—The agency for the Selden car has been taken by the Auto Exchange, of this city.

Franklin, Milwaukee.—The Franklin will be handled in Milwaukee by W. F. Lange, Farrell avenue.

PERSONAL TRADE MENTION.

C. P. Rockwell, formerly assistant sales manager of Thomas B. Jeffery & Company, has been appointed manager of the New England branch of that company in Boston, succeeding V. A. Charles, who, it is expected, will become New England traveling sales representative. Mr. Rockwell is not a stranger in New England territory, as for sixteen years, before joining the Rambler interests, he was connected with the bicycle and automobile sales department of the Pope Manufacturing Company with headquarters at Hartford.

F. E. Castle, better known in trade circles as "Governor," has acquired an interest in the Atwood Manufacturing Company, of Amesbury, Mass., and this concern will hereafter be known as the Atwood-Castle Company. For the present Mr. Castle will continue to make his headquarters at Detroit. The new company has some extensive plans in view.

Marcus I. Brock, who for the second time became sales manager of the Autocar Company in the early part of this year, has just handed in his resignation to that company and it has been accepted to take effect November 30. Mr. Brock leaves with the good will of the company. He has well-formulated plans for the future, though not yet ready to announce them.

Howard E. Coffin, designer of the Chalmers-Detroit car, and chairman of the executive committee of the Mechanical Branch of the Licensed Association, recently sailed for England and will also visit France, Germany and Italy. He will make a report to the Mechanical Branch on any items of interest appearing at the foreign shows.

Eddie Bald, the old-time bicycle champion, and more recently of auto racing fame, has been appointed sales manager of the Mutual Motor Car Company, the Pittsburg agent for the Stearns cars. Mr. Bald was formerly sales manager of the Crescent Automobile Company, of Pittsburg.

F. A. Harris, secretary of the Brush Runabout Company, Detroit, Mich., started on Friday last on the annual trip to the Pacific coast. The company reports that its coast trade has assumed large proportions during the past year and is constantly increasing.

Louis J. Bergdoll, of the Bergdoll Motor Car Company, of Philadelphia, has moved his offices from the headquarters of the Bergdoll Company to the building of the Auto Accessories Company, at the corner of Broad and Vine streets.

George D. Wilcox is now connected with the Omar Motor Company, manufacturers of the Browniekar, Newark, N. Y. Mr. Wilcox was formerly sales manager of the Gearless Motor Car Company, of Rochester, N. Y.

William R. Barnes, formerly of the Hartford Rubber Works Company, has been appointed manager of the Philadelphia branch, to succeed Franklin Kesser, who has taken up other duties at the factory.

P. Tremont Rockett, formerly connected with the sales department of the Maxwell-Briscoe and Stoddard-Dayton Companies, has joined the selling forces of J. M. Quimby & Co., of Newark, N. J.

Willis B. Troy, who was prominent as a manager of racing teams in the old bicycle days, has been engaged by Sidney B. Bowman to look after the Clement-Bayard team in the coming Savannah race.

Lewis H. Kittredge, president of the Peerless Motor Car Company, and secretary and one of the most active and able members of the A. L. A. M., has just returned from a trip abroad.

H. C. Merrill, formerly connected with the Kansas City agency of the Moon car, has accepted a position with the factory as a traveling salesman.

F. A. Stock, formerly of the Auto Stock Company, has gone with the Standard Automobile Company, since this company has taken the agency for the Franklin machines.

A. Gremes, who has been connected with the Chicago office of the Warner Instrument Company, is now in charge of the company's Cleveland branch.

Henry Beegle, formerly with the National Casb Register Company, has gone with the Pittsburg branch of the Winton Motor Carriage Company.

James E. Iams, of the Iams Motor Company, Pittsburg, has gone with the Olds Motor Works branch, in that city.

APPERSONS INCORPORATE.

KOKOMO, IND., Nov. 9.—The announcement is made that Elmer Apperson, who has been doing business as Apperson Brothers' Automobile Company (not incorporated), has just incorporated under the laws of Indiana, retaining the old firm name. The authorized paid up capital is $400,000. This reorganization does not in any way affect the business of the company, as the management remains the same, with the following officers: President and general manager, Elmer Apperson; vice-president, Edgar L. Apperson; secretary-treasurer, Alton G. Seiberling. George H. Strout will continue as sales manager.

In connection with this new move it is interesting to note that Edgar and Elmer Apperson, as pioneers in the automobile industry, have been engaged in their manufacture since 1893.

BUSINESS DIFFICULTIES.

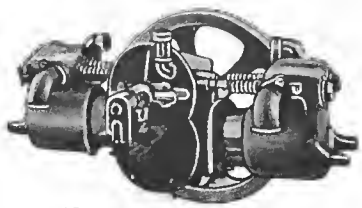
Rainier Motor Car Company.—November 3, the Rainier Motor Car Company, having salesrooms at Broadway and Fifty-fifth street, New York, and factory at Saginaw, Mich., was forced into involuntary bankruptcy by the petition of the attorneys for the following creditors: Pembroke C. Chrysler, J. J. Higgins, and the Hartford Suspension Company. The officers of the company are confident that a reorganization can be effected before long.

"It is simply a case of not having enough cash to get through the product we had planned for 1909," said Paul Lineberger, general manager of the company. "Our assets are far in excess of our liabilities, but during the financial stringency we have been unable to raise the cash to meet our material bills and our large payrolls. With better times at hand we are confident of being able to put through the reorganization we have in mind."

The liabilities of the company are $220,000, of which $50,000 is secured. The cars and material on hand in this city alone are reported to be assessed at $50,000. The company was incorporated in New York City, March 7, 1907, with capital of $1,000,000, made up of $800,000 common and $200,000 preferred stock.

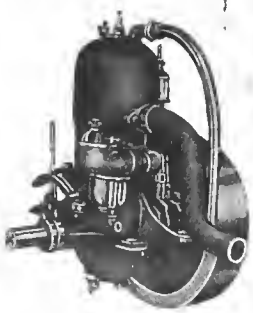
INFORMATION FOR AUTO USERS.

Single and Double Cylinder Motors.—Schaub & Son Machine Company, of 3064 Henshaw avenue, Cincinnati, O., are manufacturing two small motors at a moderate price for marine and automobile use. The



SCHAUB AUTOMOBILE MOTOR.

single cylinder engine is a light, 5-horsepower vertical motor of two-cycle design, built for use in small boats. The two-cylinder is a four-cycle engine of the doubl



SCHAUB MARINE MOTOR.

opposed design, with a 4-horsepower rating. Both motors are water cooled. The manufacturers claim that the full horsepower rating is developed and furnish them complete with pump, timer and carbureter.

English Valve Tester.—This little Instrument is designed to indicate the pressure in pneumatic tires. When a reading is desired, all that is necessary is to

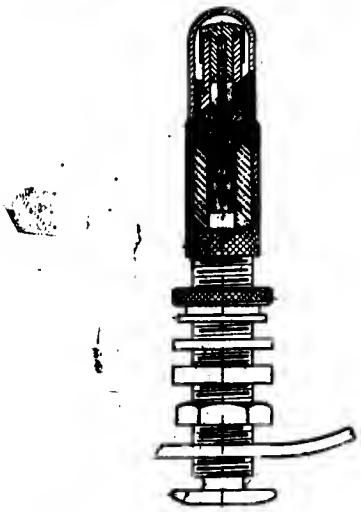
TESTER FOR TIRE PRESSURE.

place the tester over the valve and allow the air to blow through. The instrument is handled in this country by the Motor Car Equipment Company, 1727 Broadway, New York.

"Infallible" Metal Polish.—The U. S. metal polish made by G. W. Hoffman, of Indianapolis, with branches in New York, Chicago and San Francisco, has been used for about fifteen years, which should be a recommendation to those auto users who have had trouble in finding a polish for the bright work on their machine. This polish comes in the form of a paste in three ounce to one pound boxes.

INFORMATION TO AUTO USERS

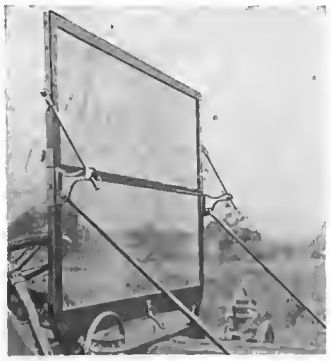
Edco Tire Valve.—Ch. Dien, manufacturers' agent, 35 West Forty-fourth street, New York City, is placing upon the market a tire valve, styled as above, a cross section of which is here given in the illustration. We are enabled to afford advanced information in relation



CROSS SECTION OF EDCO VALVE.

to this very excellent tire valve, notwithstanding the fact that, while letters patent are applied for, the matter is still pending. The vendors of this device need scarcely call attention to the importance of the niche it fills in connection with tires, nor will it be necessary for them to refer to the want they are endeavoring to satisfy. It is pleasant to note that this valve is not kept tight merely if a spring works. As a matter of fact, tightness is the product of direct pressure with no limit to the take-up.

Loring Wind Shield.—J. W. Loring & Son, 140 Union street, Worcester, Mass., have lately put upon the market a new wind shield which has been thoroughly



THE NEW LORING WIND SHIELD.

tested, and which they assert will not rattle nor work loose in any of the positions it may be placed in. The frame of the shield is of mahogany, and the trimmings are of solid brass. It may be adjusted to be held in place both in the upward and folded position by the two thumb screws on each side, which constitute the entire holding device.

New Charging Rheostat.—The Cutler-Hammer Manufacturing Company, of Milwaukee, Wis., offer a rheostat of which the accompanying illustration shows great compactness with the usual slate panel differing in one respect, i. e., the panel is in three sections. The top section includes a Weston volt-meter and the requisite terminal binding posts. The middle section holds a double pole knife switch, the rheostat contact segments, and operating levers,

1 2 3 4

CUTLER-HAMMER CHARGING RHEOSTAT.

while the bottom section is confined to the automatic protective devices. The functional arrangements of this set are explained by the makers as follows: (1) A low-current cut-out which automatically opens the circuit if the current drops to a predetermined minimum. This prevents the battery from discharging into the line should the line voltage drop below that of the battery. (2) A maximum voltage cut-out. This automatically opens the circuit when the battery voltage reaches the point at which the cut-out is set to operate. (3) A solenoid switch, the opening or closing of which "breaks" or "makes" the main line charging circuit. (4) An overload circuit breaker which automatically opens the circuit if the charging current rises to the point at which the breaker is set to operate. This insures the battery against being charged at an excessive rate, which is an extremely important matter, involving the life of batteries to a marked degree.

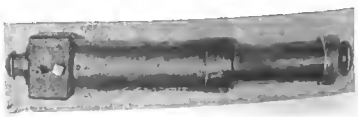
"U K O" Spark Plug.—As produced by the Utility Company, 636 West Forty-fourth street, New York City, this plug is of the mica genera, and among its points of merit it holds a feature of

THE U K O SPARK PLUG.

double insulation, platenoid wire node, two terminal nuts, and a solid brass head. The plugs are guaranteed by the makers and should be very acceptable to users desiring a simple, effective, and trim looking ignition accessory.

Cleanola for Polishing.—Since Cleanola was offered to automobile users more than a year ago, it has come into general use, as it has been found most efficient not only in polishing and preserving varnished surfaces of the car, but the top and leather cushions as well. The compound is manufactured from a secret formula by the Cleanola Company, Pittsburg, Pa., and the makers assert that there are positively no acids, alkalis or volatile oils used in its composition, and guarantee it to be absolutely harmless. The company offers to send either dealers or owners of cars a full size 25-cent package for trial on receipt of 10 cents to cover the cost of packing and mailing.

Hydro-Pneumatic Spring.—The Trojan Hydro-Pneumatic Spring Company, Watervliet, N. Y., are offering to the trade their Hydro-pneumatic Spring, in its improved and perfected form, as a leader for 1909. The illustration shows the device, and, as will be observed, it is symmetrical, strong, neat, and presents no obstructions to its ready application. The makers claim for the device that the springs have been made entirely fool proof, self-adjusting in every way, and great care has been taken



THE HYDRO-PNEUMATIC SPRING.

to manufacture a spring which not only has the best riding qualities, but also improves the looks of the car. Everything is enclosed in such manner as not to let the smallest particle of dust or mud penetrate the spring. There is nothing more to look after on the whole apparatus, once the springs are pumped up. On trucks, etc., considering solid tires, the springs make for easy riding, not unlike pneumatics, and as respects the springs, overloading is not a factor.

VOL. XIX NEW YORK—THURSDAY, NOVEMBER 19, 1908—CHICAGO No. 21

THE AUTOMOBILE

Next the Grand Prix on American Soil

SAVANNAH, GA., Nov. 19.—All is practically in readiness for the American edition of the Grand Prix of France, wherein will participate 14 cars of foreign manufacture and six of American make. The event is not unlike two races in one, for even the most enthusiastic American surcharged with patriotism does not hope for success against the six Italians, five Frenchmen, and three Germans, piloted by such experienced speed kings as Nazarro, Szisz, Hemery, Wagner, Fournier, Duray, and others scarcely less adept and daring. While it is true that the fat prize list has been a factor in securing such a notable array of foreigners, there also exists a desire on the part of France to avenge the German victory of July last at Dieppe and the Italian success of 1907. The tire companies, too, have an interest in the proceedings, and Michelin of France, Continental of Germany, and Dunlop of England are sharing a goodly part of the burden of this Grand Prix on American soil. So many elements enter into success or failure in an automobile road race that the best of form pickers can only guess as to the probable outcome. A wide range of opinion exists as to the winner. One man will fancy Hemery, the 1905 Vanderbilt winner, another Wagner, who scored in the 1906 big American race. But both of these drivers are now at the wheels of other cars, while their American successes were of the Darracq label. Strang, an American, with a foreign mount, is well liked because of his comparatively recent wins with an Italian-built racer. This time he figures as a Renault driver, one of his comrades being Szisz, the Grand Prix of France winner in 1906. Nazarro, with an uninterrupted series of victories in 1907, is of a quiet confidence-inspiring disposition. He will certainly bear watching. Fournier, the well-known Mors star of earlier days, is of the Italian contingent, with Cagno and Piacenza the other helmsmen of Italas. Hanriot and Erle, of the Benz team, and Rigal and Hautvast, the Clement pair, are not well known in this country. Duray, of the French aggregation, was born in San Francisco years ago, and ranks as one of the probable quantities. The second division of the race —which means the struggle of the American cars—will supply an interesting competition, especially involving the six-cylinder Chadwick and the four-cylinder Lozier, with the National and Acme "sixes" and the Simplex and Buick completing the American contenders. The small car race on the day before Thanksgiving will serve as a curtain raiser for the high speed

event. Seventeen little fellows, internationally divided, should supply some lively competition well worth the watching. It will be a source of regret that Herbert Lytle, one of the best of American drivers, will not be able to engage, as he is suffering from an attack of typhoid fever at his home in Toledo. Therefore, another one will have to be named for the Isotta car.

Concluding Arrangements for the Race.

Assignments to the replenishing and repair pits in front of the grandstand was made according to the results of the drawing for starting. The rules are such that all supplies, except tires, must be taken on from the pits in front of grandstand. Tires may be taken from one other station at the opposite end of the course. No one will be allowed to assist in repairs, adjustments, or replacements except the driver and mechanician of the car. This is the order of the start:

GRAND PRIZE RACE.

Place.	Car.	Driver.
1.	Clement	Regal
2.	Lozier	Michener
3.	Simplex	Seymour
4.	Buick	Burman
5.	Chadwick	Haupt
6.	Fiat	Nazarro
7.	Acme	Zengle
8.	Benzo	Hemery
9.	De Dietrich	Duray
10.	Renault	Szisz
11.	National	Harding
12.	Itala	Cagno
13.	Clement	Hautvast
14.	Fiat	Wagner
15.	Benz	Hanriot
16.	Renault	Strang
17.	Itala	Fournier
18.	Fiat	De Palma
19.	Benz	Erle
20.	Itala	Piacenza

SMALL CAR RACE.

Place.	Car.	Driver.
1.	S. P. O.	Juhasz
2.	Lancia	Hilliard
3.	Chalmers	Bergdoll
4.	American-Aristocrat	Manville
5.	Cameron	Cameron
6.	Isotta	
7.	Gregoire	Robertson
8.	Buick	Burman
9.	Maxwell	See
10.	Chalmers	Lorimer
11.	Buick	Hearne
12.	Maxwell	Costello
13.	Chalmers	Burna
14.	Buick	Easter
15.	Maxwell	Munwieler
17.	Maxwell	Kelsey

International signals are used on the course. Speed practice began Monday. One hundred and seventy-two flagmen, in addition to the special officers, guarded the course from 12 o'clock noon until 4 in the afternoon.

The light cars were on the ten-mile course from 12 to 1:30, and the Grand Prize racers had the course from 2 to 4 o'clock. In the light car practice Burman in a Buick skidded on the turn from the White Bluff road into the Montgomery crossroad and his machine went into a tree, smashing the right rear wheel and the running gear. It is doubted if the car can be gotten in shape for November 25. The company fortunately has an extra car in Savannah, which will be substituted for the damaged one. Burman was not thrown from the car by the impact with the tree, but received a severe shaking up. Grennan, who rides with him, was thrown thirty feet from the car, but escaped with a few scratches. Hilliard in the Lancia missed a turn going at high speed and went into a crowd watching the practice. His car was not injured, and no one was hurt, though there were narrow escapes. The light cars did not attempt any fast work on their first tryouts, but the Grand Prize racers made up for this when they took the course half an hour after the little fellows had left it. Duray in the De Dietrich on his first lap went the 25.13 miles in 22 minutes and 12 seconds, better than 69 miles an hour. Wagner was next best, with 23:20 and 23:50. Duray made another lap in 24:55. Nazzaro made a lap in 25:32. Rigal made laps in 23:36 and 27:51. Hanriot made 24:10 and 24:59. Szisz did a lap in 24:24 and another in 25:05. Hemery had laps in 24:58 and 25:04. Hautvast made a lap in 26:59.

The times in the first trials under racing conditions cause the experts to believe that the winner of the race will have to cover the 400 miles at the average rate of about 70 miles an hour to win. In the sprints on some of the longer stretches it is estimated that cars have gone faster than 100 miles an hour.

List of Officials Chosen.

The list of officials chosen for the Grand Prize race is imposing, not only in number, but in titular importance. At the top of the club's announcement of its choice stands the list of honorary referees. It is headed by the Hon. Hoke Smith, Governor of Georgia; the Hon. Joseph M. Brown, the Governor-elect, and Hon. George W. Tiedeman, Mayor of Savannah. Then come the names of the following gentlemen prominent in official list of the two promoting clubs with Jefferson de Mont Thompson, chairman of the A. A. A. Racing Board, added: Frank C. Battey, president Savannah Automobile Club; Harvey Granger, chairman course committee; R. J. Davant, chairman executive committee; E. H. Gary, president, Henry Sanderson, vice-president, Automobile Club of America.

An equally imposing array of judges of the State and local courts is named to act as honorary judges.

The real work of conducting the race will, however, fall upon Robert Lee Morrell, as referee; Fred J. Wagner, as starter; S. M. Butler, chief of timers; Harry T. Clinton, clerk of the course, and Tom Moore, press agent, assisted by W. J. Donlan, of the Savannah Chamber of Commerce. Harlan W. Whipple, A. R. Pardington and seventeen others are to serve as judges.

Ten have been appointed inspectors whose duty it will be to look out for possible fouling at the turns.

Major William B. Stephens will command the military. The following have been ordered to guard the course: Savannah Volunteer Guards, Georgia Hussars, German Volunteers, Irish Jasper Greens, Chatham Artillery, Oglethorpe Light Infantry, Emmet Rifles, Republican Blues and Savannah Cadets.

Attendance from North Will Be Substantial.

The attendance of a large crowd from New York seems assured from the reports of the steamship company and the various railroads and individual promoters of hotel trains and also of a throng of considerable proportions from several other Northern cities, special excursions being in progress of organization in Chicago, Boston and Cleveland. The Cleveland train load is being gathered by the local club.

On the *City of Savannah,* which has been chartered by the A. C. A., and sails Saturday, will go Judge Gary, its president, and other officials of the club. The overflow of sea-going racegoers that day will be carried by the *City of Columbus,* another ship of the Savannah Line. The boats sailing Tuesday and today carried considerable contingents of early invaders.

Big bookings are said to have been made on the Wall street special and the hotels to be run by the Pennsylvania and Baltimore & Ohio roads.

Cash Prizes Now Total $17,850.

In addition to the $8,000 in cash offered by the A. C. A. to the successful drivers, various equipment concerns have put up prizes, which amount to a large sum in the aggregate.

The Michelin Tire Company's prize list is a liberal one. It offers $2,000 to the winner, $1,000 to second, $500 to third, $300 to fourth and $200 to fifth in the Grand Prize race; and $500 to first, $300 to second and $200 to third in the light-car contest, an aggregate of $5,000 for the two races.

Big money is also being put up by the Continental people, who offer $2,000 to first, $1,250 to second and $750 to third in the Grand Prize; and $250 to first, $150 to second and $100 for third in the light-car race.

The Bosch Magneto Company is also out with an offer of cash prizes made up of $500 to first, $250 to second and $100 for third.

The total of these trade offerings is $9,850. The bestowal of the prizes is, of course, conditional upon the equipment of the respective donors being used on the successful cars.

FOURNIER GLAD TO VISIT AMERICA.

In the real pioneer days of automobiling in this country there was no more prominent and popular figure than Henry Fournier, the famous French cyclist, who naturally became a motorcyclist, and as naturally drifted into automobiling.

On Fournier's first American visit he brought with him a motor bicycle and a motor tricycle, and his startling performances on the 10-lap track in Madison Square Garden excited enthusiasm galore, for notbing like it had ever been seen before on this side.

Fournier of France.

His next visit came after he had won the Paris-Bordeaux and the Paris-Berlin automobile races. After incidentally tackling a "wildcat" engine at a blind railroad crossing on Long Island, in which the car was smashed to smithereens and several of its occupants sojourned for a time in a neighboring hospital, Fournier, who had miraculously escaped unscathed and had saved his own life and that of his fellow passengers by some quick manipulation of the steering wheel, took the honors in tbe first straightaway races ever held in America. His Coney Island boulevard mile of :51 4-5 remained unbroken until Charles Schmidt, who served as his mechanician in the Paris-Berlin, accomplished a mile at Ormond-Daytona in :46 2-5 with the *Packard Gray Wolf*.

Fournier is at the head of the Paris-Automobile, one of the largest garages in Paris, and his business duties prevented him from competition for several years, his reappearance coming in the last Grand Prix at Dieppe. His Itala is a powerful car, though it may be somewhat at a disadvantage on the sinuous course at Savannah.

"I am truly glad to visit America again," said the well-known Frenchman upon his arrival Tuesday on the *Kronprinsessin Cecilie*. "I would not care to predict as to my possible success at Savannah, though I hope to quickly become familiar with the course, and shall do my best to figure among the early finishers.

"While the demand in France for big cars has not been as great as before, the monster tourer has received considerable impetus from Michelin's latest innovation in the shape of *les roues jumelles*—a double rim and two tires of a slightly smaller size, instead of a single large tire—a device which greatly increases the life of the tires and does away with a great deal of tire trouble. Yes, oh yes, they were many, very many," be said, with regard to the number of American tourists *en automobile* to be seen in France during the past Summer. "More than ever, in spite of your hard times."

"The field for a good American car on the Continent is excellent," was M. Fournier's opinion on this subject, but he could not say whether he would take one back with him.

Another automobile celebrity to arrive by the North German liner is tbe Chevalier Garibaldi Colteletti, who comes as a delegate of the Automobile Club of Italy to look after the interests of the Italian entrants in the races at Savannab. When asked regarding the status of the Italian industry, he said it was only in a good way where the best known cars were concerned. "But with the exception of such small cars as bad achieved a good reputation, or were very prominently before the public, such as the Lancia and one or two others, none of the newer entrants in the field had been able to survive the bad spell."

STRICKER KILLED IN SOUTHERN RACE.

BIRMINGHAM, ALA., Nov. 17.—During the 24-hour automobile record race on the one-mile fair grounds track, which was poorly ligbted, Emile Stricker crashed into the fence and was killed instantly. Barrows, the mechanic, was seriously thougb not fatally injured. Stricker will be remembered as having been the driver of Robert Graves's Mercedes in the Vanderbilt race, and in the preliminary practice had a narrow escape.

Louis Strang, who was driving the alternate car in the record contest, wired Tuesday from Birmingham as follows:

"Stricker was driving tbe Renault car with me for a twenty-four-hour record. The car skidded completely around while traveling on the turn, and did not burst a tire, nor did the car hit the fence. The only explanation of the accident is that Stricker's long coat caught in the rear wheel, pulling him out of the car. The heavy coat was torn from his body and was taken from the rear wheel after the mishap. The car was found to be in running order and the tires intact after the accident."

FACTS ABOUT THE NATIONAL SIX

The National six-cylinder will enter the race as one of the three American "sixes" to compete for the Grand Prize. There are no foreign sixes entered for the competition. This car has cylinders 5 inches bore and stroke, respectively, and the motor will bave the distinction of being the only product in which both the cams and the crankshaft will run on ball bearings. This motor is the same as that used in tbe National car known as tbe "Big Six," and the makers thereof put forth the claim that the car complete is a regular stock product, using identical materials with the stock car.

National Six-cylinder Candidate for the Grand Prize at Savannah, to Be Driven by Hugh Hardin

STATISTICS OF FIRST RACE FOR GRAND PRIZE OF AMERICA, SAVANNAH, GA., NOVEMBER 26, 1908.

CARS	Driver	H.P.	Cyl.	Bore	Stroke	Cooling	Ignition	Clutch	Transmission	Drive	Track	Wheel base	Wheels	Tires and Rims
BENZ	Hanriot	120	4	6.1	6.3	Centrif. Pump, Honeycomb	H. T. Bosch	Leather Cone	Selective 4 Speeds	Chain	52 in.	108 in.	880 x 120 880 x 120	Michelin, Dem'nt'ble
BENZ	Hemery	120	4	6.1	6.3	Centrif. pump, Honeycomb	H. T. Bosch	Leather Cone	Selective, 4 Speeds	Chain	52 in.	108 in.	880 x 120 880 x 120	Michelin, Dem'nt'ble
BENZ	Erle	120	4	6.1	6.3	Centrif. Pump, Honeycomb	H. T. Bosch	Leather Cone	Selective, 4 Speeds	Chain	52 in.	108 in.	880 x 120 880 x 120	Michelin, Dem'nt'ble
BAYARD-CLEM'T.	Rigal	120	4	6.1	6.3	Centrif. Pump, Honeycomb	H. T. Bosch	Multiple Disc	Selective, 4 Speeds	Shaft	50 in.	107 in.	870 x 90 880 x 120	Dunlaps, Dem'nt'ble
BAYARD-CLEM'T.	Hautvast	120	4	6.1	7.3	Centrif. Pump, Honeycomb	H. T. Bosch	Multiple Disc	Selective, 4 Speeds	Shaft	50 in.	107 in.	870 x 90 880 x 120	Dunlaps, Dem'nt'ble
DE DIETRICH	Duray	125	4	6.1	6.3	Centrifugal Pump	H. T. Bosch	Multiple Disc	Selective, 4 Speeds	Chain	52 in.	107 in.	870 x 105 880 x 120	Dunlaps, Dem'nt'ble
FIAT	Wagner	120	4	6.1	6.3	Centrifugal Honeycomb	H. T. Bosch	Multiple Disc	Selective, 4 Speeds	Chain	50 in.	107 in.	870 x 105 880 x 120	Michelin, Dem'nt'ble
FIAT	Nazzaro	120	4	6.1	6.3	Centrifugal Honeycomb	H. P. Bosch	Multiple Disc	Selective, 4 Speeds	Chain	50 in.	107 in.	870 x 105 880 x 120	Michelin, Dem'nt'ble
FIAT	DePalma	120	4	6.1	6.3	Centrifugal Honeycomb	H. T. Bosch	Multiple Disc	Selective, 4 Speeds	Chain	50 in.	107 in.	870 x 105 880 x 120	Michelin, Dem'nt'ble
ITALA	Piacenza	110	4	6.1	6.3	Centrif. Pump, Honeycomb	H. T. Bosch	Multiple Disc	Selective, 4 Speeds	Shaft	54 in.	118 in.	875 x 105 895 x 135	Michelin, Dem'nt'ble
ITALA	Cagno	110	4	6.1	6.3	Centrif. Pump, Honeycomb	H. T. Bosch	Multiple Disc	Selective, 4 Speeds	Shaft	54 in.	118 in.	875 x 105 895 x 135	Michelin, Dem'nt'ble
ITALA	Fournier	110	4	6.1	6.3	Centrif. Pump, Honeycomb	H. T. Bosch	Multiple Disc	Selective, 4 Speeds	Shaft	54 in.	118 in.	875 x 105 895 x 135	Michelin, Dem'nt'ble
RENAULT	Strang	115	4	.....	6.2	Thermo-Syphon	H. T Bosch	Leather Cone	Progressive 3 Speeds	Shaft	50 in.	105 in.	875 x 90 875 x 120	Continental Dem'nt'ble
RENAULT	Szisz	115	4	.....	6.2	Thermo-Syphon	H. T. Bosch	Leather Cone	Progressive 3 Speeds	Shaft	50 in.	105 in.	875 x 90 875 x 120	Continental Dem'nt'ble
ACME	Zengle	60	6	4.99	5 0	Centrifugal Pump	Jump Spark, Bat. and Mag.	Cork Insert	Selective, 4 Speeds	Chain	56 in.	108 in.	.....	Michelin, Dem'nt'ble
BUICK	Burman	50	4	5.0	5.0	.....	Jump Spark Remy	Cone	Selective, 3 Speeds	Shaft	.....	108 in	34 x 4 34 x 4	Continental Dem'nt'ble
CHADWICK	Haupt	50	6	5.0	5.0	.....	Jump Spark	.....	.....	Chain	56 in.	112 in.	36 x 4 36 x 4	Michelin, Dem'nt'ble
LOZIER	Michener	50	4	5 75	5.25	Centrifugal Pump	H. T. Bosch	Multiple Disc	Selective, 4 Speeds	Shaft	56 in.	124 in.	34 x 4.5 34 x 5	Continental Dem'nt'ble
NATIONAL	Harding	60	6	5.0	5 0	Centrifugal Pump	H. T. Bosch	Cone	Selective, 3 Speeds	Shaft	56 in.	116 in.	34 x 4 34 x 5	Michelin, Dem'nt'ble
SIMPLEX	Seymour	50	4	6.1	5.75	Centrif Pump, Honeycomb	H. T. Bosch	Multiple Disc	Selective, 4 Speeds	Chain	56 in.	126 in.	910 x 110 920 x 120	Continental Dem'nt'ble

STATISTICS OF PARTICIPANTS IN LIGHT CAR RACE AT SAVANNAH, GA., WEDNESDAY, NOV. 25, 1908.

CARS	Driver	H.P.	Cyl.	Bore	Stroke	Ignition	Clutch	Transmission	Drive	Track	Wheel base	Size Wheels Front—Rear	Tires
AM. ARISTOCRAT	Manville	25	3*	3 2/3	3 1/2								
BUICK	Jeffers	18	4	3 3/4	3 3/4	H. T. Remy	Cone	Planetary, 2 Speeds	Shaft	56 in.	88 in.	30 x 3 1/2 F. & R.	Michelin, New Demountable
BUICK	Easter	18	4	3 3/4	3 3/4	H. T. Remy	Cone	Planetary, 2 Speeds	Shaft	56 in.	88 in.	30 x 3 1/2 F. & R.	Michelin, New Demountable
BUICK	Burman	18	4	3 3/4	3 3/4	H. T. Remy	Cone	Planetary, 2 Speeds	Shaft	56 in.	88 in.	30 x 3 1/2 F. & R.	Michelin, New Demountable
BUICK	Hearne	18	4	3 3/4	3 3/4	H. T. Remy	Cone	Planetary, 2 Speeds	Shaft	56 in.	88 in.	30 x 3 1/2 F. & R.	Michelin, New Demountable
CAMERON	Cameron	18	4	3 3/4	4	.....	Cone	Selective, 3 Speeds	Shaft	56 in.	98 in	32 x 3 1/2 F. & R.	
CHALMERS	Bergdoll	30	4	3 3/4	4 1/2	H. T. Bosch	Multiple Disc	Selective, 3 Speeds	Shaft	56 in.	110 in	32 x 3 1/2 F. & R.	Michelin, New Demountable
CHALMERS	Lorimer	30	4	3 3/4	4 1/2	H. T. Bosch	Multiple Disc	Selective, 3 Speeds	Shaft	56 in.	110 in.	32 x 3 1/2 F. & R.	Michelin, New Demountable
CHALMERS	Burns	30	4	3 3/4	4 1/2	H T. Bosch	Multiple Disc	Selective, 3 Speeds	Shaft	56 in.	110 in.	32 x 3 1/2 F. & R.	Michelin, New Demountable
MAXWELL	See	14	2	4 1/2	4	L T. Splitdorf	Multiple Disc	Planetary, 2 Speeds	Shaft	56 in.	84 in.	30 x 3 1/2 F & R	Ajax-Grieb
MAXWELL	Costello	14	2	4 1/2	4	L T. Splitdorf	Multiple Disc	Planetary, 2 Speeds	Shaft	56 in.	84 in	30 x 3 1/2 F. & R.	Ajax-Grieb
MAXWELL	Munweiler	20	2	5	5	L.T Splitdorf	Multiple Disc	Progressive 3 Speeds	Shaft	56 in.	96 in	32 x 4 F & R	Ajax-Grieb
MAXWELL	Kelsey	20	2	5	5	L T. Splitdorf	Multiple Disc	Progressive 3 Speeds	Shaft	56 in.	96 in	32 x 4 F. & R.	Ajax-Grieb
GREGOIRE	Robertson	16	4	3 1/5	5 1/10	H. T. Bosch	Cone	Selective, 3 Speeds	Shaft	52 in.	95 in	810 x 90 mm F. & R.	Michelin, New Demountable
ISOTTA	Lytle	10	4	2 2/5	3 9/10	H. T. Bosch	Multiple Disc	Selective, 3 Speeds	Shaft	49 in.	82 in	710 x 90 mm F. & R.	Michelin, New Demountable
LANCIA	Hilliard	12-18	4	3 1/2	4	H. T. Bosch	Multiple Disc	Selective, 4 Speeds	Shaft	52 in.	105 in	810 x 100mm. F. & R.	Continental, Demountable
S. P. O.	Juhasz	18-24	4	3 3/4	5 1/10	H. T. Bosch	Leather Cone	Selective, 3 Speeds	Shaft	.....	110 in.	32 x 4	Continental, Demountable

*Two cycle.

Requirements of the 1909 Racing Rules

By Rene M. Petard

Typical Picturesque Setting of a French Hill Climb, This Scene Being Located at Gaillon.

NOW that the racing rules for another year have been settled by the International Association of Recognized Automobile Clubs, as was lately reported in these columns, European designers will at once start work on their new racers, and, judging from the latest reports and rumors, quite a few newcomers in the field are to be expected. In order to give the American public and makers an insight of the question which the distance has always made rather remote, even to those most interested, consideration will be given in the following to tbe influence which the new rules will have on the design and construction of the 1909 racing cars, together with an occasional reference to European methods of race preparation.

As was before stated, a large number of entries is expected in next year's big road races. On the other hand, it is doubtful, altbougb the question was brought up, wbether a longer course than usual will be selected, at least for the Frencb race, so that there is every chance of a crowded race in which there will be a large amount of passing, necessitating cars of quick accelerating power, and this will be one of the most important points to be considered and one which will materially affect the design.

Effect of Reduced Engine Size.

It is not to be expected that the reduction In engine size included in tbe rules will bring about a closer resemblance between the racing and the touring cars. In fact, the effect will altogether be different, and an *eclosion* of high specialized machines, wbich the unaverted mind certainly would term as freakish, is to be witnessed. A forecast of what will happen can easily be drawn from the history of the English Four-Inch race, which was expected to be a touring car event and turned out to be the competition so far held in which the most unconventional machines were presented.

The influence of the minimum weight limit will be small, as, considering the type and size of the mechanisms which will be used, there is very little reason to believe that any maker will produce a car below 900 kilos; at the same time it will be well to keep as close to this limit as other conditions, especially adherence, will permit. It might not be untimely to state as regards this special question that foreign makers have pretty nearly abandoned the old notion that weight within reasonable limits was a hindrance to speed. In fact, not a few French makers openly admit that their unsuccesses in late years have been largely due to excessive power in proportion to weight. Inspection of past results will evidence the fact that the successful cars of the past two years were all on the rather heavy side, while the preceding successes of Brasier and Renault had been victories of relatively low-powered cars.

Strokes of Ten Inches May Be Seen.

Next year will be a long stroke year, as was 1908, or rather more than was this year. Strokes of ten inches will probably be seen; these, however, present constructional difficulties which will probably prevent their general adoption. The writer favors 200 millimeters or approximately eight inches. This will make an already quite high engine, although not sufficiently so to bring any noticeable perturbations in the stability of the machine in negotiating curves, such as were evident in the Voiturette Grand Prize, wbere the torque reaction of the very high single-cylinder engines created considerable driving difficulties around corners. It was found that engines with crankshafts turning left handedly were easier to manage in the numerous left-hand turns. Considering the fact that most races are run counterclockwise, with a predomination of left-hand turns, this sense of rotation should be recommended for racing engines.

To draw full advantage of the long stroke, and to give the engine the necessary flexibility on the crowded course, piston speeds much above normal will have to be resorted to, and the most successful motors certainly will keep up to 2,500 to 2,800 revolutions per minute without any appreciable drop in the power curve, which conservative estimates place above 130-horsepower.

To attain these results the greatest care will have to be exercised in the laying out of the valves and piping, and in the timing of the motor, witb consideration to the laws of gas flow and inertia. The valves in a hemispherical cylinder head, which were a majority this year, will next year be the rule, and they will preferably be set at 45 degrees angle, as in the Clement 1908 racer. The writer favors flat-seated valves in such an engine as having a better seat at high speeds and requiring considerably less lift for a given port area. The lift, however, should be sufficient to allow for more than the strictly necessary opening, as flat valves create more wire-drawing effect on gases than do cone-seated ones.

In the design of the valve proper the fillet should be very large, so as to guide the gas to the edge without the creation of eddy-currents, and the portion of the valve head bearing on the seat should not be left to protrude at a bigher level than the head proper, as is done in ordinary flat valve practice to facilitate grinding, as this sets up a resistance to gas flow at the very

point where it is most harmful. The valves themselves should be very light, as well as the reciprocating parts in their actuating mechanism to avoid inertia effects and insure strict obedience to cam profile. The inlet valve should be at least a full three inches diameter. The exhaust valve, if single, should be at least equal, although the above considerations of shape are of less importance for its design, but the writer would favor a smaller valve or an equal one with less lift and a well-designed valve closed exbaust port at bottom of stroke.

The exbaust valve should preferably seat direct on tbe cylinder head without the use of a cage to insure a cool and undistorted seat, which would otherwise be feared considering the diameter. This would increase complication and reduce accessibility, but the cbances of a machine are so utterly spoilt by a valve breakage that it cannot well be raised as an objection.

If a caged-in construction has to be resorted to, the writer will recommend that used on the motor which Nazarro drove with the well-known success at Brooklands. In this high rotary speed motor a single inlet and two exhausts were provided, all overhead. A fork-shaped rocker arm actuated the exhaust pair from a single actuating rod. This construction permitted to use exhaust valves of relatively small diameter, reducing the risk of pitting and of seat warping to reasonable limits, as was proved by the results achieved in the race, which was one of the hardest tests an engine ever was put to.

Regarding the Actuating Mechanism.

As regards tbe actuating mechanism, the overhead camshaft is most tempting, but it tends to further increase the height of an already abnormal engine, so that it seems preferable to leave this part in its more usual location in the crankcase. For the rocker arm construction the writer would favor the single beam, long ago inaugurated on the Fiat racers and used eon the Stoddard-Dayton stock cars, flat-leaf springs being used in preference to coil for valve return action.

The cam design should be such as to permit of rather wide clearance between rocker arm and valve stem, giving more sudden opening of valve. In the designing of the moving parts considerable care should be taken to so dispose the centers of gravity and of inertia of the beams, rods and fitments that a minmum effort be necessary to their motion at the highest speeds, and the necessary return springs should be fitted besides the valve springs proper to insure constant contact between the valve rods and the cams.

Timing Is Most Essential.

One of the main points in the successful design of such a high-speed engine is tbat of timing. Let it first be accepted that the recommended timing will be altogether different from that which would be adopted in an engine where anything like fuel efficiency was looked for. We simply want the maximum power at practically any cost.

Exhaust valve lead will be increased over current practice, 65 degrees before lower dead center not being exaggerated, although a suitable and large exhaust port in bottom of cylinder would permit advantageously to reduce this figure. If ports are well designed, lag of exhaust closing would not need be more than 10 to 15 degrees, this depending largely upon the length of the exhaust piping and its effect on the momentum of the outgoing charge. The lag at inlet opening should not exceed 20 degrees in order to give the cylinder the maximum of time to fill itself. The suitability of an overlapping action of the exhaust and inlet valves can only be decided upon when the piping is laid out. It works at its best with a long exhaust pipe and a short inlet, and the auxiliary exhaust port is unfavorable to it. The lag in closing the inlet also largely depends upon the piping design and the carbureter resistance to gas flow, but it should, in the writer's opinion, be around 15 to 20 degrees.

These conditions of timing and of speed are of considerable influence on compression, but it seems to the writer that considering past experience and the special requirements of the engine as to speed and flexibility, a safe compromise could be struck between 90 and 100 pounds cold. A compression relief through sliding camshaft would be useful for starting, but the writer will insist upon the undesirability of special exhaust cams for the use of engine as a brake, as was made on a few European racing cars. Such cams are higbly desirable on touring cars, but in a racing car their use brings sucb perturbations in tbe carbureter functions as to greatly reduce the rapidity with which the car picks up speed after their operation, making them more detrimental to higb average speeds on a difficult course than would be occasional misuse of the mechanical brakes.

Hints as to carbureter design are too special a proposition to be insisted upon here. It should, however, be mentioned that the throttle should be as close to tbe inlet valves as possible. In fact, the most successful French designer of racing cars always made his racing engines with twin cylinders and bad a separate throttle for each pair located within the casting directly under the valves, and this he considers of vital importance.

Castor Oil Lubrication Will Grow.

Lubrication will best be by the simple combination of splash with an overflow and a return pump to upper part of crankcase. Castor oil lubrication, inaugurated this year, will certainly generalize next season as favoring the enormous piston speeds aimed at. The cost of it is such that it will only be used in the very last days of practice and on the race days. Provision should, however, be made for it at the start through specially tight piston rings and of all means which will avoid its invasion of the combustion chamber, as it is of a most searcbing nature and is prone to leave more carbon deposits than the majority of other oils.

A successful departure from standard ignition practice which was used on some of the best cars of this year's races was the low-tension magnetic make and break, and it certainly will be more generally used next year. It will probably be used together with a well synchronized system of simultaneous ignition at two distant points in the cylinder head. This was used in the most remarkable engines of the small car race, where the unfavorable before-the-race theoretical comment which the move suggested was completely upset by results consisting in the obtention of 25 horsepower at 2,750 revolutions per minute out of a single 4-inch bore cylinder.

Althougb the writer favors a single casting for the four cylinders, in a moderate size engine he will suggest for the special case under consideration that the cylinders be cast separate with a skeleton water jacket around the head, and be finisbed inside and out with a common water jacket applied on the complete assembled unit, thus making a three-bearing crankshaft possible without undue span between the bearings and leading to a more compact and evenly cooled engine. To allow easy and rapid variations in speed, the crankshaft and the flywheel should be light, especially the latter, wbose influence is great in slowing down and restarting for passing and negotiating curves, which we have mentioned as an important point for coming races.

The crankshaft will be mounted on three large ball-bearings. To make high piston speeds possible, the reciprocating parts will have to be of the maximum lightness. Although pressed steel pistons have attained quite a preeminence abroad, they are not

Two Famous French Makers, MM. Renault and Brasier.

likely to be universally used, and the writer's personal experience is that, with a mild close-grained material, a cast-iron piston finished inside and out can be made fully as light as any steel construction, and present incomparable advantages as regards ease of running and security against seizing together with less abundant and easier lubrication. The connecting rod will be at least four times the crank throw, and preferably be cut from the solid in a roughly shaped hand forged alloy steel billet. The recommended section will be tubular, and very little material left at the ends, which simply will have to hold the bushings, the latter being relied upon to provide the necessary stiffness to distribute the load on the journals. The piston end bushing will preferably be cast iron of the same grade as selected for the piston itself, and will not require to be very thick; the big end will preferably be of the full marine type and soft babbit lined.

Not much need be said concerning the crankcase except that weight is gained and strength increased in these very high engines by carrying it quite high up the cylinder barrels, whose lower end is thus made very thin and acts merely as a liner to guide the piston.

A multiple disk or a Hele-Shaw clutch will answer the purpose very well, especially considering the fact that too large

Passing Through Town During British Four-Inch Race.

flywheels, even quite light, are not favorable to very high engine speeds, and, although steadier, are not desirable in the machine considered. But the writer would, nevertheless, favor a cork insert cone clutch, even if a powerful spring is required as more certain in results and less affected by variations in lubrication. Locking pins should be provided, as in the Brasier cars, and a dashpot fitted to prevent reckless usage of this dangerous part, as will sometimes be made by a most careful driver.

Thinks Chain Drive Is Preferable.

The car will obviously be chain driven. The percentage of chain-driven cars has steadily been increasing in European races and live axle victories have made themselves scarce. In a race run under engine limitation rules there is no room left for loss of power, and on account of considerably lesser unsuspended weight the chain gives a much better utilization and considerably reduces driving wheel slip.

The gear box and differential will be in a compact casing close to the rear axle, to reduce chain length, and will be joined to the clutch through a shaft and two full universal joints. The jackshaft will also be universally jointed to accommodate frame torsions, and the chain brackets will be stiffly braced on the cross member to which the rear of the gear box will be suspended. Four speeds should be provided, with direct drive on third and fourth, and the first and second should drive to the differential causing without returning to the primary shaft.

Concerning brakes, a set of internal expanding in the rear wheels and two pedal actuated contractings on sleeves extended from the differential casing are long established and satisfactory.

In respect to the running gear, high front wheels with narrow tires are conducive to easy running, and the adoption of similar front and rear wheels has no advantage of value to offset the advantage in speed derived from the construction mentioned in the foregoing.

Preference for the Detachable Wheel.

Although no decision has yet been arrived at by the ruling bodies concerning the wheel question, it appears that preference ought to be given the detachable wheel, if authorized, provided that the design of the rear hubs and sprockets is such that the drive be taken up as close to the rim as possible without undue strain on the spokes.

In the design of the car, considerable attention will have to be given to wind resistance. In respect to this it should be noted that slanting hoods and centrally located radiators are not of necessity desirable shapes, although they may be means toward the end. In fact, one of the best studied cars in this respect in 1908 was the Mors, and it had its radiator in ordinary touring car location and shape. The radiator is a necessary evil as long as the rules will be such as to remove all chances for air-cooled cars, if they are to ever have any. A well-designed honeycomb or flat naked tube radiator can be made with very little wind resistance, and of relatively small size, if the engine is properly designed, so that it can be left at its usual excellent place and the thinking be done on other parts of the machine. In the Mors case, the parts under the hood were all treated as if directly exposed in order to give the easiest possible flow to the inrushing air. The slant of the foot boards was carried to the height of the hood, and a large sheet aluminum plate fitted underneath to gradually deflect the air toward the ground to the rear, at the same time protecting the mechanism of the rear half of the machine. Externally the hood was conntinued by a sheet metal apron of other than haphazard shape coming close to the driver, protecting the occupants, save for the driver's head, and thus annihilating the considerable windage which they often are the cause of; the protection of the hood and dashboard being lost at the distance the seats are from the latter. Considerable attention should also be paid to the rear shapes on which the air closes. This is a matter of elementary boat engineering, and yet Serpollet and Brasier probably were the first to think of it, and that after the building of many cars, which, although most carefully studied in their forward shapes, did not show advantage over common construction.

Advantages Possessed by the Europeans.

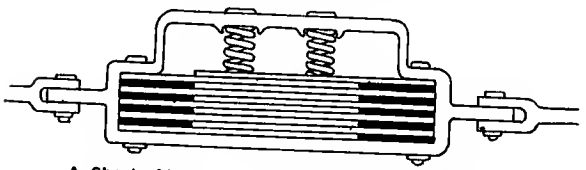
To close this study, a word will be said on what is claimed to be an advantage of the foreigner over the American, that of practicing. This does not exist to the extent believed on this side. The advantage of the foreign driver resides mostly in the experience the engineers, in the factory behind him, have of the racing problem, which is entirely different from that of making a good touring car, and also in the fact that the cars are generally ready months before the race. This, however, does not imply high speed practicing; the foreign driver tours with his car and gets sufficiently acquainted with it to feel "at home" behind the wheel. But the only real "test to destruction" takes place at the first race, and this explains the large quantity of mechanical troubles developing at the French race, which generally is the first of the season, in machines on which the drivers have had thousands of miles of so-called practicing without a hitch. It will be sufficient to mention the Fiat crankshafts and the Michelin detachable rims in the last French race, or the Hotchkiss axles in a previous instance, as striking examples.

That the American will have his word against the best foreigner, when the question will be handled with the same thoroughness here as it is abroad, is undubitable. The day should be close at hand, considering the impulse which the Locomobile victory and the creation of special roads should give to the question, and it is hoped that the foregoing consideration of one side of the problem will be of some help toward the end.

THE GENERAL UTILITY OF SHOCK ABSORBERS

By THOS. J. FAY, President Society of Automobile Engineers.

WERE springs perfect, with never a spring failure, accessories, known as "shock absorbers," would scarcely have a footing in connection with the automobile. Shock absorbers were originally devised in connection with railroad trains, in conjunction with the couplers connecting the cars, to enable the locomotive driver to start *one car at a time*. It is hardly necessary to point out the long train of cars could not be started by the engine were the couplings rigid, thus requiring *the simultaneous acceleration of the whole train of cars.*



A Shock Absorber of the Laminated Plate Type.

Couplers with a simple loss motion were tried in the early days, and, of course, the loss motion enabled the locomotive driver to take advantage of the same, with a view to starting one car at a time. It was soon found, however, that the cars were unable to stand the shock, and the spring bumpers, so called, came into vogue as a result. The spring bumper served very well for a good many years, but it always possessed the disadvantage of engendering oscillations, since it is true that the energy stored in a spring will be given up again, less the amount represented by the inefficiency of the process. To obviate this difficulty, laminated friction plates were placed in conjunction with the springs in such a way as to permit the springs to act, but the energy stored in the springs as a result of that action was dissipated by the friction of the laminated plates. In this combination will be found the source of the so-called shock absorbed as used in automobiles, and, as a matter of fact, its widest application to-day is in connection with railroad trains used to dissipate the energy of the coupler springs to kill the longitudinal oscillations.

In connection with the automobile, to consider the use of so much weight in the shock absorber system as will be found in the shock absorbers of railway cars would be out of the question, and since the weight of the shock absorbers must be something to take into account, *if they work*, while if they *fail to work* it is a crime to supply the requisite quantity of material for the purpose. There are two ways of solving this problem, the one of which is to use enough material for a direct application as they do in connection with railroad cars, the other of which is to apply pressure to a nest of circular discs or laminated plates, so connected with the lever system and linkages as to multiply the effect of that pressure for the purpose. Certainly the principle of lever advantage can be used to a very good purpose, and the fine examples of shock absorbers take this into account.

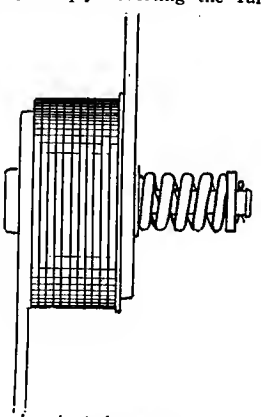
Friction Methods of Absorbing Shocks.

Shock absorbers of the friction type work both ways (as a rule), which means that the springs are snubbed both in action and in reaction. This is a matter that might be regarded as an advantage, excepting under certain conditions. As, for illustration, if a car in negotiating a series of depressions, happens to be of a wheelbase (considering the speed of travel) such as will set up a synchronizing periodicity, then it is plain that the friction type of shock absorber can prevent the springs from reacting within the period of time necessary to the process, with but one result, i.e., shock. This condition can be evaded by a chauffeur possessing enough skill to pilot an ox-cart, and it should be evaded, since, forsooth, one cannot tell what will happen to a car during the instant of spring failure.

There are shock absorbers of the class in which the dissipation of energy, by means of laminæ of plates or discs, does not take place. In this type of shock absorber springs or dash-pots are set to snub the reactive tendencies only. If springs, they may be of the helical type, working direct, or through a lever arm, and they may be simple or compound. A simple helical spring differs from a compound in that, in a simple spring the pull in pounds will be in direct proportion to the elongation or the compression, as the case may be; whereas, in a compound helical spring the pull in pounds increases disproportionately with the compression. The action of a spring so set is to limit the reaction of the spring suspension proper, the extent of which reaction in the absence of shock absorbers may be greater than the direct action of the springs, as is shown in the bumpometer record, Fig. 16. This reaction if not snubbed is probably the most potent factor for spring failures; the main leaves of the half elliptical springs in the absence of retainers are called upon to take the load under conditions of camber, indicating extreme fiber strains. The use of retainers modifies this individual action on the part of the main leaves, but the retainers do not serve as a cure for the evil, whereas the shock absorbers are specifically placed to limit the action, and if they are properly designed and suitably installed *they will serve the purpose.*

The Spring Checking of Rebounds.

There are several examples of springs in which the shock absorber feature is confined; in other words, the more ingenious of the spring makers are endeavoring to so design the springs proper as to eliminate the need for shock absorbers. The "Perfection Spring," as made by the Perfection Spring Company, of Cleveland, Ohio, is an example of what can be done by way of affording springs capable of resisting adequately in reaction as well as in action. Another scheme for accomplishing more or less the same purpose is effected by simply reverting the full eliptical springs at their ends, instead of using hinges. Retainers serve to a considerable extent for the same purpose, because they bring the short leaves into play in reaction, whereas without the retainers the main leaves would have to do all the work.

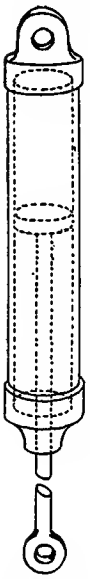


Laminated Disc Shock Absorber.

In recent times the idea of the cushion pneumatic spring has been developed to a certain state of perfection, and this spring will work just as well in reaction as it can work under the direct load. It seems to be satisfactory in truck work where it has been tried out, and a little experience along this line may indicate further successes. There is one other type of spring which is suitable for use in reaction, namely, the flat band coil (clock) spring. This product seems to be favorably considered by some autoists, and there is scarcely any reason why it should not do the work. Some experiments conducted in New Jersey last year, under the direction of Mr. J. M. Ellsworth, were with a view to ascertaining the extent to which shock absorbers would govern the action of springs and indicate the much desired level platform. The reaction involving a standard touring car of good characteristics as indicated on a bumpometer designed for the purpose, showed that the reaction from the normal static position was considerably more than the downward motion.

Some of the tests show that the reaction was 50 per cent. more

than normal downward motion from a static point, and repeated trials seemed to indicate that, with the shock absorbers, when properly adjusted, the reaction was kept within one-half of the normal downward motion, considering the normal static position at a base line. A common complaint made at that time was one that bad for its basis the lack of permanency of adjustment of the shock absorbers, they were capable of doing the work were they properly adjusted.



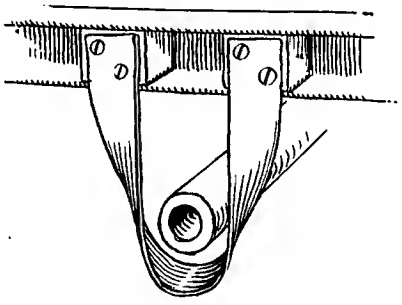
Dashpot Idea.

The makers of shock absorbers have evidently realized the arduousness of this service, because they have all redesigned along more rigid lines, and it is believed that this delicacy of adjustment is a condition of the past.

There is one other point having bearing on this phase of the question that should not be overlooked. If a car is so badly designed that the springs will not take care of the downward motion, it will be futile to expect the shock absorbers to take care of the reverse motion. Shock absorbers are not intended as supports for structurally weak springs or as cure-alls in cars of a high center of gravity, excess top hamper, short wheelbase and high speed. A spring maker will not be able to furnish springs to satisfy a condition such as this, and, as before stated, if the springs fail there is no chance whatever of the shock absorbers succeeding. These devices are auxiliary in their relation, and their success depends upon the success of the parts to which they relate.

Autoists are naturally curious to know which of the type of shock absorbers extant are the best suited to the occasions; they are prone to believe that there must be one best way. There never seems to be any one way that is better than a half-dozen others, unless all the conditions are previously fixed in view of that one way. The very fact that shock absorbers come as an afterthought would rather preclude the chance that they could have any fixed bearing upon the previous conditions as established upon the designs of cars. If cars are designed or constructed without taking the shock absorber question into account, then it is fair to assume that of the types of shock absorbers available that some one of them may be suitable to the occasion, all things considered.

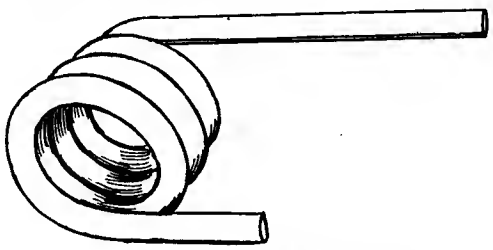
In the selection of shock absorbers for cars that are constructed independently of them, it becomes necessary to consider the car performance. If the springs proper are sufficiently supple initially, and will not permit the body to contact with the axle under severe conditions, thus limiting the performance to be corrected to excessive rebound; in such a car the reactive members might be limited to a gradual snubbing action above the static level. On the other hand, if there is an excessive vertical bounce and a series of oscillations, the shock absorbers might well be of the drag class, snubbing the action of the springs above and below the static level.



Scheme of Leather Limit Stop.

When cars are in the process of design, it is quite possible to eliminate the need of shock absorbers to the extent they are required in some examples of design. This is not to say that the shock absorbers could be eliminated, or that it would be desirable to eliminate them, any more than it would be a good idea to reduce automobiles to their simplest form. The fact that shock absorbers are used, and the further fact that they serve a useful purpose is no license to design cars so badly that even good shock absorbers would fail to can the oscillations.

Plea for Better Materials.—The success that has attended the shock absorber zone of activity is, despite the use of inferior materials in many cases and frightfully sloppy methods of applying the devices to cars. When the shock absorber interest more fully realized the terrific strains that shock absorbers fell heir to, they did move up, and they did correct more glaring faults with rather a good showing of promptness. On the whole, however, the material used in shock absorbers and the manner in which the materials were applied did not reach the high plane of automobile design for a long time. It was the lack of appreciation of the work shock absorbers had to do that retarded their progress to a marvelous extent, and it is because they have intrinsic value that they survived. There was a time when autoists preferred to wrap their springs with "Sampson" cord rather than be beguiled into fancied security by adopting shock absorbers that would not stay in place.



Simple Type of Spring Shock Absorber.

Fortunately, the situation developed a certain stability because of the underlying merit of the scheme, and the various types of shock absorbers are now to be had in much more stable form. It is not believed they have reached the limit of possible improvement, although they probably are on just as high a plane as any other branch of automobiling at the present time. There may be a little room for improvement by way of better spring materials, more permanent friction members and more secure blocking devices, but the latter part of this suggestion is open to the whole automobile, and not limited to shock absorbers.

The Influence on Cost of Maintenance.—If shock absorbers have the effect of leveling the platform and preventing oscillations, as well as rolling, it is equivalent to saying these same shock absorbers will materially reduce the cost of maintenance of the car. This is as plain as can be, because the life of a car on a hard level road is ever so much longer than the life of a car if the road inequalities are sufficient to engender shock conditions. It is the function of the shock absorbers to abort shock in that they snub the violent reactive tendencies that are due to the energy stored in the springs during the downward swing of the body. This energy stored in the springs must be dissipated by some device provided for the purpose, or it will be dissipated in the process of wearing out the elements of the car. Every violent motion imparted to the elements of the car construction is resisted at the terminals of the inter-relating members at the expense of high pressure, the inconsequence of which is that surface erosion must take place.

There is still another point of view involving the question of the kinetic ability of the materials used, as, for illustration, the dynamic life of any given material is much shortened if the material is subjected to violent shock loads. Distance rods, for instance, are stressed to double the static load, which in itself does not indicate the most serious factor, generally overlooked. In the first place the distance rods must be double weight, because the shock imparts double strain, but the life would be shortened even with twice as much material.

WINTER TROUBLES WITH COOLING WATER

YEAR after year, as Winter comes on, the question of the freezing of the cooling water is discussed anew. It is a serious matter and a feature in automobiling that will ever have to be dealt with, unless perchance oil or some other medium will ultimately be found to displace water, in Summer and Winter alike. A perfectly satisfactory cooling medium would have properties as follows:

(a) The specific heat would be that (or near) water;
(b) The specific gravity would be that (or near) water;
(c) The mobility would be nearly constant under all conditions of temperature;
(d) The solution would not support electrolysis;
(e) There would be no separating out of the components;
(f) Precipitation would not take place at any temperature;
(g) The boiling point would be that (or greater) of water;
(h) The solution would be neutral as respects its reaction;
(i) The rubber hose joints would not deteriorate in contact with the solution;

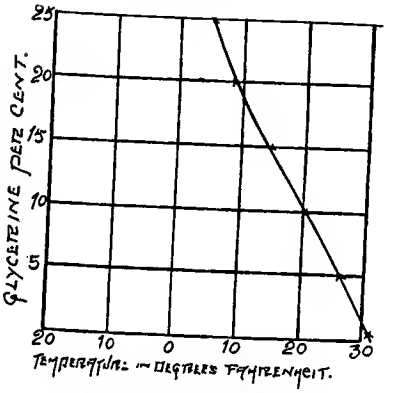


Fig. 1—Solutions of glycerine and water.

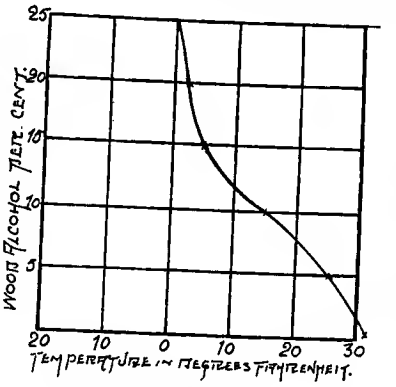


Fig. 2—Solutions of wood alcohol and water.

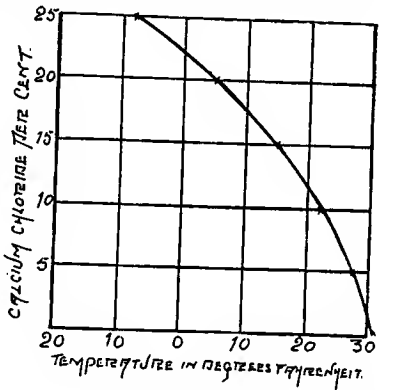


Fig. 3—Solutions of calcium chloride and water.

(j) The metals would not deteriorate in contact with the solution;
(k) Non-inflammable or nearly so.

Water answers all these requirements, excepting that its boiling point is a little lower than it ought to be for the best results. The best thermal efficiency of a motor will be when the jacket temperature is somewhat above the boiling point of water; there is not therefore quite sufficient margin, and the water is boiled off too easily.

Water is non-inflammable, and that is more than can be said for most oils. Light mineral oils, on the other hand, possess the high boiling point, so much to be desired, and the oil would therefore not waste away. Just how efficient this oil would be for the purpose is a matter that has not been settled conclusively, although some work has been done along this line and the author is using oil at the present time.

In the mean time it will be well to go over the whole matter the extent possible, in the light of present knowledge, rather with the hope of benefitting the many who come into the field with their first Winter's experience as yet in the embryo. Of the modia at present used, there is alcohol, glycerine and solutions of calcium chloride. Water is used with all of them, and in general, it is proper to say, the more water used the better if the solution will not freeze.

Solutions of Glycerine and Water.—These solutions work very well indeed, although it is true that the glycerine does attack the rubber hose joints, but not so rapidly as to become over troublesome. The chart, Fig. 1, gives the freezing points for the several mixtures of glycerine and water, and, as will be noted, no solution is considered above 25 per cent of glycerine (by weight), for the reason that, as before stated, the more nearly pure water is the solution the better, all things considered. It has been found that 25 per cent glycerine will serve in such weather as is experienced in New York. The author has used this solution and without any freezing trouble at all through three Winters. The solution will thicken up, but it will not solidify, and unless it does it will not disrupt the piping. The "slush" formation goes through a gear pump with apparent ease, and that is probably the most troublesome point in the circulation system.

If the system gets hot, it is water that boils off, and to replace the same is all that has to be done for, say, three months. After a time the solution looses all semblance of its original balance, and to start over again, with a new solution, is the wise course.

Solutions of Wood Alcohol and Water.—Wood alcohol differs from glycerine in one very essential particular in that it is the wood alcohol that boils off instead of the water. This is a misfortune, since wood alcohol answers every purpose in every other way. True, there are impurities in some grades of wood alcohol that under certain circumstances can do damage. With the low percentages, used in cooling and at the temperatures that prevail, it is not believed there is any danger from the use of this product in cooling work.

Fig. 2 gives the freezing point of solutions of water and wood alcohol, in which the alcohol is referred to in per cent, by weight. The balance of the solution is pure water (hydrant), and it will be understood the mixture will have to be adjusted at frequent intervals. The wood alcohol will soften the rubber hose joints, rather slowly, so that it differs only in degrees from the glycerine in this respect.

Wood Alcohol and Glycerine in Water.—Since either one of the ingredients added to water will lower the freezing point, it is a fair inference that they combined will do the same thing, each in its proportion to the water present—allowing that there is no chemical combinations—they being merely intimate mechanical mixtures. Assuming that the wood alcohol is to be preferred on some counts as less liable to choke up the constricted passageways, then it is well to consider the advisability of reducing the quantity of glycerine and substituting alcohol instead. It is very likely that by the use of both wood alcohol and glycerine, the total quantity of water can be increased, and this is a step in the right direction on two counts, *i.e.*, (a) cost and (b) stability.

With 10 per cent of glycerine in the water, the freezing point is 20 Fahrenheit. This leaves 90 parts of water, to which add alcohol, in amount equal to the glycerine added, plus excess alcohol solution to make up for water in the same—say, 10 per cent—and the effect of the alcohol present will be to lower the

temperature 13½ degrees Fahrenheit. The result will be a mixture, with a freezing point slightly below zero, with improvements in other ways besides. This solution then would consist of 10 per cent glycerine and 11 per cent of wood alcohol, in which 10 per cent water will be found. The balance to be water.

This solution would still serve fairly if through lack of attention all the alcohol were to escape. The glycerine, then, would be as a safety medium and might be of great advantage on that account. On the other hand, to be rid of over half the usual amount of glycerine used is a positive advantage.

Solutions of Calcium Chloride and Water.—Of this material and its uses but little has been said, excepting that it should be chemically pure. Its performance in the cooling system of automobile motors has not been commented upon at any great length, and experience is wanted. Even if it is chemically pure, this is not to say there will be absolutely no electrolytic action. To what extent these salts will precipitate is a matter that should receive some consideration. The average "thermo-syphon" system is ripe for precipitation of the salts of metals suspended in water. The reason for this lies in the fact that the precipitation takes place at certain temperatures below the boiling point of water, and it is the thermo-syphon system that affords strata of water at several levels of temperature. In the thermo-syphon system the water is steaming where it contacts with the hottest zones around the combustion chamber, and the rather sluggish movement of water tends to support precipitation.

The efficiency of the phenomenon called emissivity will be low, if the surfaces are coated with a crust of any kind, as salts of metals. Sodium chloride has not been proposed for the purpose, although it will lower the freezing point of water almost as well as calcium chloride. As a matter of fact, 15 per cent of sodium chloride (common salt) gives a temperature of freezing of 12.2 degrees Fahrenheit, whereas the same percentage of calcium chloride affords a freezing temperature of 15 degrees Fahrenheit. Beyond this degree of concentration the calcium has the most marked effect, but it is positively a hazard to use a more concentrated solution.

Common salt is cheap; that is one thing in its favor. Electrolytic action would follow its use, but this is true of all such (metallic) salts. It would not be possible to eliminate the action by using chemically pure salts, for in battery work the salts are chemically pure, the object being to eliminate other than desired electrolytic phenomena.

Radiators are costly, delicate and composite in construction—that is to say, there are a plurality of metals in the makeup of radiators, hence electrolytic action would follow, due to the difference of potential natural to different metals immersed in a saline bath. Fig. 3 shows the freezing point of calcium chloride, of the several degrees of concentration up to a saturated solution. It must be remembered that the saturated solution is ascertained at 60 degrees Fahrenheit, and increasing the temperature increases the capacity of the water to hold in suspension the salts. Any approach to the saturation limit then is attended by danger of precipitation. On the other hand, the Ohmic resistance of solution is lowest at about half saturation. In the long run it is experience that counts, and it is still a question as to the extent to which saline solutions can be used with safety. No autoist cares to do the experimenting if his radiator is to be the "dog to try it on." There is no other point against saline solutions, especially common salt. Cast iron undergoes a change in its structure when it is immersed in salt water. The castings seem to rot. The rot is to a great depth and is different from oxidation. Sea water has the same effect, and in sea water the salts are diverse, including sodium and calcium.

From what has been said there would seem to be no solution so good as water, but unfortunately water will expand when it freezes, and it will freeze, on small provocation in a radiator. The efficiency of this device is a guarantee that the necessary heat exchange will take place, with a small difference in temperature below 32 degrees Fahrenheit.

Oil as a Cooling Medium.—Of this liquid for purposes of cooling there are points in its favor that renders it even more efficient than water. In the first instance, oil has a higher boiling point—about double—than water, and as a result the oil will not waste away.

The heat exchange takes place at a higher temperature, and the thermal efficiency of the motor will therefore be higher. The cooling system can be with less surface, hence lighter, and the work of the fan is of less importance. As a general proposition, oil will absorb heat in the ratio of 10 to 7, as compared with water, and too with half the drop in temperature, which is at a saving of cooler surface. On the other hand, the oil works at a higher heat level, which is the secret of the better heat exchange for a given radiator surface.

Of course, very soft solder for the joints of radiators might melt out were oil used, should the heat balance take place at a fairly high level of the temperature. Solder can be so soft as to melt in boiling water. Thus no radiator should be held together by solder with a low fusing temperature for, aside from the above consideration, the strength of the joint will be lower for the solder of the low fusing point.

In a given radiator the temperature of the heat balance depends (a) upon the efficiency of the radiating surface, and (b) upon the extent of that surface. Radiators differ as much as 100 per cent, as respects efficiency of the surface, and in cases in which water boils off alarmingly it is always a good possibility that the oil will work without giving trouble of any sort, if indeed the power of the motor is not actually increased.

Air cooled motors are efficient in the use of fuel, because the heat abstracted through the cylinder walls is low, in comparison with the heat "sponged" off the surfaces by cooling water. The air cooled motors, on the other hand, have unequal temperature zones. Oil cooling stands as a happy medium in that the inequalities are leveled, and the adjacent zones are of a common temperature—(a) lower than in air cooled motors, (b) at a higher heat level than in water cooled motors.

With oil, the circulating pump should be of greater capacity than it is in some examples of pumps to be seen on cars. On the other hand, "leakage" with oil is lower than with water. The oil packs the pumps. One more point: The oil kills pump noise and profusely lubricates the pump, and, again, should there be a small jacket leak to the cylinder, it would not be of such great consequence, although a leak of any moment would cause excess pressure and "spouting" in the cooling system.

The Quality of Oil to Use.—This is a matter that can only be put in abstract terms. Oil is subject to a great variety of substitutions, and reliance must be placed in the refiners. Any refiner who will study the conditions and fairly meet them will be justly rewarded. The oil should have properties as follows:

(a) A constant mobility under the several conditions of temperature;
(b) The minimum body;
(c) The highest possible specific heat;
(d) The highest possible boiling point;
(e) The highest possible flash point;
(f) No acid reaction whatsoever;
(g) Fair lubricating properties;
(h) A stable chemical state of equilibrium, under the conditions of service.
(i) Absence of rosin or gum of any sort;
(j) Free from jelly formation;
(k) Low priced.

Of the oils to be had it would seem as if a light, thin, pure mineral oil would be the most reliable, in most, if not all respects. Animal fats become rancid under certain conditions and acid in time. Vegetable oils are prone to the same tendencies. Fish oil would be worth trying, merely as an experiment.

In any case the "overflow" pipe from the cooler should not lead to a point adjacent to lamps, or any other source of flame, for, should the oil reach its boiling point, the vapor would ignite readily and this is something to avoid. To be sure, oil is now used extensively in automobiles, and it does not add to the fire

hazard perceptibly when compared with gasoline which is handled with great safety. At all events, it will be well to stick to water rather tban to take all the brands of oil tbat can be bad upon paying tbe price. The "oil man" has oil to burn, but the man with an automobile can scarcely afford to add fuel to the flame.

Some Basic Considerations.—A little further light on the question will tend to put oil before the mind's eye as a good future possibility. It was said oil will permit of the heat balance at a bigher level than that possible with water. Taking this as a basis, it is to show that, for a given "wetted" surface of cooler, the heat exchange will increase because of the difference in temperature as follows:

$$W = \frac{1}{223} FtA = \text{Emissively in watts.}$$

W = emissively in watts;
F = increase in temperature in degrees Fahrenheit;
t = number of water cycles per minute;
A = area of wetted surface in square inches.

If it is assumed that tbe loss to the cooler must equal about 50 per cent of the value of the fuel, while the useful work equals 16 per cent, then for a 16-horsepower motor the loss to jackets will be 50 horsepower. With water for cooling, the value of

F = 100 degrees in round numbers, taking a hot summer's day for it and assuming that thc temperature should remain stable at about 200 degrees Fahrenheit.

Transposing the formula, we have:

$$A = \frac{223W}{F\,t} = \frac{223 \times 37{,}300}{100 \times 60} = 1393.7$$

$W = 50 \times 746 = 37{,}300$.

t = number of times heat is sponged off by water, per minute: say 60.

The area of a cooler with oil, if the temperature of exchange would be 200 degrees above the surrounding instead of 100, as with water, would be:

$$A = \frac{223W}{F\,t} = \frac{223 \times 37{,}300}{200 \times 60} = 693.1$$

In other words one-half the surface, if double the temperature, is taken. These relations are independent of the efficiency of the surface; any surface that would do for water, and perform in a fitting manner, would be reduced one-half were the working difference in temperature doubled.

There is a common notion that motors have to work at low temperatures. This notion is fitted to the wrong detail. It is the water that has to be kept from boiling. The limit, excluding water, is preignition. The weight efficiency of a motor will fall off if the heat is beyond a certain point, but this same efficiency is not as high, with water, as it would be with some cooling medium that would not abstract so much of the fuel value from the cylinder walls. As a matter of fact, there is a fallacy in the formula due to this influence, but, in the absence of data, it is better to abandon the fallacy, since the error is on tbe safe side.

If preignition sets in it is a sign of excess compression, low speed, or light flywheel. These matters can be corrected. If oil will equalize the temperature adequately, and accomplish the task at a bigher thermal level, provided the weight efficiency will approach the maximum in tbe process, the adoption of oil will be as one of the distinct advances in automobile work. In the meantime the inexperienced autoist will be wise to look as high as the universal joint in his neck will allow, provided he keeps his feet on the ground. A man that cannot afford to ruin an automobile will do well to let oil experiments come down the line, to be adopted by the makers of automobiles first, or to be worked out by auto enthusiasts who can afford to take tbe risk. There are many pitfalls to be encountered, mainly because oil (the name) covers a multitude of sins.

THE ABSTRACT ABILITY OF KEYS FOR SHAFTS

LET,

D = diameter of a shaft in inches;
B = breadth of key in inches;
L = length of key in inches;
T = twisting moment in inch-pounds;
S_1 = working stress of shaft in pounds;
S_2 = working stress of key in pounds per square inch.

Then,
$$T = \frac{\pi D^3 S_1}{16}$$

EXAMPLE:

Let,
$$D = 1.25;\ B = .25;\ L = 2;$$
$$S_1 = 16{,}000;\ S_2 = 16{,}000.$$

Then,
$$T = \frac{3.1416 \times 1.95 \times 16{,}000}{16} = 6130$$

If the key is from the axis a distance equal to

$$Y = \frac{D}{2} \qquad \text{Then } T = B\,L\,S_2\,Y.$$

That the strength of the key should equal that of the shaft is assured, hence:

$$\frac{\pi D^3 S_1}{16} = \frac{B\,L\,S_2\,D}{2}$$

and,
$$\pi D^3 S_1 = 8\,B\,L\,S_2.$$

Therefore:
$$L = \frac{\pi D^3 S_1}{8\,B\,S_2}$$

Exploiting the example further we have:

$$T = B\,L\,S_2\,Y = .25 \times 2 \times 16{,}000 \times \frac{1.25}{2} = 5000.$$

Thus showing that the shaft is stronger than the key in the ratio of 6,130 to 5,000. This would not indicate harmony.

It was said:

$$L = \frac{\pi D^3 S_1}{8\,B\,S_2} = \frac{3.1416 \times 1.25^2 \times 16{,}000}{8 \times .25 \times 16{,}000} = 2.419$$

Thus, we find the key should be nearly 2.5 inches long, to be equal in strength to the shaft, but, should it be impossible to lengthen the key, as in a gear case, for instance, in which no more than 2 inches can be allowed, then the remedy lies in a compromise, if a reduction in the value of T can be considered. The compromise would come by way of increasing the breadth of the key.

If a compromise is not permissible, the diameter of the shaft must be increased enough to swell the value of T adequately.

If the key and the shaft are not of equally good materials, the values taken for S_1 and S_2 must reflect the difference. If the hub that is keyed on is of different material, again, an allowance must be accordingly made.

If two keys are fitted (usually at 90 deg.), it is best to assume that only one of them will have to do the entire work; it is not easily possible in practice to fit two keys alike. The key that fits the best must do all the work, until it deforms enough to allow the other key to go to work. If the "scab" (second) key is not a fair fit tbere is no safety in having it there. Anyway, the shaft is weakened and harmony cannot reside in a two-key job.

In automobile work, hubs are invariably so short as to require close figuring when keys are considered. It is not uncommon to find lost motion in timing gears, due to short keys on small-diameter shafts. Even flywheels are with lost motion betimes, and when this is noticed it is high time to look for a repair shop.

LETTERS INTERESTING AND INSTRUCTIVE

HOW TO CALCULATE DIMENSIONS OF GEARS.

Editor THE AUTOMOBILE:

[1,638.]—I should appreciate very much if your correspondence department could give me information of any simple rule or formula which you have for figuring the size of cams and required diameter of timer gears and half timer gears; also commutatore and timer gears for four-cylinder four-cycle motore. What horsepower should a motor of four-cylinders four-cycles 1¼ hy 1½ develop? A SUBSCRIBER.

Berkeley, Cal.

There is no simple rule that you will be able to use to give you a constant gas velocity through the influence due to changing the contour of cams. Most internal combustion motors disregard the question of a constant gas velocity. The lift of the valves should be about 8 millimeters (25.4 millimeters equal one inch); having fixed upon the lifts of the valves, you have established the maximum eccentricity of the cams. You have not established the interval of time the valves should stay open. This phase of the question could not be discussed sufficiently in limited space, but fortunately THE AUTOMOBILE (issued Nov. 5, 1908, page 639) discussed this matter at great length.

How to calculate the dimensions of gears for the half-time shaft is very completely dealt with in the catalogues of the Brown & Sharp Co., Providence, R. I. It will be impossible to do the subject the same justice in the space here afforded. In relation to the power that you might expect from a four-cylinder motor, 1¼ times 1½ inches, bore and stroke, respectively, it is only possible to give an arithmetical value which according to the A.L.A.M. would be as follows:

$$\text{H.P.} = \frac{1.25^2 \times 4}{2.5} = 2.5 \text{ nearly}$$

This is on the assumption that the piston speed will be 1,000 feet per minute. Since your stroke is 1½ inches the crankshaft speed for 1,000 feet per minute piston speed, would have to be 4,000 revolutions per minute; this is higher than anything any one has yet had the pleasure of witnessing. Should the crankshaft speed have to be lowered to, say, 3,000 revolutions per minute, the power would then be about three-fourths of that given in the formula, with a better chance of actually realizing the same because the gas velocity would be more nearly in accord with accomplished facts.

SPLIT PORCELAIN TUBES IN SPARK PLUGS.

Editor THE AUTOMOBILE:

[1,639.]—I recently changed my spark coil on an old model car, substituting a modern high-priced coil instead. I expected to be out of all ignition troubles as a result, but find that the porcelain tubes on the spark plugs fail rather too frequently. Could you tell me why? P. H. D.

New York.

The time was when this difficulty could be traced to inferior porcelain or to the means of "taking up." In other words, the porcelain tubes were pinched and cracked as consequences. On other occasions the defect was due to unequal expansion, and between the several causes, some one of which seemed to be present rather too frequently, autoists were ever wont to complain, and justly, since the tubes are fragile enough at best, without resorting to unequal pressure due to an ill fit. The main point, however, is to call attention to a new trouble due to the higher efficiency of spark coils as they may now be had. In the first place, the old sources of trouble are almost, if not quite, eliminated, and the new one will be avoided under proper conditions.

Modern spark coils will spark across a considerable gap, but as the gap increases, so does the strain on the porcelain tubes. This "electrostatic" strain will become enough to disrupt the tubes in some cases, if the electrodes are spread apart as much as they may be ere the spark dies out. Care should be exercised not to go the limit in this respect.

SPELTER IS USED FOR BRAZING CAST IRON.

Editor THE AUTOMOBILE:

[1,640.]—Can you give me through "Letters Interesting and Instructive," the formula for the compound ueed in the brazing of cast iron. A SUBSCRIBER.

Boetonia, Cal.

In the regular brazing process, which can be used to braze cast iron, "spelter" is employed.

TWO AND THREE-PORT MOTORS.

Editor THE AUTOMOBILE:

[1,641.]—Please explain the principles and construction of the "three-port" motor. G. P. AMES.

Brooklyn, N. Y.

In the two-port motor, as illustrated in Figure 1, the functions are as follows:

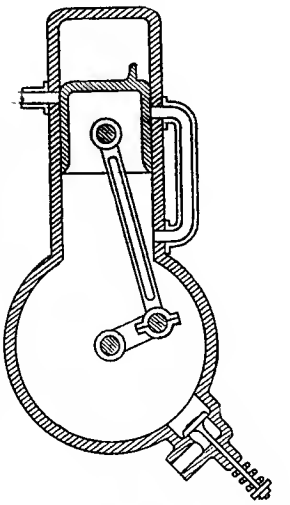


Fig. 1—Two-port motor.

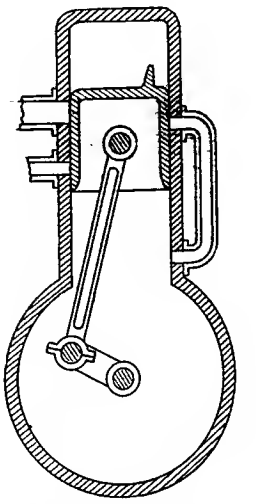


Fig. 2—Three-port motor.

The first stroke of the piston produces a vacuum in the crankcase and tbe mixture rusbes in (as a consequence) through the check valve in the motor case. The second stroke compresses the mixture, and when the communicating port is uncovered the mixture surges into the cylinder. The next (third) stroke compresses the mixture entrapped in the cylinder, since the ports are then covered by the piston, and at the proper instant the mixture is ignited.

From this point on it is a normal repetition of functions, and once the motor gets under way it two cycles. The three-port example differs in that the mixture is taken in through a third port uncovered by the piston instead of through a check valve in the case, and the details in practice change accordingly. Tbe drawings show the difference so clearly as to demand no further discussion.

THE UTILITY OF THE OFFSET CRANKSHAFT.

Editor THE AUTOMOBILE:

[1,642.]—In talking to automobile salesmen the descriptions of their products more frequently than not include a reference to offset crankshaft. Can you briefly state the advantages derived?

New York. M. B.

The practice of offsetting the crankshaft in automobile motors is rapidly gaining converts, and there are numerous examples of offsetting to be seen at the present time. In this scheme, it will be remembered, the crankshaft is not set in the plane of the middle of the cylinders. In other words, the crankshaft is

set slightly to one side. The exact amount of this offset seems to be a variable with different designers, but the object is always the same. When the piston is in the position of maximum compression involving the ignition and flame propagation, it is the idea to have the connecting rod in the vertical position. The force of the explosion will then come on the connecting rod endwise and the piston will not be pressed unduly against the cylinder walls.

THE TREND IN MODERN SPRING PRACTICES.

Editor THE AUTOMOBILE:

[1,643.]—I am curioue to know why it is that epring troubles are so prevalent in some care and entirely abeent in others. It cannot be alwaye a question of the quality of materiai, becauee I have eeen epring breakagee repeatedly with varying gradee of materiais on a given car. What are the other influencee aeide from the quaiity of material that ehould receive consideration? L. L. D.
New York.

The old practice of fixing a uniform curvature of the spring leaves frequently leads to breakages due to distortions set up at the spring perch. This tendency is now aborted by making the spring leaves in such a way that the curvature begins at points beyond the spring perch, so that the clamps when they are pulled into tight relation do not straighten out the plates. It is still the custom to use a leather pad on which to rest the springs because thereby the coefficient of friction becomes that of leather, and creeping tendencies are as a consequence remote. There is also the question of the camber given to the respective spring plates. If the plates are all of the same thickness, they should all be curved to the same radius, for then the extreme fiber strain would be equal in all the plates for every alteration in camber incidental to the service they are placed to perform.

MORE FOR THE MAN FROM DULUTH.

Editor THE AUTOMOBILE:

[1,644.]—In answer to query No. 1,601, will say that I believe the party will find the unaccountable knock, when ascending hills on the high epeed, to be in hie torsion rod, it having jarred looee and needs to be tightened. Have had the eame trouble myself, and, after quite a lot of looking around, I located it. BOX 826.
Aurora, Mo.

Editor THE AUTOMOBILE:

[1,645.]—In letter No. 1,601, October 27 ieeue, I notice that a friend from Duluth is having trouble when pulling up grade on high gear. I think that he will find that hie trouble is backfire caueed by what ie called static eiectricity. For a remedy, first separate all battery leade and ground by 1-inch space, fastening same with wood or some non-conducting fastenere; and if this does not remedy the trouble try interchanging the unit coils in the spark coil caee. Sometimee the latter ie all that ie necessary.

In short, it eometimes happens that the leads or epark coils become "shorted" by this static or iatent electricity and cause a backfire when the mixture is just right. I hope that if our friend from Duiuth bas faith eufficient to try the remedy here suggested he will aleo report through your vaiuable columns what measure of eucceee he has. A MINNESOTA SUBSCRIBER.
Owatonna, Minn.

"HUMBLE CHAUFFEUR" ANSWERS "SOREHEAD."

Editor THE AUTOMOBILE:

[1,646.]—I am tempted to send thie reply to the right honorable Mr. Sorehead, L. D. F., Auburn, N. Y.:

"Gracious Patron of Chauffeurs:

"Your deiightfui biiiet doux ie just received, and I hasten to acknowledge the pieasure and inspiration it affords me. The gentiemanly expreseion of your amiabie attitude iooeens my hand from the wheei and iifts me out of the right front eeat to lofty heights of eerene beatitude. Hence

Where the motors cease from throbbing
And employers are the beet;
Where the carbureters clog not,
And the chauffeurs are at reet;
Where the reetless, reckless road-kings
Are meek and reverent,
And induige not in expietivee,
Nor to their epieen give vent;
Where there is no cuehion greasing,
And the iampe do never break,
Where the License is iegitimate
Without a poker etake;
Where the 'Choeen' really care for
And operate the car,
Politeiy waive their ealary
To epare Sorehead a jar;
Where there are no paper coiiare,
Where there ie no 'Forty per,'
Where ths garage smeiis like roees,
Mingied with eweet ecented myrrh;
Where the inner tube ie cheriehed,
And there is no 'eoda-hop,'—
Aii are college cuitured chauffeure
And empioyere are tip-top,—
The chosen all are iinguiete
Of profound ability,
They bow and ecrape and paiaver,
With killing courteey;
Where owners havs no 'heli-sticke'
To grudge to 'firemen,'
Where evii iooking gobiine
Ne'er stupid eeem again;
Where the gasoline fraternity
Ne'er bump into a dray,
Nor wreck a nervous eyetem
Nor honk along the way.
No prieon etripee are prayed for
By pioue Sorehead jaye
Who pen-paint with a master hand
The chauffeurs' beastly ways.

"But I am brought back to commonpiace existence with a thud. I vociferousiy long to upiift the Employers' profeseion, but modestly hesitate to suggest poesibie ways and means of improvement in their morale and mannere because I am your

"Sterling, Ill. "HUMBLE CHAUFFEUR."

THE AUTOMOBILE CALENDAR

AMERICAN.

Shows and Meetings.

Dec. 31-Jan. 7..—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reeves, General Manager, 29 West 42d St.

Jan. 5.....—New York City, Fourth Annual Meeting Society of Automobile Engineers. (Will adjourn until January 19 after opening eeeeion.)

Jan. 18-23.....—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers.. M. L. Downs, Secretary, 7 West 42d St., New York City.

Feb. 6-13.....—Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. S. A. Miles, Manager, 7 East 42d St., New York.

Feb. 15-20.....—St. Louis, Mo., Annual Show, St. Louis Dealers and Manufacturing Aeeociation.

Feb. 15-20.....—Detroit, Wayne Pavilion, Automobile Show.

Mar. 6-13.....—Boston, Mechanics' Building, Seventh Annual Automobile Show, Boston Automobile Dealers. Chester I. Campbell, Manager, 5 Park Square.

Mar. 27-Apr. 3..—Pittsburg, Duquesne Garden, Automobile Show, Pittsburg Automobile Dealers' Association.

Races, Hill-Climbs, Etc.

Nov. 26.....—Savannah, Ga., Grand Prize Race, Savannah Automobile Club and Automobile Club of America.

Jan. 1-2.....—Philadelphia, Two-day New Year's Run of the Quaker City Motor Club.

FOREIGN.

Shows.

Nov. 28-Dec. 13.—Paris, Eleventh Annual Salon de l'Automobile, Grand Palais, Automobile Club of France (Pleasure Vehicles, etc.)

Dec. 20-28.....—London, Stanley Show, Agricultural Hall.

Dec. 22-29.....—Paris, Eleventh Annual Salon de l'Automobile. (Commercial Vehicles, etc.)

Jan. 16-25.....—Brueeele, Show Organized by Belgian Chamber Syndicate, Palais de Cinquantenaire.

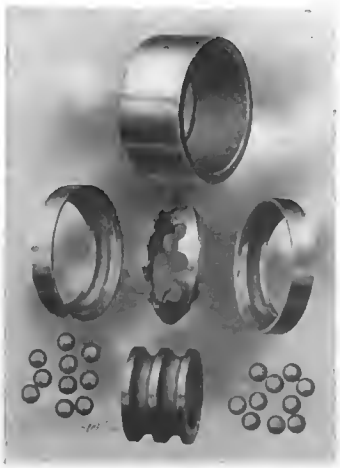
NEW DEPARTURE TWO-IN-ONE BALL-BEARING.

There are few places on the automobile where improvement has not been brought about by the substitution of an anti-friction type of bearing for the plain types formerly employed, but there are likewise few places on a car where the problem has not been complicated to greater or less extent by the fact that both thrust as well as radial loads have had to be carried. The front wheel hubs, for instance, where the thrust load not only frequently equals the radial pressure on the bearing, but sometimes exceeds it. The bevel gear drive, differential, and gear-set also afford instances where the requirements call for a bearing capable of sustaining a thrust load that is often practically the equivalent of its radial carrying capacity. The New Departure Manufacturing Company, Bristol, Conn., has been devoting its efforts to the development of a ball-bearing that would be capable of not only sustaining equal thrust and radial loads, but which would be capable of bearing greater loads for its size, and the result has taken the form of the New Departure "two-in-one" annular ball-bearing. which first made its appearance on the market early in the year.

Assembled Bearing Complete.

Sectional View of Bearing.

While especially adapted to automobile use, owing to its dual ability as expressed by its title, it has also been designed for general use and has already found numerous applications in special machinery and for power transmission. Its value in automobile work would arise from its ability to withstand radial or thrust loads, or any combination of the two, with the use of but a single bearing with its attendant simplicity of mounting. In order to bring about this result, two rows of balls are employed in staggered relation to one another, and the ball races are so arranged that the line of pressure is either at an angle of 45 degrees or 60 degrees with the horizontal, when the axis of rotation of the bearing is in a horizontal plane. The makers claim this has been accomplished without departing from that simplicity which characterizes the usual type, and that is evident from the fact that exclusive of the balls there are but five parts to the complete bearing, and when the latter is assembled these are permanently combined, making the bearing self-contained.



The Various Separate Parts.

These parts, in the order of their assembly from the shaft outward, are the cone, the separator, the two cups and the shell, the order in which they are named being illustrated by the cut showing the dismounted bearing, while their relative positions are shown in the cross-sectional view of the bearing. From this it will be evident that the line of pressure of the cone, cups, and balls makes an angle of 45 degrees with the horizontal, something which is equally true of both rows of balls, this feature adapting the bearing to withstand a load from any angle, while the additional row of balls is said to increase its capacity one and one-half times. Two semi-circular races are turned in the cone to receive the balls, while the sheet steel separator is so stamped that the ball retaining notches are staggered with reference to each other. These openings are made slightly larger than the ball diameter, so that the contact between the ball and separator is said to be a point contact at one end of the axis of rotation, while the weight by separator is carried on the balls at the top of the bearing. By maintaining the relative positions of the balls at all times, cross friction is claimed to be entirely eliminated, while the friction introduced by the use of the separator is practically a negligible quantity. One of the most radical departures in the construction of this bearing is its permanent assembly, sufficient metal being provided in the shell to permit of drawing the latter tightly over the cups; this, the makers claim, absolutely maintains the relationship of every part of the bearing. And they are so perfectly confident of the status of every bearing that leaves their works that this is an advantage in many ways. A large range of sizes is now being manufactured, for which standard dimensions of bore and outside diameter have been adopted.

LICENSED STATUS OF THE E-M-F SETTLED.

Ever since the formation of the Everitt-Metzger-Flanders Company, of Detroit, there has been more or less confusion regarding the status of the Northern Motor Car Company, as well as of the relation of the new company to the licensed association. The Northern Manufacturing Company joined the A. L. A. M., April, 1903, later changing its title by amendment to its charter to that given above, and this corporation sought permission to assign its license under the Selden patent, which carries with it membership in the Licensed Association, to the new E-M-F Company. This permission has just been granted, and the transfer includes all the business of the Northern company. While this winds up the existence of the latter as a factor in the automobile industry, former purchasers of Northern cars will be cared for by the new company.

When seen at the Association headquarters, Mr. Metzger said that the formal transfer of the property had been completed, and the work of organizing the factory forces of the new company was so well advanced that he felt confident the 10,000 cars the company had planned for would be completed in time for delivery during the coming season.

The officers of the E-M-F Company are: President, Byron Everitt; general manager, Walter E. Flanders; treasurer, Charles Palms; secretary and general sales manager, William E. Metzger.

SHAWMUT PLANT SUCCUMBS TO FLAMES.

Boston, Nov. 13.—The plant of the Shawmut Motor Company in the suburban town of Stoneham was destroyed by a fire which started in the factory building early this morning. It was discovered by the night watchman, but so rapidly did the flames spread over the oil-soaked floors that the combined efforts of the local fire department and companies from the surrounding places of Winchester, Wakefield, Melrose, and Woburn, could not stop its headway, and besides burning the Shawmut plant it consumed three tenement houses and narrowly missed a church. In the factory were ten finished cars and others in process.

Points of the New CADILLAC "30"

THE 1909 undertaking of the Cadillac Company of Detroit, Mich., will prove of especial interest to the many Cadillac adherents, and undoubtedly will swell that pronounced contingent as well. The Cadillac company, in view of its great experience, consistent practices, and sane policies, is well qualified to meet the demands of 1909. The Cadillac "30" is a commodious touring car of conventional design, seating five passengers with ample room, has a wide side entrance, rich upholstery, and a display of taste in the finish. Easy riding is due to adequate springs and a harmonious relation of power and weight, and the distribution of the same. The road performance will be that due to a 106-inch wheelbase, standard tread, 32-inch wheels, with 3½-inch pneumatic tires and adequate power.

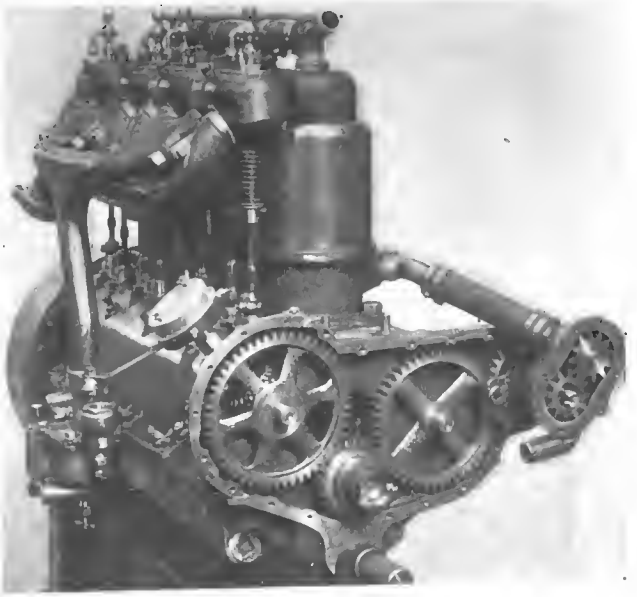
Some Features of the Motor.—Rated by the company at 30-horsepower, with cylinders 4-inch bore and a stroke of 4½ inches; cylinders and pistons of fine gray cast-iron from the Cadillac foundry. The water jackets are of copper, securely placed, and the valve details are usual to the Cadillac products. The crankshaft of chrome (alloy) steel is supported on five good adjustable bearings, is balanced, and runs in true centers. This same crankshaft is so nicely designed and fashioned as to enormously enhance the value of the motor in question.

The connecting rods are of die forged special steel, nicely shaped, and balanced with pistons to afford a true kinetic balance of the reciprocating parts insofar as such a condition is possible. The crankshaft is offset to relieve the pistons of undue pressure, and the valves (inlet and exhaust on one side) are interchangeable, of liberal size, and the valve gear (tappets, etc.) are up to the usual Cadillac standard, including hardened steel cams. The crankcase of aluminum is of rigid construction, due to the scientific design, with walls thick enough to abort noise. The half-time gears are of ample proportion, and are noiseless, since they are set to run on the pitch line, and are profusely lubricated.

Motor Accessories.—The water circulation is vigorous, due to the working of a gear pump. The cooler is of liberal size, attractive appearance, and is made of vertical copper tubes, passing through closely pitched horizontal copper plates. The fan is of liberal size, and placed just back of the radiator, under the hood.

Fuel System.—Includes a Cadillac float feed carbureter of well and favorably known characteristics, healthy piping and a commodious copper gasoline tank. The lubrication system on the Cadillac "30" is especially noteworthy. It is a continuation of the well-known Cadillac system, including a double-acting force pump and an oil pan in the crankcase, with an oil reservoir alongside the motor. The oil from the reservoir is pumped through the "sights" to the places demanding lubrication, which includes maintaining the level in the motor case oil pan, from which the distribution is by "splash" of an improved form.

Ignition System.—The magneto system comes as an extra and the regular system is by jump spark, storage battery, and auxiliary dry cells. The quadruple coil is located on the dash, and is appropriately finished. The muffler is rather more ambitious than custom dictates, in that it not only serves to subdue the noise, but it is provided with a cut-out that serves as a "safety" as well. Moreover, the exhaust may be directed to a whistle and a footwarmer at the will of the autoist.



The Motor of the 1909 Cadillac "Thirty."

Transmission Gear Set.—The primary transmission is by means of a clutch of suitable design, thence through the main shaft to a selective type gear set. Three speeds and reverse are provided, and the gears, shafts and high duty parts are of right design, using chrome nickel steel. The gears, etc., are heat treated, and the accuracy of finish assures duplication of parts. The shafts and spindles rotate on annular type ball bearings, and the work as a whole shows the earmarks of quality. The sliding is through a nicely designed side lever, on the right, while a foot pedal operates the clutch.

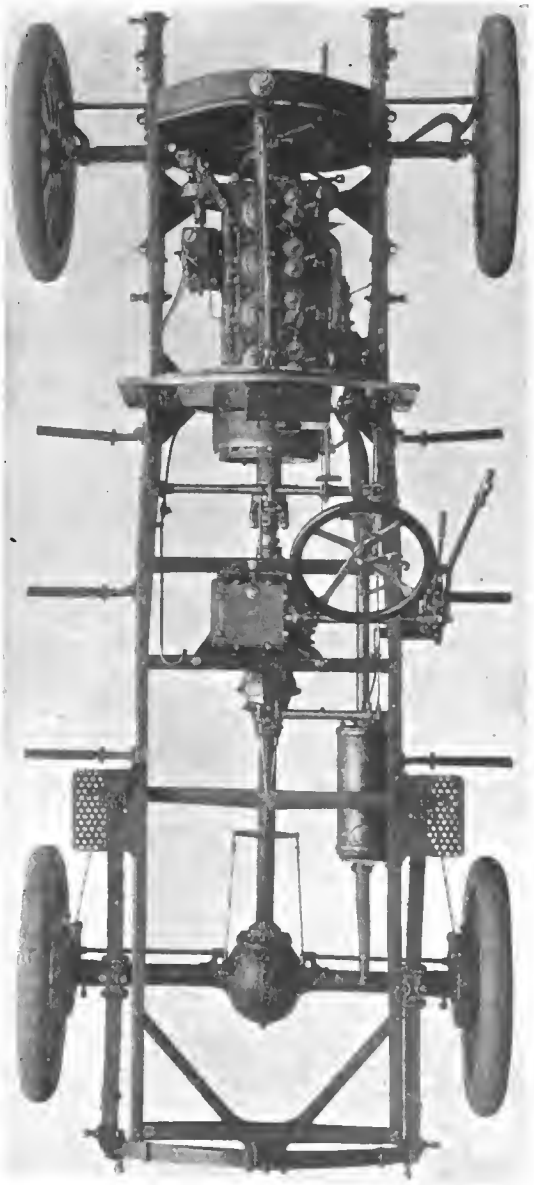
Pertinent Chassis Features.—Channel section side frames and laterals of

the same material are secured in a neat and substantial manner. The frames are of the "drop" type, with an eye to ground clearance; the offset is to 30 inches in front from 33 inches at the back.

Spring Suspension.—This is of the platform type at the rear and half elliptical fronts. Ball joint sbackles are used; spring perches are rigid, but the rear perches are free to oscillate, hence the springs are free to perform their functions. The live rear axle housing is of cold drawn seamless steel, witb a good ground clearance under the differential. Annular ball and Hyatt roller bearings are used, and the wheels are pressed into tapers at ends of the sbafts. From the transmission gear set to the rear axle the propeller shaft is provided with universal joints in oil tight housings, and rolls on annular type ball bearings. The front axle is also a seamless cold drawn tube with drop forged steel sockets electrically welded to place. The wheels, artillery type, are of selected second growth hickory of appropriate design, with substantial steel bubs, front and rear, accommodating 32 x 3½-inch tires. The front wheels rotate on two-point ball bearings, with ¾-inch balls inside and 9/16-inch balls outside. The cones are tool steel.

Braking System.—Two pairs of powerful double acting bands engage on drums attached to the respective rear wheels. The brakes are compensating, of good diameter and wide face. One set is internal expanding while the other is external constricting. The facings are camel's hair fabric. The control of the brakes is by means of a foot lever for the service brakes, working the constricting bands, while the emergency brakes are of the expanding order, also by a foot lever. Means are provided for take-ups and adjustment at all points.

Steering System and Control.—The mechanism is of the worm and worm gear type, fitted with two ball thrust bearings, and with especial care not only to eliminate lost motion but to keep it out. The linkages are of strong design, good appearance, and with ample bearing surfaces. The spark and throttle levers are conveniently situated upon the steering post.



The Cadillac's Neatly Proportioned Chassis.

Some Pronounced Cadillac Tendencies.—Particular attention is called to the facilities afforded in the Cadillac establishment for turning out accurate parts, thus assuring ease of replacement in due course of time. Tbe cursory examination of an automobile might lead to the conclusion on the part of the uninitiated that a replacement is a perfectly simple matter in relation to which there should be no trouble at all. They overlook the fact that there are from 800 to 1,000 diffcrent kinds of pieces in a well designed car, and possibly 50 per cent. more of such units involved in an inferior design. There is no way under the sun by which a car can be assembled without using a sledge hammer, a file, and "cuss" words, unless the interrelating members are ground to a finish witbin limits of "tolerance" well below a thousandth of an inch.

A visit to the Cadillac plant will disclose complete sets of the finest instruments of precision and a testing equipment sufficiently commodious to enable them to make a running test on every automobile shipped, even in tbe hurry season, when the pressure for deliveries is most felt. The Cadillac Company makes no secret of their splendid facilities along these lines, nor are the conditions enumerated merely new to them, hence a novelty to be heralded from the housetops. As pioneers in automobile work, with a considerable previous practice along lines involving the manufacture of machinery, they were in a position to realize the necessity for check methods in the shop, and means for arriving at the true state of affairs without waiting for disagreeable returns from their patrons.

Fortunately a large number of automobiles cannot be built in a haphazard way, if they are intended to run for any length of time at all without hesitating at the brow of every hill. The haphazard method of doing things does not of course involve quality.

There is one other point made by the Cadillac Company that should be of interest to their patrons, *i.e.* the shop system was especially devised with the idea of accomplishing the respective tasks within a pre-scbeduled time. It was not the purpose to try to do things within less time than they naturally would take, for that would end in a slight to quality, but it was with the intention of arranging the start at the propitious moment. Deliveries may therefore be expected with a precision not to be outdone.

Standard Finish of All Styles.—The standard color is royal blue, including body, hood, frame, axles and wheels, with light blue striping. The fenders and radiator are baked black enamel. The dash is highly finished mahogany with brass edges. The door strip and hood sills are also mahogany. The seats are luxuriously upholstered in full hides of hand buffed black leather, tufted over deep coil springs and fine quality genuine curled hair. The car will be made in three styles, touring car, roadster, and demi-tonneau. Price is $1,400, f.o.b. Detroit, including three oil lamps and horn.

Headquarters of the Taximotor Company, of Boston, in the Motor Mart, Park Square, and Its Equipment of Thomas Taxicabs.

HUB UNEXPECTEDLY IS CAPTURED BY THE SWIFT TAXICAB

BOSTON, Nov. 16.—"But Boston is so very different. You can't compare it with other cities, and particularly with New York. What would go down there wouldn't take with us at all, and people don't want taxicabs." So said the many wiseacres who thought they knew what the staid population of the Hub was hankering after in the shape of urban transportation, and they would have none of the new innovation. Mind you, these were the men who had been making a living out of Boston's needs for going to the theater, shopping, and the hundred and one other uses to which the cruising hack is put for time out of mind, but they could not see the taxicab at all. And that was only last July.

What has happened to their theories and their cocksure opinions about what the population of the country's center of culture in the few months intervening may best be illustrated by the photograph recently taken of the morning line-up for inspection at the headquarters of the Taximotor Company, which has extensive offices and shops on the Church street side of the Motor Mart. It shows no less than 40 of the handy little Thomas taxis, comprising the entire fleet attached to the Boston concern at present, but the number will not long remain at this figure if Manager W. P. Barnhart's appeals to the Buffalo factory for more have any effect, for by "more" Mr. Barnhart means 20 additional cabs, or an increase of 50 per cent. at a lick.

Old-time livery stable keepers may have thought that Boston's population did not want to thrust the equine and his two-wheeled chariot out of their affections in the unfeeling manner that has actually taken place, but the developments of the past quarter tell a very different tale indeed. And it is not the result of any change of heart on the part of these self-constituted authorities, but is due wholly to the push and hustle of the E. R. Thomas Company in showing the old-timers that the open season for competition between gasoline and horseflesh was on in earnest and that the people of Boston wanted taxicabs just as much as did the cab riders of other American cities, whether the men who had collections of worn-out two-wheelers and "chemical" four-legged motors that they were averse to relegating to the scrap heap and the farm, willed it or not. Persuasion and common sense business arguments availing nothing, the Thomas company gathered its forces and lit on the cab business of the Hub. It organized the Taximotor Company, which was duly incorporated with W. P. Barnhart as manager, and A. Z. Mitchell, of the Thomas home office, as treasurer and secretary, and opened up shop in the Motor Mart with a few cabs.

The start was actually made on July 18 last when 20 of the Thomas cabs first reached there and were put in service, so that Boston's appreciation of the improvement they represent over former methods of transportation may be readily gauged by their increase in the interim. But it has not been all plain sailing by any means—quite the contrary, in fact; so that much of the result accomplished in that very short space of time must be credited to the energy with which the problem has been attacked right from the start. As an example of the uphill nature of the task, the innovators found confronting them may be mentioned the obstructive tactics of the police, the commissioners being very much averse to granting licenses to the drivers *at all* at first, on the highly enlightened ground that the presence of these vehicles on the streets would have a tendency *to obstruct traffic* in the crowded portions of the city. And this from the omniscient center of thought! The italics are the writer's, but they fail to equal the occasion. Naturally, established interests in the same field did not hesitate to add the weight of their influence in retarding as much as possible the introduction of the motor-driven cab, but it was a foregone conclusion right from the very outset that the Bostonese were quite as much in a hurry to get there with increased comfort at the same expense for traveling as were the inhabitants of some less enlightened centers of population that might be mentioned.

But despite drawbacks of every nature, opposition, police discrimination, impossibly green drivers and the hundred and one kinks that have to be straightened out in the course of establishing any new innovation firmly on its feet, the taxicab has taken the Hub bodily. This is shown by the fact that the cars of the Thomas fleet make an average of $20 a day, and business is so good that many more could be put into service at the same remunerative rate.

INTERESTING KINKS IN FRANKLIN CONSTRUCTION

By CHARLES B. HAYWARD.

SYRACUSE, N. Y., Nov. 16.—Whether it be due to the fact that the average publicity man is not mechanically inclined, or, on the other hand, has more than enough to do with his own particular worries, certain it is that be seldom gets beneath the surface in sending out information regarding the cars his company is making. He tells the specifications of new models in stereotyped form, and expatiates on the improvements made in comparison with the particular form of design or construction that previously characterized the car, but he rarely tells what the car is made of, or how it is made, except by the trite phrases "Of the very best materials," and "By the highest skilled labor," which have accordingly come to mean about as much as the "Havana" cigar, and other incidents of daily life, the truth of which goes unquestioned merely through long asserted repetition.

Much to Be Seen in the Franklin Factory.

Thus it is that a tour of inspection through one of the large factories devoted to tbe manufacture of automobiles is a matter of considerable interest, and the home of the Franklin cars at Syracuse, owing to the numerous features whicb distinguish them, offers more than the usual reward as a compensation for the time spent. There are several matters of prime importance in the construction of any car that might well be made more of in publicity announcements, such as the thorough testing out to which the entire transmission of the Franklin cars—tbe gear-set, propeller shaft and rear-axle driving unit—are subjected to in connection witb a hydraulic brake, before being mounted on tbe chassis, but it is naturally the little things that strike the initiated eye more forcibly.

One of these is the practice adopted by Designer Wilkinson of sbrinking a steel band on tbe periphery of the flywheel, thus enabling a light wheel of large diameter to be employed with perfect safety in connection witb a high-speed motor. This in itself is a very small thing, but it forms a striking illustration of the painstaking attention to detail that is manifest in every part, beside being an indication of the fact that expense is not spared to attain lightness.

Probably notbing strikes tbe experienced visitor quite as strongly as the multitude of operations necessary to tbe completion of the Franklin wood frame, when compared with the small amount of bandling that the now practically universal pressed steel frame calls for before it becomes a component part of the car. And, unlike the latter, this handling begins long before the raw material reacbes the factory at all, for in order to be absolutely certain of its supplies the Franklin Company buys the timber standing and seasons the ash strips at its own plant. Ash has been selected as the most suitable material, not alone owing to its strengtb and lightness, but likewise for its great resiliency. Instead of using a single piece for the side members, flaws are absolutely guarded against by the laminated construction adopted, the pieces being glued and screwed together througbout their length while the joints are protected by facing strips top and bottom, and aluminum end pieces.

Franklin Frame Construction Speaks for Itself.

What the Franklin frame is capable of withstanding has probably never been more strikingly illustrated than was the case when it survived the shock of meeting a stone wall at 40 miles an hour on one of the record-breaking transcontinental trips, and its durability is even better vouched for by the report current among Syracuse garages that a greater number of pressed steel frames receive the kindly attentions of the Franklin repair department in the course of a single season than have ever been known to default in the case of the laminated ash frame during the entire period that this construction has been in use, which means since the Franklin has been on the market.

Franklin and air-cooling are inseparably associated and not a few of the interesting operations to be seen in no other plant of the kind bave to do with tbe motor. The latter, with its dome-shaped head and combustion chamber, concentric valves and auxiliary exbaust, is absolutely *sui generis* in the world of automobile motors, but its features are too well known to call for further description. An item of interest in connection with its construction is to be found in the manner of shrinking the stamped steel cooling fins on the cylinder castings, these light flanges being made too small to pass over the cylinder when cold. Tbey are expanded by immersion in a bath of tar or asphaltum, maintained at a temperature in excess of that reached by the motor in operation, and then readily slip over the casting. The arrangement of flanges on each cylinder varies according to its location on the crankcase, the first cylinder naturally requiring less cooling than any of the others; the second needing slightly more than the first, and the fourth more than any of the otbers, tbe amount of surface presented by the flanges reaching its maximum in the case of the latter, as the effects of convection are least in the case of this cylinder, owing to the fact that the air is already heated before reacbing it; this arrangement is similarly carried out on the six.

Die-cast main bearings constitute another feature of interest on the Franklin, particularly as the Franklin company was responsible for the development of this particular process and made use of it for otber commercial applications before undertaking tbe manufacture of automobiles. With its aid, bearings that do not vary a thousandth of an inch are obtainable, thus doing away with the laborious and costly hand-fitting necessary in assembling the ordinary poured bearing and making it possible for a Franklin owner to obtain an absolutely interchangeable duplicate of a bearing for his car at any time.

Resilient Wood Saves Many a Jar.

The underhung arrangement of the full elliptic springs is anotber Franklin feature that has been consistently adhered to and which accounts in large measure for the easy riding of the car, although the designer does not attribute this exceedingly desirable characteristic to the feature of suspension alone, for wbile it is essential to absorb as much of the shock as possible, and nothing is quite equal to tbe full elliptic spring in this respect, it is quite as important to deaden what does get past the springs, and for this purpose nothing is in the same class with a resilient piece of wood. As one of the Franklin engineers inquired, "Did you ever try to break a rock with a steel-handled sledge hammer?" Hence this added function of the wood frame which could hardly be more appropriately explained than by the foregoing query, as anyone who has ever tried the expedient mentioned has no desire to repeat it.

Whether it be in the macbine tool departments, the assembly floor, motor tcsting rooms, or the capacious body building shops, there are numerous operations, the manner of carrying out which is apt to hold the observant eye longer than necessary to give the casual glance and nod of assent to the guide's statement usually accorded the general run of routine work. And in noting that many things are done differently, when mental comparison is made of the results of more or less recent visits to other shops, with what is now passing in review, the conclusion is forced home that many things are likewise done better. As is the case with old established makers, the builders of the Franklin turn out a very large proportion of all the finished parts that enter into the construction of the car, and nothing is left undone to make each component as perfect as is possible with the best facilities obtainable for the work. The plant is several stories high and spreads over a considerable space of ground, an addition providing many thousand square feet of floor space having been just completed, this having been found necessary to handle the increased output.

Cross-Country the Aeroplane now Travels

By W. F. Bradley

Henry Farman En Route on His First Cross-country Aeroplane Trip.

PARIS, Nov. 10.—Flying has entered upon a new era, the era of journeys from town to town, and from point to point. It is Henry Farman, the first European to cover a circular kilometer, who has established a unique record by a flight from Châlons-sur-Marne to the old cathedral town of Rheims, separated by 17 miles, covered in 20 minutes.

Since returning from New York the Anglo-French aeronaut has not been seen much in the neighborhood of Paris. He had sworn never to fly again at Issy-les-Moulineaux, the ground on which he won the $10,000 prize last January for a kilometer flight, and had been busy searching for a more suitable training ground further afield. Châlons-sur-Marne, to the east of Paris, was selected, and it is here that several flights, none of them of very great importance, have been made during the past six weeks.

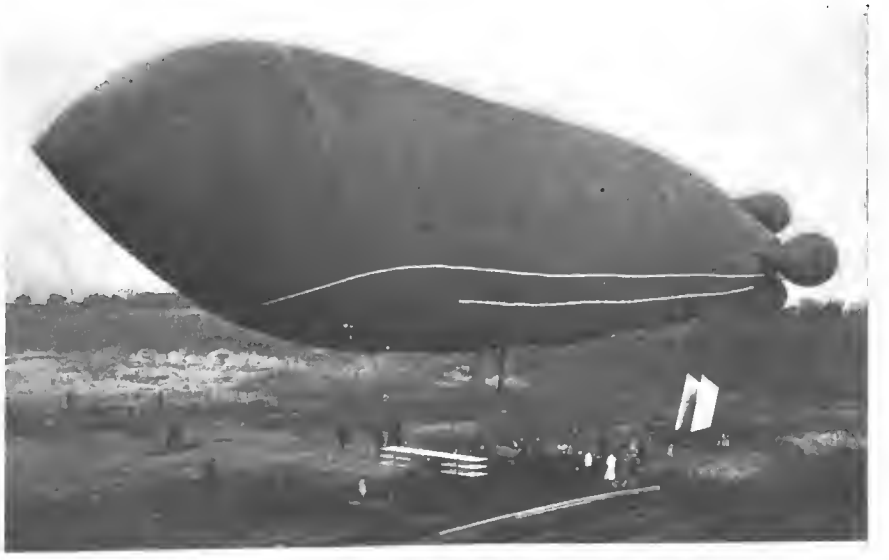
On a recent Saturday afternoon more careful preparation than usual was made, but although there was enough gasoline on board to make a flight of three hours, it was not generally known that the machine would pass out of the limits of the flat military ground. On the first swing of the propeller the engine started; a second later the assistants had released hold, and Farman and his aeroplane were soaring aloft to a height that appeared unnecessarily high. A few seconds' maneuvering, as if seeking his bearings, and the pilot was off in a straight line for Rheims, the cathedral of which could be clearly seen from the steering wheel of the artificial bird 200 feet above the ground.

"He's going across country," yelled the small crowd, and immediately there was a rush for the cranking handles of the automobiles, a banging of doors and a rattle of changing gears. The country being absolutely flat, it was possible to follow, watch the flying machine pass over the railroad, rise considerably higher, and fly over the small forest of the Grandes-Loges. The passage of the Marne Canal stopped the pursuing automobiles for a few seconds, and Farman disappeared from view. But a few minutes later he was seen again, now passing over the village of Petites-Loges, leaving the church steeples of Verzy and Verzenay on his right, now flying over Beaumont, now over the river, sailing above St. Leonard, and finally settling down near the Pommery wine establishment on the outskirts of Rheims.

"Yes, those first few minutes up aloft, with unlimited space before me, were rather exciting," declared Henry Farman when questioned about his flight. "Even before I had cleared the flat military ground the question cropped up, 'What will happen when I get above those tall poplar trees over there at Mourmelon?' A touch of the elevation rudder and the machine had risen still higher. Nevertheless, it was impossible not to feel anxious as I soared over the forest of waving green, and to ask again and again 'Am I high enough to clear?'

"You say that I was 250 feet high? Well, it is doubtless true, but I never realized it, for all the time I had the impression of being very near the tree tops. But when the forest was passed there was another difficulty in the mill and the village of Mourmelon. I watched the wind closely, for above these high trees there are eddies and currents which tend to draw you down, while over the open spaces there are air currents which cause you to rise higher. But the machine never faltered. It was a severe nervous strain, watching the wind and paying attention to the steering, while at the same time listening with all one's might for a 'miss' in the motor. But despite this it was the finest moment of my life to soar above my fellow men, to pass above the fussy railroad engine spitting out fire and smoke, to look down at the automobiles raising their cloud of dust on the white highway, to soar free and unfettered in the pure heavens."

The distance in a straight line from the Chalons camp to the outskirts of the city of Rheims is 17 miles, which, having been



Clement Dirigible Airship Containing Most Powerful Aerial Motor Yet Built.

covered in a fraction under 20 minutes, gives an average speed of ahout 51 miles an hour for Farman on his record trip. The rate of travel is faster than that generally maintained hy Wilbur Wright, but is slower than the average speed of Bleriot, the chief of the monoplane school. The comparison, however, is not altogether a fair one, for the monoplane is hy its nature a much faster type of machine than the hiplane as used by Farman, Wright and Delagrange.

Farman's first flight was made a little more than a year ago—Octoher 26, 1907—when he covered 770 meters at Issy-les-Moulineaux and won the Archdeacon cup. On January 13 of the present year he covered a kilometer in a closed circuit and became entitled to the Deutsch-Archdeacon prize. On March 21 he made a European record of 2,004 meters in 3 minutes 31 seconds. As the Wright brothers were not then generally helieved in, this was claimed as a world's record. The next important flight was on July 6, when Farman remained aloft 20 minutes 19 seconds, winning a prize of $2,000 offered by M. Armengaud for not less than 15 minutes in the air. Demonstrations in Belgium and near New York, none of which developed any remarkahle performances, occupied the rest of the summer, and it was only a few weeks ago that Farman settled down to serious work at Chalons.

Bleriot's Extended Flight Startles the Peasants at Work in the Fields.

Farman's winning of the height prize, which took place near Chalons 24 hours after the cross-country run, was a very tame affair. A line of balloons was stretched 82 feet from the ground, and the aeronaut told to fly over it. On the first attempt Farman cleared with 10 or 12 feet to spare, settled down to the cheers of the crowd and was the possessor of a cash prize of $500.

Bleriot Next Made Cross-Country Flight.

PARIS, Nov. 11.—Right on the heels—or should it he the wings?—of Farman, Louis Bleriot has attempted and accomplished a cross-country journey. Bleriot's flight loses much of its éclat by reason of it heing attempted 24 hours after that of Farman, and also because two stops were necessary hefore the trip was finished. Bleriot, who had been training on the B[illegible]uce Plains for several days, principally with a view to winning the height prize, resolved, when he heard of Farman's record. to do something equally as good. His machine was smashed, for during the afternoon he had attempted a flight with the guide ropes of the elevation rudder crossed, with the consequence that when he wanted to come down he went up, and when he wanted to rise he descended. At one moment the monoplane stood almost on end, and when the pilot finally realized what had happened be came down with such a run that a few of the rihs of his machine were broken. Mechanics worked all night fixing things up, and next day all seemed favorahle for a free soar.

Bleriot mapped out his course; from his field at Toury, near Chartres, he was to reach Artenay, swing round some captive balloons placed there to guide him, and regain his starting point, making a total distance of 20 miles. The outward journey was made without difficulty, but at such a high speed—the estimate is 65 miles an hour—that the pursuing automohiles were left behind, and for a short time the aeroplane was completely lost to view. When found, Bleriot was in a field, verifying his magneto, which had suddenly developed symptoms of irregularity. An hour and a half later all was right again, and without any outside help the flying machine rose into the air and continued its interrupted trip. Before the starting point was reached again there was another stop, of a few seconds only, in order to verify the working of the engine. Again Bleriot was able to get away without outside help, and at 5 o'clock fluttered down at the door of his shed, so satisfied with his first free trip that he declared he would never again be content to circle round and round a field.

The two cross-country flights, one with a biplane, the other with a monoplane type of machine, have sent France delirious with joy. Though Farman owes allegiance to the British crown, he has lived so long in France that he is claimed as a native, and the two performances are looked upon as a national victory which will lower the prestige of Wilbur Wright. The natives have hegun to take courage and to remark that after all they are as good flyers as the American. More thoughtful followers of the sport point out that if Wright is not willing to hreak away from his regular routine at Le Mans he runs the risk of finding himself deserted in the middle of France, for there is much more interest in a free flight across country than in the most wonderful work over a chosen ground. Douhtless Wilhur Wirght will not he sorry if this does happen, for he has never sought crowds.

Over $221,000 Offered in Aeronautic Prizes.

PARIS, Nov. 12.—Over $221,000 in cash prizes is offered by various European bodies for competition among pilots of flying machines of the heavier-than-air type. The list is headed by the $50,000 prize of the *Daily Mail* for a flight from London to Manchester, a journey that is not likely to he attempted during the ncxt twelve months. Michelin's annual prize of $4,000 will he awarded to Wilhur Wright at the end of this year, if the present long distance record is not heaten in the meantime. The flight from Paris to Clermont Ferrand, also proposed by the tire manufacturer, is not likely to be attempted during 1909. The Grand Prix of the Aero Cluh of France and the $20,000 offered by the Monaco Sporting Cluh will hoth be won before the cnd of the coming year.

The sum of $2,500 will doubtless be won during the next six months hy a flight over the 20 miles of water separating France from England, and a further sum of $5,000 awaits the first pilot to carry Commandant Renard across the English Channel on either an aeroplane or a dirigihle halloon. There are $2,400 for the aeroplanist who will risk a flight across the city of Paris.

Finally Came Presentation of the

AT one stage of the proceedings attendant upon the final festivities in connection with the Vanderbilt Cup race of 1908, the famous artistic silver trophy shared the same reposing table with the plutocratic gold cup of the 1908 Grand Prize race at Savannah, scheduled for Thanksgiving Day.

The incident came last Thursday night at the West Fifty-fourth street home of the Automobile Club of America, to which came a thousand and a few more to see the formal presentation of the Vanderbilt Cup to the proper officials of the Locomobile Company of America and to honor the maker and the designer, and the driver and his mechanic. The invitations were issued by the Cup Commission in behalf of the Locomobile Company, which was the host of the occasion.

The function being in the A. C. A. clubhouse, it was an expected courtesy that President E. H. Gary should be the first speaker introduced by Russell A. Field, who pleasingly filled the post of master of ceremonies. Judge Gary congratulated the Cup Commission on the conduct of the race, the maker and designer upon the production of the winning car, and the driver and mechanic who were so instrumental in securing victory. "Give Americans a little longer to prepare, and they will always occupy first place," said President Gary.

William McAdoo, a former police commissioner of New York City, was the succeeding speaker, and he supplied some excellent advice, which told the autoist that when the road was clear he could utilize his speed, but recklessness should be curbed and the rights of other highway users should be recognized.

Then came the presentation of the cup by Jefferson deMont Thompson, chairman of the Cup Commission, who formally turned the trophy over to S. T. Davis, Jr., president of the Locomobile Company. Among other things he said:

"This in an American year. We have won the athletic championship of the world, and we have won the classic trophy, to capture which in years gone by France, Germany, and Italy have spent a million dollars. It has at last fallen to the lot of an American manufacturer, an American designer, and a driver with American blood in his veins to win it."

In accepting the trophy S. T. Davis, Jr., said that the winning of the cup had been the crowning achievement of three years of effort. The offering of the cup was due to the patriotism of William K. Vanderbilt, Jr., and his rules were responsible for the fine material and workmanship required of cup aspirants. Mr. Davis outlined the efforts of his company to win the cup, and gave all the credit to Mr. Riker.

There were loud calls for Designer Riker, who modestly declared that he had had little to do with the success of the car, which was due to the material and the skill of the workmen.

Winthrop E. Scarritt, a former president of the A. C. A. and also of the A. A. A., supplied one of his ebullient orations.

George Robertson, the pilot of the winning car, was a retiring hero, and accompanying him was John J. Hayes, winner of the Olympic Marathon race, the two 1908 international winners receiving the heartiest of receptions.

A. R. Pardington, the man responsible for prevailing upon Mr. Vanderbilt to offer the cup, told of the difficulties of the first races. Mr. Pardington declared that the parkway will be so far completed next year that both the Vanderbilt and Grand Prize races can be run over it exclusively.

Moving pictures of automobile events here and abroad were followed by a supper and a general jollification. Of course, there was racing talk and ideas of all kinds.

Among the notables in the throng were the following: J. A. Kingman, Joseph Tracy, Percy Owen, S. A. Miles, H. M. Swetland, Alfred Reeves, C. R. Mabley, Harry Fosdick, L. R. Perlman, W. D. Gash, Frank Eveland, Charles E. Miller, Alexander Dow, Peter Fogarty, A. W. Church, Harry Miller, Joseph Jones, Dr. J. N. Lanehart, chief surgeon of the race; Major C. J. Crowley, of the Irish Brigade; H. F. Donaldson, Rene Petard, J. J. Lannin, of the Garden City Hotel; H. F. Mollenhauer, J. J. Mann, of Paris; F. E. Moscovics, J. J. Woodward.

Popular Type of Garage with Well-Lighted Floors.

Minneapolis, Minn.—Deals have been closed for property on Hennepin avenue on which two of the largest garages in the country will be erected. The Maxwell-Briscoe company has plans under way to erect at Hennepin avenue and Ninth street a two-story building with basement fitted out in the most complete manner. Last week the Pence Automobile Company purchased the corner property at Hennepin and Eighth street. Work will be commenced at once on a six-story building with basement in which they propose to have facilities for doing all kinds of repair work. The building will have a heating and lighting plant in the basement, where power will also be generated for use in the shops.

Madison, Wis.—The Hokanson Automobile Company have started work on their new $12,000 garage, which they hope will be ready for occupancy by December 1. The structure will have a ground floor 77 feet by 132 feet, in the rear a second story for the repair shop 38x77 feet. There will be an elevator in the building and the basement will be fitted up as a heating plant. The entire work is of steel construction, doing away with all posts, so as to give the greatest amount of floor space possible; in fact, they claim that the building will give them a greater amount of space than any garage in Wisconsin.

Fond du Lac, Wis.—A stock company has been formed by a number of the business men of Fond Du Lac, Wis., which has taken over the automobile garage and salesrooms formerly controlled by G. W. Worthing, and will immediately start work on plans for a new building designed for automobile sales rooms, repair and garage facilities. Mayor E. W. Clark is one of the prominent men in the concern, and with the aid of G. W. Worthing, who has been retained as manager, the arrangements will be rushed as fast as possible. The agency for the Jackson car has already been secured.

Salt Lake City, Utah.—Work has started on the new garage and salesrooms for the Tom Botterill Company of Salt Lake City, which when finished will be one of the finest structures of the kind in that vicinity. The building is to be of the Spanish mission style throughout, having a frontage of 67 feet and depth of 170, with full cement basement. Although the present plans only call for one story, the arrangements of the roof and walls are such that other stories may be added later if necessary.

Westcott Garage Company.—The garage and automobile business formerly conducted by Chas. H. Childs & Co., in Utica, has been purchased by the Westcott Garage Company. This new firm, which has just been incorporated with Addison Westcott as president and William B. Westcott as secretary and treasurer, are making numerous improvements in the building that they may be in better shape to handle the increased business and to make it more convenient for their customers.

Asheville, N. C.—The increasing popularity of the automobile has caused the organization of a new concern to be known as the Western Carolina Automobile Company, which will be located at 61 South Main street. The agency for the Cadillac has been secured covering seventeen counties in this section of the State. Provision is being made for a first-class repair department with competent workmen.

Philadelphia, Pa.—It is said that a five-story public garage is to be erected at a cost of $500,000 on the corner of Broad and Fitzwater streets, which is to be directed by the Philadelphia Auto Company. Besides the thoroughly modern repair shop in the building, there will be 287 rooms, each large enough for two machines, which will be rented at $25 and $20 per month.

Washington, D. C.—The Auto Livery Company, which has built up such a prosperous business in Washington is putting up a new garage to accommodate 75 machines and 60 chauffeurs. Washington with its many visitors is essentially a place for the successful operation of an efficient taxicab service which this company has done its best to supply.

Chattanooga, Tenn.—George Reif and S. F. Webb have opened a garage at 10 West Sixth street and will do a renting, storage and repair business. They intend to take the agency for a well-known machine within a short time and will then move to Chestnut street.

Harrisburg, Pa.—Work is now in progress on the remodeling of the quarters of the Motor Vehicle Company, on Mulberry street. The new salesrooms will be 50 x 100 feet, with a large repair shop in the rear. The company will handle only Jackson cars.

Findlay, O.—Preparations are under way for one of the finest garages in the State outside of the larger cities. The C. F. Jackson Company has procured a lease in the Corwin block and will start immediately putting it in shape for garage purposes.

Little Rock, Ark.—W. L. Tedford is making arrangements for erecting a two-story brick garage of approximately 50 by 140 feet. Besides taking the agency for a number of cars, facilities will be provided for repairs and storage.

Brooklyn, N. Y.—The Grand Avenue Garage has just been incorporated in Brooklyn with a capital of $10,000 by F. H. Knauss and E. V. Slauson, of this city, and C. L. Beare, of New York City.

Minneapolis, Minn.—Plans are being made for a garage to be built at 1900 Lyndale avenue for M. H. Davin. It is to be a two-story brick structure, 100x135 feet, and will cost $12,000.

Kansas City, Mo.—The Kansas City Taxicab Company has approved plans for a three-story garage to cost $50,000.

A Leading Garage in the City of Mexico.

DIRECTOR PAGE ON THE FRENCH ROADS CONGRESS

WASHINGTON, D. C., Nov. 16.—Upon his return from the International Good Roads Congress in France, which he attended as chairman of the American delegation, Logan Waller Page, director of the Office of Public Roads, Department of Agriculture, gave THE AUTOMOBILE correspondent the following interview regarding the work of the congress:

"Inasmuch as there were three official languages at the congress—French, German, and English—it was impossible to make it much of a deliberative body. It was possible, however, for a general exchange of views on many matters pertaining to roads, and we were given the opportunity to inspect some of the great continental roads, and the methods of maintain them.

"The international bureau of roads, which was one of the things accomplished by the conference, and which was suggested by me, will have two or more representatives from each nation, and is patterned after the international bureau of navigation. The various members of the bureau will gather all the information regarding roads in their respective countries that may be of value, and submit it to the bureau. It will be gone over by experts, after which the information will be published and scattered all over the world."

Mr. Page had the satisfaction of seeing pass a resolution which he introduced, favoring the erection of a suitable memorial to the great French highway engineer, Tressauget. Tressauget preceded Telford and Macadam by 40 years, and in reality designed the broken stone road which is known as the Telford road. It was at his suggestion that the great system of what is called "continuous repair" road were established in France, and is still maintained. Under it a man, known as a cantonier, has charge of a certain section of the road, about five miles, and he goes over every foot of this daily, smoothing out irregularities, keeping the side drains clean, and trimming the trees and shrubbery.

"The reason French roads are so much better than other roads, and this a point that I wish Americans generally might realize," continued Mr. Page, "is that they are better kept up. The point to good roads is not so much their construction as their maintenance after they have been built. So far as road construction is concerned no country to-day has better or more economical roads than the United States, but in the maintenance of them we do nothing. We build a road, then let it go to pieces, and then build it over again. While there is considerable agitation for good roads in this country, there is little organized effort for them yet, although the automobilists are doing a great work in awakening general interest in road improvement. The best roads are in the 'State-aid' States; that is to say, States which have a road maintaining fund, but there still remains much to be done in the way of interesting State legislators in the improvement and maintenance of public highways."

N. A. A. M. SECURES FREIGHT CONCESSIONS.

Announcement is made by S. A. Miles, general manager of the National Association of Automobile Manufacturers, that its traffic department has again been successful in obtaining concessions of great importance to all the members of the N. A. A. M., the A. L. A. M., and the A. M. C. M. At a meeting of the Southern Classification Committee, held at Cincinnati last week, at which the associations named were represented by Mr. Marvin, manager of the N. A. A. M. traffic department, important changes were made in the Southern Classification. The Southern classification governs rates in the Southern States south of the Ohio and east of the Mississippi Rivers. It also, in certain instances, governs the through rates to points in the South from points in Central Freight Association territory (lying between Buffalo and Chicago), and rates from points east of Buffalo on shipments routed via Southern Dispatch lines.

AUTOMOBILE ENGINEERS MEET IN JANUARY.

In accordance with its custom the Society of Automobile Engineers will hold its fourth annual meeting In New York City during the course of the shows, and in order that members in New York for the purpose of attending either one of these functions may have an opportunity of being present, a dual date has been decided upon. The first sessions will be held Tuesday, January 5, adjourning to Tuesday, January 19, the first date falling in the week of the show to be held in the Palace under the auspices of the A.M.C.M.A. and the second during the week of the licensed show at the Garden.

In addition to an interesting list of technical papers the annual election for officers will be held, and it is anticipated that there will be an excellent number of the members in attendance. Further details of the places of meeting and the remainder of the program will be made public as soon as decided upon.

A. L. A. M. ANALYZES THE ENGLISH TIRE TESTS

CONSIDERABLE interest has been aroused by the reports of the tire slippage tests made on the Brooklands track in England by S. F. Edge, and Henry Souther, consulting expert of the Mechanical Branch of the Licensed Association, has made an analysis of the figures as published, which adds to their value. An instrument especially designed for the purpose made it possible to accurately record the number of revolutions of each of the wheels independently and for identically the same period of time, the tests thus giving the turns of each wheel separately.

The chief result determined was that the revolutions of the rear wheels were greater than the revolutions of the front wheels. That is, the driving-wheels would slip. Not content with tbe mere fact that they slipped, and that the slippage was greater with greater speed, Mr. Souther prepared from the data obtained in those tests a curve, which shows graphically what may be assumed as a fair average.

While the results as published simply indicate the number of revolutions that the rear wheels exceed the front wheels in the particular tests and with that particular machine, the data does not give the size of the wheels or the size of the tires or the length of the course. Without consideration of the other details that are involved, the results obtained by Mr. Souther's analyses indicate the percentage of tire slips.

From these results we have now added to our knowledge of automobile operation, the fact that on a level racing track of the best sort, with plain round tread tires inflated as is usual for racing, the percentage of slip of the rear wheels is about

0.3	for a speed of	40	miles	per	hour
0.6	" "	50	"	"	
1.1	" "	60	"	"	
1.8	" "	70	"	"	
3.7	" "	80	"	"	
5.4	" "	90	"	"	

In addition it appears that the driving-wheel on the inside, running around a curved track, slips a very little more than the outer wheel. This is clearly accounted for by the fact that the centrifugal force going around curves reduces the weight on the inner wheel, permitting it to slip more readily than the outer.

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THE WAY OF THE POLITICIAN.

There is a State Senator in New Jersey—the automobile law of which commonwealth it should be here remembered finds general disfavor from owners of motor-driven vehicles—and this legislator professes belief in various kinds of reforms, though his "new ideas" do not include any betterment in autoing conditions.

Crediting this supposedly astute politician with wisdom apparently beyond his years, the autoists asked him how they could better their lot and obtain amendments to a law which is unnecessarily severe on owners, injurious to the industry, and sadly detrimental to the State itself. In words that could not be mistaken the reform servant of the people advised the autoists to organize and go into politics. This advice was not disregarded.

And now for the sequel.

Among the candidates for a winter job at the State capital was this Senator, and he, among others, was asked how he stood on such relevant questions as lights at night for all vehicles, an increase in the speed limit for the open country, a tourist privilege in the matter of registration, and a curb on the indiscriminating activities of rural justices. The reform Senator didn't say much for the things which the autoists wanted and to which they thought—and still think—they were entitled.

A circular letter then found its way to the autoists and their friends in the district which the Senator has quite ably represented in the past. By a margin somewhat meager the reformer missed being a senator again this winter, and the awful charge is made that the autoists contributed in the distressing result.

Alarmed at the power which their stronger-hearted brethren have shown, a few weaklings from the ranks of the autoists are talking of "disciplining" the fighters for what they have accomplished, expressing fear that there will be harmful effects in the legislating that may be done at Trenton. Any such attitude is humiliating, as well as cowardly, and nothing will ever be gained by weak-kneed tactics at this late day. The New Jersey autoists have asked nothing unreasonable—in fact, they have been quite modest in their requests—and it is a thousand times better to be soundly trounced when your cause is a just one rather than to submit tamely to a continuation of injustice, which will be transparent to all in the course of time. The Jersey autoists are on the right track, and if they will firmly and consistently follow out their course as outlined, the final summing up will be substantially acceptable and gratifying.

* * *

INFINITESIMAL LEAKS FOOT UP.

Were all the water that sweats from the pores of a glacier and tumbles down the steep declivities to land in a tight-bottomed river, the trace of the river on the landscape would be erased and a lake would be there to tell the tale. The lake of broad expanse is but a defeated theory rendered impotent, merely because the river bed lacks homogeneity. The water seeps to lower levels and inefficiency holds sway.

It is so in other walks; in the automobile, for illustration, and to like extent, from the thermal point of view at any rate. Under far more favorable conditions than can be found in the average automobile, full 80 per cent. of the fuel goes to produce carbonic acid and water for the most part.

Likewise in the mechanism losses abound at every point of surface contact. Every squeak and each vibration is at the expense of the motive power. The very tires, that so effectually "swallow" the road inequalities, exact toll for labor performed, and the flywheel, that serves as a saving bank for the energy, exacts a banker's tribute, and a usurer's interest betimes.

Last, but not least, the muffler that cans the noise salts it with energy at the expense of the motor's power, and so it seems the little leaks and the trifling extravagances foot up to a grand total of over 90 per cent. of the thermal value of the fuel. It is the extravagance of nature conspiring with the egotism of man that renders this statement possible, and yet the automobile is a commercial success and pleasurable to contemplate. On the other hand, while practical men busy themselves in pursuits the returns on which are a scanty per cent., there is work to do for the conjurer who can cast a spell on nature and weave a web that will imprison the major portion, or, the share that intelligence should exact.

The cocksure featherweight who prates about establishing standards, hoping thereby to nail progress to a spot on earth no greater than the indentation made by a gnat's heel, wobbles about within the confines of the box called opportunity in a manner befitting the nature of his stunted perception and obtuse ways.

A. L. A. M. MEETS AND RE-ELECTS CLIFTON TO PRESIDENCY

AT its annual meeting for 1908, which was held at tbe association headquarters, No. 7 East Forty-second street, New 'ork, the board of managers of the Association of Licensed ıutomobile Manufacturers re-elected Colonel Charles C. Clifton, f the George N. Pierce Company, president for the ensuing ear. Thomas Henderson, of the Winton Motor Carriage Comany, was chosen vice-president; L. H. Kittredge, Peerless Motor ar Company, secretary, and Colonel George Pope, of tbe Pope anufacturing Company, treasurer. The executive committee or the coming year is as follows: Charles Clifton (Pierce), . T. Davis, Jr. (Locomobile), Thomas Henderson (Winton), . H. Stilwell (Franklin), and Herbert Lloyd (Electric Vehicle). S. D. Waldon, of the Packard Motor Car Company, was ppointed the A. L. A. M. representative on the Good Roads Cenal Committee.

The routine business of the meeting consisted of the reading f the reports of the various committees, that on the management nd which also treated of the present policies and work of the ssociation, being read by E. P. Chalfant, the assistant general ıanager.

Colonel George Pope, chairman of the sbow committee, reorted that the work of preparing for the ninth annual show) be held in the Garden under tbe auspices of the association 'as well advanced and that the show would surpass its predeessors considerably in both size and effect. The show comittee also granted an audience to representatives of the Motorycle Manufacturers' Association to consider the request of the ıembers of the latter for additional space at the Garden.

L. H. Kittredge, chairman of the handbook committee, reported that the sixth edition of tbe association's annual catalogue, officially known as the A. L. A. M. Handbook, would be issued shortly and contain matters of special interest.

The meeting, whicb was held Tuesday, November 10, was the largest ever assembled of the board of managers of the association, the following being in attendance: Elmer Apperson, Apperson Bros. Automobile Company; J. S. Clarke, Autocar Company; W. C. Durant, A. H. Goss, and C. R. Hatheway, Buick Motor Company; W. C. Leland, Cadillac Motor Car Company; Hugh Chalmers, and R. D. Chapin, Calmers-Detroit Motor Company; M. S. Hart, Corbin Motor Vehicle Corporation; Wm. E. Metzger, Everitt-Metzger-Flanders Company; H. W. Nuckols, and Herbert Lloyd, Electric Vehicle Company; J. H. Becker, Elmore Manufacturing Company; H. H. Franklin, and G. H. Stilwell, H. H. Franklin Manufacturing Company; E. W. Heading ton, Haynes Automobile Company; E. R. Hewitt, Hewitt Motor Company; A. N. Mayo, Knox Automobile Company; S. T. Davis, Junior Locomobile Company of America; Samuel Regar, Lozier Motor Company; C. W. Matheson, Matheson Motor Car Company; H. B. Joy, and M. J. Budlong, Packard Motor Car Company; L. H. Kittredge, Peerless Motor Car Company; Charles Clifton, George N. Pierce Company; Colonel George Pope, Pope Manufacturing Company; A. L. Pope, Pope Motor Car Company; G. E. Mitchell, Alden Sampson Manufacturing Company; F. B. Stearns, F. B. Stearns Company; A. H. Ackerman, Studebaker Automobile Company; E. R. Thomas, E. R. Thomas Motor Company; E. S. Church, Waltham Manufacturing Company; Thomas Henderson, Winton Motor Carriage Company.

MAN UNNAMED WILL SELECT CARS FOR PRESIDENT-ELECT

WASHINGTON, D. C., Nov. 14.—More than passing interest attaches to the official announcement made to-day that ter March 4 the automobile will be the official vehicle at the hite House. As is well know, President-elect Taft, unlike esident Roosevelt, is fond of riding in an automobile, on count of the ease with which it can be made ready and the ed with which it can take him anywhere he pleases to go.

An officer of the War Department, whose name is kept secret til certain plans can be formulated, and who is said to be authority on automobiles, has been detailed to select two s for Mr. Taft and his family for delivery after March 4, ment for same to be made from the public treasury. The sident-elect has not signified his preference for any parlar make of car, and the officer commissioned will inform omobile manufacturers of the general type of car wanted and they can make bids for furnishing two of them. The competition promises to be very lively, as this is the first time on record that an automobile will be used by a President of the United States, to the exclusion of the horse-drawn vehicles used by all his predecessors, and it will not only give the manufacturer who is lucky enough to be chosen considerable prestige, but will likewise give a big boost to tbe automobile industry.

While President Roosevelt has occasionally used automobiles, particularly during the summer seasons spent at Oyster Bay, he has consistently refrained from purchasing one for the White House stables. To-day, in company with Mrs. Roosevelt, he made a trip in a White steamer belonging to the War Department to Alexandria, Va., to witness some school games in which his youngest son competed.

FRENCH MAKERS ASKING IF SALON IS NECESSARY

ARIS, Nov. 12.—After holding an automobile show for 11 successive years, and making it the most attractive of all ublic exhibitions held in France, constructors are beginning ık themselves if after all it is worth while. At the present ent a circular is going through trade circles against the holdof any show in 1909. Those having signed it comprise a proportion of the leading firms—firms producing more 100 cars per year. The curious feature of the anti-show is that the firms popularly supposed to be at the head of use to acknowledge any connection with the circular, and those having signed, when questioned on the matter, assume iplete ignorance that is mystifying.

re appears to be a certain objection to continuing the show on the ground that it is too costly, and that the automobile industry has now settled down to the same position as any other trade, and has no need of special demonstrations. Few, however, are willing to state these views openly. "If the other firms do not want a show, we can very well do without it," is the general view. In official quarters the possibility of the eleventh show being the last is laughed at. "If the Salon were stopped money grabbers would step in and hold small exhibitions at which dealers would exhibit, if the factories would not. The individual cost of the Salon is so low that to abandon it would be folly." Meanwhile exhibitors are looking at the electric light, decoratinon, and wage bills, and wondering if it is wortb wbile to go to all the trouble and expense.

DETROIT WILL HAVE TWO SHOWS.

DETROIT, Nov. 16.—Whether Detroit can support two automobile shows a year is to be given a practical demonstration this Winter, according to present plans. Last Winter the Detroit Automobile Dealers' Association decided to branch out for itself, and hold a show in which the score or more of retailers both be given a voice in the management and a share in the dividends. They got both. It was freely predicted at the time that this foreshadowed the passing of the Tri-State Automobile & Sportsmen's Association, which had given six shows up to that time, being one of the pioneers. The association followed later with a show that left the promoters in a happy frame of mind.

Now the Detroit Automobile Dealers' Association is preparing to repeat last year's success, the show which will follow the one in Chicago to be given at the Wayne pavilion. The Tri-State Automobile Dealers' Association, far from being a dead one, has engaged Light Guard Armory for the last week in January, following the New York shows and preceding the one at Chicago, and will endeavor to show the Dealers' Association what a real automobile show is like. Manager McMasters is busy with the details for the Tri-State show, and expresses himself as well pleased with the outlook.

BRITISH SHOW OPENS THE SEASON.

LONDON, Nov. 13.—The seventh annual exhibition of the Society of Motor Manufacturers & Traders has opened its doors. As far as can be judged from present indication, the most interesting class will be that of the small four-cylinder car, in which the British maker has for some years been specializing. The trend of late has been in the direction of greater economy of maintenance, and the small car promises overmuch in this direction.

One of the special features will be the new "Silent Daimler" car, built under the patents of Knight, late of Chicago. Cars of similar type will be staged by the Minerva Company, who hold the Belgian license, and by the Panhard firm, but the production of the Mercedes concern, which is officially stated to have acquired the German rights, will not be ready till the date of the Paris show.

The exhibition of racing cars was expressly forbidden, and a second innovation, more indicative of common sense than the first, is the barring of all syren noise and horn blowing.

The show will remain open till Saturday, November 21.

PHILADELPHIA'S SHOW, JAN. 27 TO FEB. 3.

PHILADELPHIA, Nov. 16.—Necessity for a larger floor space than that afforded by the First Regiment Armory will necessitate the holding of next January's automobile show uptown, in the Second Regiment Armory, Broad and Susquehanna avenue. The change in location necessitates a change of date also, the Second's armory being engaged for the early part of the week originally decided upon by the show committee. The announcement was, therefore, made last week that the show would open on Wednesday, January 27, and continue till February 3, inclusive. J. H. Beck, whose work at several former shows made their success possible, has been secured as manager. He has opened offices at Room 216, Odd Fellows' Building, Broad and Cherry streets, in the heart of the automobile district.

CLEVELAND TRADE TO RUN ITS OWN SHOW.

CLEVELAND, Nov. 16.—At the annual meeting of the Cleveland Automobile Dealers' Company, held last Friday evening at the Cleveland Automobile Club, a show committee was authorized by the organization to conduct the next Cleveland automobile show. This is quite a departure from the method followed in former years, which has been that of engaging a manager. This committee consists of Hobart M. Adams, Clarence M. Brockway, and W. D. Price, who will have in charge the entire detail and the entire management of the 1909 Cleveland automobile show, to be held February 15 to 20, inclusive.

Brennan Construction, Harrall 1,200 Pounds Commercial Car.

THE HARRALL COMMERCIAL CARS

The Brennan Manufacturing Company, of Syracuse, N. Y., has recently completed a commercial car of 1,200 pounds capacity for the Harrall Buggy Company, of South Boston, Va., the details of which are of more than passing merit.

Take the chassis into account. A channel section steel 3x3½ inches of depth and flange, respectively. The width is 42 inches and the platform length is 118 inches. Allowing for the machinery and the driver's seat, the platform area is 42x72 inches. The chassis is suspended on semi-elliptical springs, perched on 1½ inches square front and rear axles. The front wheels are 39 inches in diameter, fitted with 3½-inch twin solid rubber tire. The rear wheels are 43 inches in diameter, fitted with 3¾-inch twin solid rubber tires. The steering gear is irreversible, of substantial design and accurate construction, and the linkages are straight line with liberal bearings, provided with means for oiling.

Model 7 has a power plant, two-cylinder opposed, 5 inches bore and stroke, respectively, water cooled, and rated by the makers at 16 to 18 horsepower. The motor connects with a planetary transmission, thence to a jackshaft and side chain drive. As usual with planetary gears, the high speed is direct drive and one low speed is provided in addition to the reverse The ignition is by means of jump spark and suitable battery.

Rapid Combination Chemical Fire Fighter.

Hutchineon, Kan., hae succumhed to the march of progress and has adopted the combination chemical car manufactured by the Rapid Motor Vehicle Company, of Pontiac, Mich. The chief of the Hutchinson fire department has rendered a very favorable report on the new machine.

LATE FALL ACTIVITIES OF THE AUTO CLUBS

"TRAPPING" RECEIVES SEVERE BODY BLOW.

PHILADELPHIA, Nov. 16.—A Philadelphian, with the able assistance of Barrister Edwin S. Nyce, ex-secretary of the Norristown Automobile Club, dealt a blow at the "trap" habit last week, from which it cannot recover for many moons, if at all. Automobilists generally have long but vainly insisted that the mere fact of a numbered tag being attached to a car which had exceeded the speed limit, did not necessarily imply that the owner was in the machine at the time. Magistrates throughout the State have taken it for granted, and have "soaked" the buyer of the tag accordingly. This question came up in the case of Charles W. Bacon, a Quaker City real estate operator, whose car was "piped off" by a trapper, and who was later ordered to appear and pony up.

But Bacon is a scrapper, and so is Nyce, whom he retained to fight the case, which came up in the Montgomery county court last week. Judge Weand was on the bench. His Honor, after hearing the facts, threw a bombshell into the trappers' ranks by handing down an opinion in which he sets forth that there was nothing in the pleadings to connect the defendant with the automobile in question, or with the act of violating the law, nor did it appear that the defendant was the owner of the car or was in it at the time. To sustain the conviction, it would be necessary to hold, without evidence, that the defendant was the owner of the machine and the occupant of it at the time. The proceedings are otherwise irregular, concludes Judge Weand, "in that the justice, after fining the defendant, required him to give bail for his appearance."

Henceforth, unless the Lower Providence township justice carries the case higher—which he will hardly do, in face of the rebuke administered to him by Judge Weand for collaring a fine and then compelling his victim to furnish bail—it will be impossible for every Thomas, Richard, and Henry who holds a justice's commission to issue summonses right and left after every clear Sunday, on the mere say-so of a trap artist who benefits financially in proportion to the number of victims he can corral. It does look as if it would be a lean Christmas up Lower Providence way.

MARYLANDERS WILL HAVE THEIR FIRST CLIMB.

BALTIMORE, MD., Nov. 16.—For the first time in its history the Automobile Club of Maryland, November 21, will conduct a hill climb. The contest will be under the rules and sanction of the A. A. A. racing board. The events have been divided as follows:

Class A—Cars selling for $850 and under.
Class B—Cars selling for $851 to $1,250.
Class C—Cars selling for $1,251 to $2,000.
Class D—Cars selling for $2,001 to $3,000.
Clase E—Cars selling for $3,001 to $4,000.
Class F—Cars selling for $4,001 and over.
Class G—Cars driven by amateur drivers only, $3,000 and under.
Class H—Care driven by amateur drivers only, $3,001 and over.
Class K—Free-for-all.

Owners who drive their cars for pleasure are the only ones eligible to participate in Classes G and H. The start in each of the events will be a flying one. The climb will be held on the Belvedere avenue hill, from Falls road to Roland avenue. A special electric timing apparatus will be used.

The club has decided to send circular letters to all car owners in Maryling enlisting them in the fight against the proposed special tax which Governor Crothers and the Maryland Automobile Commission desire to impose on autoists. The letters will also urge these owners to become members of the club.

The club members have gone on record as opposed to long tours. This action on their part was brought about by the reading of the report of the touring committee. The majority of the members are in favor of runs with time for a good dinner.

COL. JOYCE BOOMS MINNESOTA ASSOCIATION.

MINNEAPOLIS, Nov. 16.—No organization in the entire A. A. A. fold is making greater or more rapid strides in membership than the Minneapolis State Automobile Association. To Col. Frank M. Joyce, president of the association, is due a major part of the credit. Thanks to his hustling recruiting methods thirteen new clubs have been organized with a total membership of 1,800. Col. Joyce is confident that by the first of the year he will have raised the total to twenty clubs.

Under the inspiration of Col. Joyce's success in the State at large, the members of the Minneapolis Club are making strenuous endeavors to increase the club's membership during the winter months, so that by the opening of the touring season it will reach the 1,500 mark.

Local autoists are much interested in the new hill which is being framed for presentation at the next session of the Legislature. This bill will provide for State registration handled through one set of officials, so that it will be possible to obtain positive identification of any car in the State. It is also planned to have owners pay a State license tax, in lieu of a personal tax on their machines. This license tax would be figured on the horsepower of size and weight of the car. It is proposed to use the money derived in this way in good roads work, it being the idea of tbose framing the bill that such an act would meet with strong approval among the farmers and their representatives in the Legislature. It will be provided in the bill that no registration numbers shall be issued until the State license tax has been paid, and this will mean that 100 per cent. of the owners of automobiles will contribute to the funds of the State. As it is now it is said that of 5,000 machines in the State, about 1,500 are being paid for in the personal taxes of their owners..

Another provision of the bill will be copied from the Connecticut law, which provides, in the section applying to the rate of speed, that automobiles "shall at all times be driven at a reasonable rate of speed."

Other sections will specifically define the rights of automobiles as regards other vehicles and the rights of other vehicles as regards automobiles. The recent elections have changed the complexion of the Legislature somewhat, and the auto club members are confident that their bill will stand a very good chance of being passed.

RECENT WORK OF COLUMBUS AUTOMOBILE CLUB.

COLUMBUS, O., Nov. 16.—The members of the Columbus Automobile Club feel that since the club was organized last Summer they have already proven the good work which can be accomplished by a live club. During the few months of the club's existence the members have succeeded in bringing about one change in the city, that of traffic regulation, which they correctly think is not only of great importance in adding to the ease with which all traffic can now move, but of far more importance is the increased safety to all and especially pedestrians. Heretofore Columbus had no rules at all governing traffic, all vehicles wandering up and down the streets wherever they wished and on either side, so that the pedestrian was in constant danger, as he had no idea which way to look for passing vehicles. The automobile club took the initiative in applying to the city council for traffic ruling and with the help of the Columbus Vehicle Owners' Association carried it through successfully. When the new ordinance went into effect the club backed up its previous work by paying for special officers to assist the regulars for the first few days in the more crowded sections of the city.

In regard to the work usually taken up by automobile clubs the capital city enthusiasts have not been negligent. The committee on road signs has not been idle, and although it has not erected any signs so far, a report was turned in at the last meeting

containing recommendations as to the style, cost and number of signs to be placed. The work will be well organized and everything made ready during the Winter in order that the work may be started early in the Spring. In the matter of a club home rooms have been secured in the Northern Hotel, which are being remodeled preparatory to the club taking possession December 1.

WHAT PHILADELPHIA CLUBS ARE DOING.

PHILADELPHIA, Nov. 16.—The local automobile organizations are showing no evidences of winter torpidity. The Quaker City Motor Club will inaugurate its winter social season Wednesday night, December 2, with a banquet at the Hotel Walton. This function will be the first of the kind in the club's history, its activities being hitherto more along sporting lines. A score or more of celebrities, including Governor Stuart and Mayor Reyburn, besides other State and municipal dignitaries and the high lights of automobiledom, will be present as guests.

The Automobile Club of Philadelphia has appropriated money to revise the map tentatively issued last year and to issue four additional maps by March 1 next. These maps will cover territory as far east as the Delaware river, as far north as Easton, as far west as Lancaster, and south to within six miles of Wilmington, Del. Macadam roads, stone roads fit for spring traffic, and dirt roads will all be plainly indicated. The committee in charge of this work is also engaged in the completion of maps of the Water Gap region and the country beyond Lancaster. New radiator emblems, incorporating the A. A. A. insignia and the words "Pennsylvania Motor Federation" and "Philadelphia" are being delivered to members.

PLANS FOR ROAD IMPROVEMENT IN VIRGINIA.

NORFOLK, VA., Nov. 16.—At last the work of the Tidewater Automobile Association in its campaign for better roads seems to be bearing some fruit. The task of building a macadam road from Norfolk to Richmond has been actually started by the engineers on the Richmond end, who are preparing plans for a new road between that city and Petersburg. St. Julian Wilson, State highway commissioner, who has become much interested in the work which the automobile association has been striving to accomplish, has notified the Norfolk promoters of the plans at the Richmond end and recommended that they, with the aid of the Suffolk automobilists, direct their energy toward this end of the route. Work has already started with renewed vim to get the county and State authorities in this section interested in order that this half of the route shall not be the last completed.

TO EXTEND SHENANDOAH VALLEY PIKE.

WASHINGTON, D. C., Nov. 14.—Members of the Automobile Club of Washington, as well as automobilists throughout this section, are greatly interested in a movement that has been started to extend the famous Shenandoah Valley pike from Staunton to Richmond, Va. The project has the indorsement of financiers in all the cities and towns between Winchester and Richmond. From Hagerstown, Md., through Martinsburg, W. Va., Winchester, Strasburg, Woodstock, Harrisonburg, and to Staunton, Va., there is a fine turnpike 140 miles long, and with an extension to Richmond, it will be a highway about 225 miles in length, without a break. The Shenandoah Valley is the finest touring ground in this section.

WORCESTER CLUB TO HOLD ENDURANCE RUN.

WORCESTER, MASS., Nov. 16.—The Worcester Automobile Club completed arrangements for holding a 200-mile endurance and reliability contest on Tuesday, December 8. According to the rules of the contest the route willl not be known to the drivers until the start of the run, which will not only require all bonnets to be sealed, but gasoline consumption will be taken into account when the final reckoning comes. It is planned to start from the clubhouse at daylight and check in at the starting point every two hours. The interest shown by the local dealers and owners has assured the club of success.

MOTOR FEDERATION UNDERTAKES CAMPAIGN.

PHILADELPHIA, Nov. 17.—With the purpose in view of having a good roads bill introduced in the Pennsylvania legislature at its coming session, the Pennsylvania Motor Federation is undertaking an active campaign of education on the subject of good roads. The first tangible result of this is to be seen in Governor Stuart's open support of a $60,000,000 highway to connect Philadelphia and Pittsburg, as published in to-day's papers. This is due, somewhat, to influence brought to bear by the Federation, which has succeeded in having a request made for an appropriation of this amount.

In connection with the announcement of the governor's stand in the matter, the Good Roads Committee of the Federation is to-day mailing 14,000 circulars to the supervisors and mayors of thirty cities, the burgesses of 1,000 boroughs, and to 1,500 secretaries of town boards, thus including every supervisor in the State.

The Federation is working in the interests of a bill to secure a $50,000,000 appropriation for good roads, but owing to the necessity of obtaining a constitutional amendment, this cannot be put through until 1912. In the meantime, the Federation is asking for an annual appropriation of $5,000,000 until 1912, and there seems to be every prospect of obtaining it.

MILWAUKEE CLUB TO BUILD HOME FOR ITSELF.

MILWAUKEE, WIS., Nov. 16.—The membership of the Milwaukee Automobile Club has become so large that the board of directors has been increased from nine to fifteen members. The six new directors are: George C. Forgeot, Alfred Kieckhaefer, one year; George A. West and Oscar F. Fiscbedick, two years; M. C. Moore and O. Z. Bartlett, three years. The committee appointed to have charge of the matter of building a clubhouse consists of Clarke S. Drake, George A. West, C. W. Norris, Lee A. Dearholt and M. C. Moore. Sites are now being inspected. A campaign has been started for new members to insure a broad response when the actual work on the new clubhouse is begun.

A delegation of officials of the Milwaukee Automobile Club made a 200-mile tour to Monroe, Wis., November 14, as guests of W. L. Hibbard, agent for the Chalmers-Detroit, and instituted the Green County Automobile Club into the Wisconsin State A. A. The Green County Club has a membership of sixty.

HARTFORD CLUB WILL GO AFTER OFFENDERS.

HARTFORD, CONN., Nov. 16.—That the Automobile Club of Hartford is determined to force observance of the provisions of the present law is evident from the action just taken by the club attorneys. Several prominent members have been notified to appear before the board of governors, Wednesday evening of this week. The law-breakers will be given a hearing, and in two or three instances application will probably be made to the Secretary of State for the revocation of license. As matters now stand several daily newspapers in the State have taken a decided stand against autoists, and are clamoring for the repeal of the present law. Hence it is up to someone to do a little missionary work, and the local club intends to do its share. Various other clubs in the Connecticut Automobile Association will have the disturbing element on the carpet.

CHICAGO A. C. HAS AN EXCITING ELECTION.

CHICAGO, Nov. 14.—The annual election of the Chicago Automobile Club was fiercely contested, there being three tickets in the field, the third and last one, the opposition, sweeping everything before it, electing every one of its men. The results eliminated from the board of managers such well-known auto lights as Sidney S. Gorham, Burley B. Ayers and Charles E. Gregory. The new list of officials is as follows: President, Ira M. Cobe, re-elected; first vice-president, T. J. Koehler, re-elected; second vice-president, T. J. Hyman, re-elected; secretary, C. A. McDonald; treasurer, George S. Whyte; directors, Joseph F. Gunther, re-elected; John Farson, re-elected; Claude Seymour, re-elected; Ban B. Johnson, Allan S. Ray and F. W. Blocki.

Benjamin Briscoe, President of Maxwell-Briscoe Motor Company: "The bugaboo of threatening overproduction in the automobile industry is nothing new. The same cry was raised when the industry was just beginning to see its own great possibilities. It will require years to satisfy the requirements of the home markets. When that has been done—and we are a long way from it—there is the foreign market and then the commercial vehicle, which will keep us busy for a long time to come. The Maxwell factories alone will market nearly 10,000 motor vehicles of all kinds during 1909. That doesn't look as though we were afraid of overproduction."

When Mr. Briscoe made this statement he had just returned from California, whither he had gone to conduct negotiations for the erection of the fourth Maxwell-Briscoe factory.

C. L. Fleming, Manager of Union Carriage Company, St. Louis, Mo.: "Although not as yet established in its automobile plant, the Union Carriage Company is already figuring on a further addition. This will be necessary, as we have decided to increase our output to 1,000 complete cars for 1909. Before election we were undecided and to be on the safe side announced 500 as the number of cars which we would put on the market. But since election conditions have changed, and many inquiries are being received daily. Some days the number reaches 80, and all are good prospects. Last week we received orders for 12 more of our motor storm buggies."

Alexander Winton, President Winton Motor Carriage Company: "We have given the 'sixty' a most exhaustive series of tests and our every expectation has been realized. This, however, is only natural, for the 'sixty' is free from experimental features, representing elements that had already proved their worth in smaller power. The 'sixty' is produced to meet the demand for high power and large carrying capacity and is in every respect a car on which six-cylinder enthusiasts may place their faith without risk of disappointment." It is further stated that deliveries of the new $4,500 Winton "Six" will begin at once. This car has six 5 by 5 off-set cylinders, rated at 60 horsepower, carries a seven-passenger body and is equipped with a four-speed transmission, direct drive being on third speed.

William Mitchell Lewis, President of the Mitchell Motor Car Company: "In 1904 we were the $1,500 car pioneers, and built 315 automobiles of this model. The first car was sold to Horatio W. Hall, our Chicago agent, and is still in active service, as are 300 other machines of the 1904 output. Showing how accurately the Mitchell Company anticipated the requirements of the public, it is only necessary to add that the 1904 pioneer car was a four-cylinder 4 by 4 engine. This practically is the average of the present popular medium-priced car. The present 1909 model Mitchell—the entire output of about $3,000,000 worth of these cars has been assimilated by Mitchell agents—has a 4 1-4 by 4 1-2 engine, a wheelbase 3 inches longer, magneto ignition, selective transmission and refinements that the wisdom of Designer John W. Bate has suggested. The new 1909 $1,500 cars are capable of a speed of 55 miles an hour."

FOUR 1909 HERRESHOFF MODELS.

DETROIT, Nov. 16.—More than passing interest attaches to the filing of articles of incorporation at Lansing of the Herreshoff Motor Company, aside from the added impetus given the automobile industry in this city. Charles F. Herreshoff, famous as the designer of fast boats, and of late years consulting engineer for some of the largest automobile plants in America and Europe, has decided to make Detroit his future home, and is giving his personal attention to every detail of the new car which will be placed on the market, and which will be named after the designer. The claim made for the Herreshoff motor is its extreme refinement of construction and simplicity of design, the weight of the motor being reduced fully 40 per cent. without impairing its strength, thus permitting some radical changes and improvements in the construction of automobiles.

Although the creator of some of the fastest speed boats known, Mr. Herreshoff has always regarded this work as a side issue, his greatest fame being gained as a designer of auto frames, axles and transmissions, and as consulting engineer. The Herreshoff Motor Company has taken over a large plant here, and already has 500 men engaged on the 1,000 cars it will produce this season, and of which there will be four models.

BOSTON TRADE VERY OPTIMISTIC.

BOSTON, Nov. 14.—Boston's automobile trade is enthusiastic over the present condition of the trade and the future prospects. Not only in this city, but all over New England there is apparent a remarkable optimism concerning motor vehicles, and agents in the smaller cities are sending in larger orders than ever before, and seem to be confident of their ability to dispose of the machines as rapidly as they can be shipped to them from the factories. Locally there is hardly a dealer who is not much further ahead on orders than ever before at this season, and some of them have already begun to fear that they will have an experience similar to that of two years ago, when their allotments ran out before their customers were satisfied.

Present conditions amount almost to a boom, for the demand is not limited to any one class of car, but is felt by all classes, low, medium, and high priced. The immediate demand is for enclosed cars, and some dealers claim that they cannot obtain enclosed bodies rapidly enough. But there is always a very strong demand for open cars to be delivered in the Spring, and one dealer in high class cars shows figures to substantiate his statement that he has taken four times as many specifications up to date as he had taken a year ago at this time.

LACROIX AND BREYER ARE ON LA PROVENCE.

PARIS, Nov. 12.—Paul Lacroix, American selling agent of the Renault Frères, recently arrived from New York on the *Provence* and will stay in Paris not more than one week, probably sailing again on the same boat, leaving Havre the 14th, in order to be present at the Savannah race on Thanksgiving Day. The hurried European trip has been made solely for the purpose of arranging details for next season's business.

Another automobile passenger on the *Provence* on her next outward trip will be Victor Breyer, European representative of the American Automobile Association, who is making his annual trip to the States, and who will attend the Savannah race.

RAINIER FACTORY TO BE KEPT RUNNING.

SAGINAW, MICH., Nov. 13.—That the Rainier automobile works located here, which recently went into the hands of a receiver, will be kept in operation has just been announced by Jesse Walton, of New York City, the receiver, after a conference with the local management. It is not yet known just what form the reorganization of the business will take, but local capitalists are sufficiently interested in the business to keep it going at its present location. The company has a valuable site of 25 acres on the river front, with a modern brick plant.

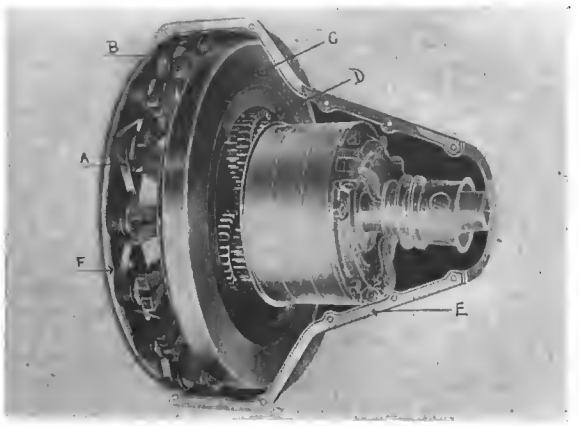


Fig. 1—Showing the complete assembly, with flywheel.

THE NEW FORD IGNITION SYSTEM.

The Ford Motor Company, of Detroit, has burned its bridges in so far as batteries, wiring coils, etc., are concerned, in that a magneto is built into the flywheel, and in itself constitutes the whole ignition equipment.

Fig. 1 shows the assembly complete, in which the letters denote: *a* = one of the magnets; *b* = one of the armature coils; *c* = flywheel on which magnets are mounted; *d* = planetary gear set; *e* = lower half of case; *f* = spider, holding the coils in rigid relation to the frame.

The spider holding the coils is shown in Fig. 2, while Fig. 3 shows the magneto on one face of the flywheel.

The Ford Company sets forth a manifold of claims for this system, and points out that the ignition is concentrated to but one point, instead of having its component parts spread out.

The functions of the "Ford" magneto are not unlike the similar functions of magnetos in general, excepting that the

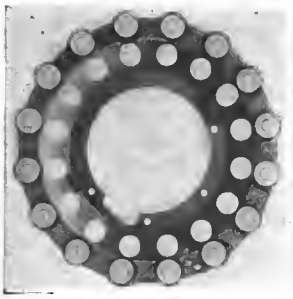


Fig. 2—Coil Spider, complete.

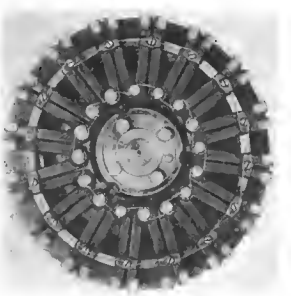


Fig. 3—Magnets on the flywheel.

"Ford" idea demands the use of multipolar magnets. In the operation of this system as applied to the Ford model "T" automobile for 1909, the permanent magnets, fixed on the flywheel, are caused to rotate past the coils, thus building up a "magnetic flux" in the circuit. This flux pulsates, and in doing so induces electrical potentials in the coils. For the rest, it is a matter of convenient timing and the windings of the coils as will induce a sufficiently high electromotive force in the secondary electrical circuit.

There are sixteen coils and an equal number of permanent magnets. The coils are of copper wire, suitably insulated, and one end of each is to "ground." The work in general is common to that which obtains in the construction of all electrical generators on a high plane.

The Ford system does not preclude the use of a battery auxiliary, but the need of the same is eliminated, besides concentrating the ignition system in such a way as to facilitate manipulation.

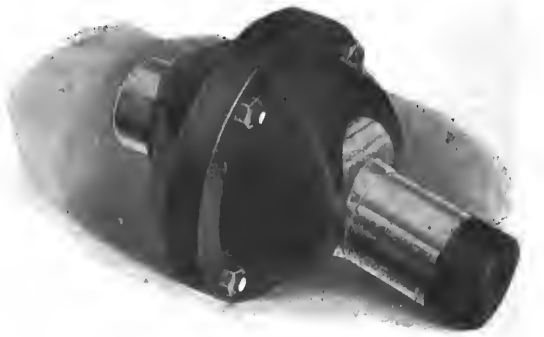
STUDEBAKER CUP FOR THE A. A. A. TOUR.

South Bend, Ind., Nov. 16.—Col. George Studebaker has decided to offer a trophy to be known as the Studebaker Gold Cup, to be contested for at the same time as the Glidden and Hower trophies, during the A. A. A. annual tour. The cup is valued at $5,000. Colonel Studebaker believes that the automobile has reached a stage of development where something more than the present rules of the Glidden contest must be required to prove efficiency, and although he imposes no specific conditions, he makes the donation with the suggestion that all devices known to the contest committee shall be utilized to guard against repairs and replacements.

A DUST-PROOF UNIVERSAL JOINT.

The Hartford Auto Parts Company, Hartford, Conn., will entertain the trade during 1909, in a most acceptable manner through the good office of its "Type C" dust-proof Universal joint, and the self-lubricating feature of the same should gain for it admittance to the elect.

Recognizing the potency of the crystallized fact that in any structure no link is stronger than the weakest, the "Type C"



Exterior View of the "Type C" Assembled Joint.

joint is designed, according to the makers, to sustain under all torsion that can emanate from a crankshaft of the finest grade whose diameter will equal the diameter of the hole in any one size made of the "Type C" universal joint.

The ball and socket feature is adequately shown in the illustration, but to conclude without quoting the makers on the question of accessibility would be to do the subject scant justice: "As simple and accessible as the most critical could demand. Without tools the joint can be taken apart in a few seconds and the matter of assembling the entire drive equipment on a car should not demand over ten minutes of a workman's time."

The J. S. Bretz Company, Times building, New York City, is the authorized vendor.

"Type C" Joint Dissembled, Showing the Parts.

INTERESTING NEWS IN GENERAL

Edition De Luxe of Rambler Magazine.—An attempt at something a bit above the ordinary in house journalism is in evidence from Thomas B. Jeffery & Co., makers of the Rambler automobiles. A special edition of the *Rambler Magazine*, printed in two colors and packed from cover to cover with snappy illustrations and instructive views showing the best method of building and selling automobiles, is now being mailed to dealers throughout the country. The book contains a picture of the Rambler factory, claimed to be the largest automobile plant in the world; a portrait of Thomas B. Jeffery, who made its great success possible; the announcement of the new Rambler models; the details and exposition of all the special Rambler features, including the new Rambler spare wheel; a profusely illustrated story of the methods of making and testing of Ramblers; and a story of the sales organization and the great record made by this concern during the past eight years. This magazine much resembles a standard publication.

Difficultiea of Touring the South.—J. H. Smith has just returned to his home in Atlanta, Ga., with some interesting tales of the experiences he encountered while on a 2,000-mile tour among the mountains of Georgia and North and South Carolina in a Pope-Hartford touring car. One day while trying to reach Greer, S. C., through mud and rain, he was obliged to dig a path around a deep mud hole in the Tugaloo river bottoms. Having no shovel in his tool equipment, he was compelled to make the best of a tire iron, which naturally made very slow work. A few days after reaching Spartansburg a street car butted into his machine and smashed the lamps, fenders, radiator and almost everything else that would bend on the front of the car. After awakening the motor sufficiently to back off his car, Mr. Smith loaded bis machine with the broken parts and drove to a repair shop, where he rigged up a radiator out of a tin box which did duty for the rest of the trip.

Twenty-six European Makers Use Hele-Shaw Clutchea.—This clutch, exploited in this country by the Merchants & Evans Company, Philadelphia, is now used by some twenty-six separate European automobile makers in their 1909 products. This clutch, it will be remembered, is of the multiple disc type, differing from other multiple disc clutches in that the discs do not bear on their flat faces, but have conical grooves that engage on their faces. The members are submerged in oil, but the action is such that the engagement is attended with much certainty, and without evidence of "fierceness." For a given motor, the clutch ability is said to be attended with but little pedal pressure. The actual contact surface is a maximum, while the effectiveness is multiplied through the angularity of the engaging faces.

To Sell Remy Magnetos.—Automobile trips have been undertaken for all kinds of things, and that now being run by A. T. Mosher and Harry Harter in the interests of the Remy Electric Company, Anderson, Ind., adds a new phase. They are making a run of several thousand miles, which will take them from Anderson, Ind., to Savannah, Ga., to New Orleans, Galveston, Tex., St. Louis and back to Anderson, for the purpose of demonstrating and selling the new Remy high-tension magneto. This is of the inductor type and is extremely simple and effective, as there are no moving wires or connections in the primary circuit.

Goodyear's California Performances.—The W. D. Newerf Rubber Company, of Los Angeles, Goodyear tire agents for the Pacific coast, have been particularly energetic in equipping competing cars in various events. According to the Newerf Company, the Goodyear tire now holds the San Francisco-Los Angeles record, on a White steamer; the San Francisco-Los Angeles and return record, the San Francisco-Portland record, Los Angeles-San Diego record, on a KisselKar, and also Los Angeles-Newhall, and the Los Angeles-Victorville records. Forty-one out of forty-seven firsts is clamed for track events with a tourist car.

Annual Meeting of the A. S. M. E.—The twenty-ninth annual meeting of the Society will be held in the Engineering Societies building, 29 West Thirty-ninth street, New York, December 1 to 4. The notice says: "Tbe professional and social opportunities afforded by these meetings are being realized by the members, as is sbown by the constantly increasing attendance. Five years ago at the annual meeting there were 474 members and guests present; last year, notwithstanding the general unsettled financial conditions, there were 1,232 in attendance, which shows an increase in the past five years in round numbers of 750."

Earl Now Known as Petrel.—The defunct Earl Motor Car Company, of Kenosba, Wis., manufacturers of the Earl friction drive cars, bas been reorganized under the name of the Petrel Motor Car Company, and its product will be named the "Petrel." Samuel W. Watkins, founder of the Beaver Manufacturing Company, Milwaukee, builders of engines and motors, is at the head of the new company. The Petrel company will occupy the former Visible typewriter plant at Kenosha, the Earl's old bome.

Willard Company Haa New York Depot.—The Willard Storage Battery Company, of Cleveland, O., has opened an office and battery depot at 1876 Broadway, corner of Sixty-second street, New York City, where it will take care of its battery business for the metropolitan district. The depot will be fully equipped with apparatus for assembling, charging and crating batteries ready for use. The depot will also take care of the charging of vehicle batteries and batteries for sparking, lighting and other purposes.

No Advertising for Palace Show Program.—An announcement from the American Motor Car Manufacturers' Association contains the information that the Palace Show program will contain no advertising. They will be distributed free, with a full list of names and business of each exhibitor. The show committee is of the opinion that the tone of the show is kept higher by keeping out the advertising and distributing without cost.

Three Tire Replacements in a 24-Hour Race.—A remarkable tire record is claimed in the 24-hour race at Los Angeles, Cal., when the winning Locomobile completed the around-the-clock contest with only three replacements of its Fisk bolted-on tires. That is to say, the car used only seven tires for the entire race, and in these events tires are generally "burned up" by the dozen.

Two Indiana Companies Consolidate.—The Stanley Automobile Manufacturing Company, of Mooreland, Ind., has consolidated with the Troy Buggy Works Company, of Troy, Ind., and has moved its entire plant to that place. With the increased facilities the company will continue to manufacture the Stanley automobiles in the name of the latter company.

Archbishop Joins the Automobilists.—One of the latest converts to the use of the automobile is Archbishop O'Connell, of Boston. A 40-horsepower Pierce Arrow landaulet has been presented to him by the laity of tbe city of Boston. The committee wbich was appointed to examine a number of cars chose the Pierce Arrow as being what they desired for a present to the Archbishop.

Champion Will Make Magnetos.—At Flint, Mich., the Champion Ignition Company bas been organized, with Albert Champion, of Boston, at the head, to manufacture magnetos.

IN AND ABOUT THE AGENCIES.

"Alco," Northweat.—The American Locomotive Company's "Alco" will be handled in the Northwest for the first time by the Victoria Motor Car Company, of Minneapolis, Minn., a new company composed of Charles H. Robinson, Arthur W. Armatage and Robert H. Rose. The territory given the new company extends to the coast, and elaborate arrangements are being made to handle the business in a satisfactory manner and to make a record the first year. This company has commodious quarters at 1312 Hennepin avenue, where over 7,000 feet of floor space will be devoted to the "Alco" line, garage and repair departments.

Overland, Wichita, Kan.—Tbe Star Automobile Company has been formed in Wichita, Kan., by a number of men interested in the automobile industry and the agency for the Overland car has been arranged for. The company will erect a two-story building designed especially for sales rooms and garage purposes. The incorporators include Hugh E. Roberts, E. N. McGregor and A. C. Houston.

New Goodrich Tire Branches.—The B. F. Goodrich Company, of Akron, Ohio, has established branches in the following cities: Kansas City, Mo., 1728 Grand avenue, manager, Fritz Oberhue; Minneapolis, 827 Hennepin avenue, manager, E. W. McCreery; Pittsburg, 5900 Penn avenue, manager, H. L. Bouker; Atlanta, Ga., 64 North Pryor street, manager, E. V. Wilkinson.

Rauch & Lang Company, Ohio and Indiana.—The Rauch & Lang Carriage Company, makers of R. & L. electrics, announce that E. W. Livensparger, of Cleveland, has been appointed district agent for Ohio and Indiana, where he will establish all agencies. Branches have already been arranged for at Lima and Canton, Ohio, and at Fort Wayne, Ind.

Middleby, Philadelphia.—William P. David, long connected with the Maxwell agency in Philadelphia, is at the head of the Standard Motor Company, 616-618 North Broad street, which has just been awarded the local agency for the Middleby car, manufactured by the Middleby Auto Company, of Reading, Pa.

Studebaker, Atlanta.—The entire line of Studebaker cars will be represented in Atlanta by the Georgia Motor Car Company under the management of George

W. Hanson, who will act as distributing agent for the State of Georgia. Garage and salesrooms have been secured on North Pryor street.

Brush, Philadelphia.—The little Brush car effected a lodgment in the Quaker City last week, when the Oxford Automobile Company, 1615 Willington street, secured the local agency. Already arrangements for the placing of a number of sub-agencies are well under way.

Michelin Tires, Pittsburg.—The Pittsburg Auto & Repair Company has secured the exclusive agency for Western Pennsylvania, Eastern Ohio, and West Virginia for Michelin tires.

Republic Tires, Kansas City, Mo.—The Republic Rubber Company will be represented in Kansas City by E. P. Moriarty & Company.

PERSONAL TRADE MENTION.

George B. Adams, a pioneer of the auto trade world, has become connected with the Detroit-Cadillac Company of 303 West 59th Street, Manhattan, and will devote his attention to selling the new Cadillac "Thirty." Mr. Adams will be remembered as far back as 1899, when be occupied the position of president of the Adams-McMurtry Company, whicb at that time held the agency for Packard cars in New York. This agency was later changed to a branch and Mr. Adams became the manager. Since that time Mr. Adams has been connected with the Pope and American Locomotive companies. He was one of the organizers of the original trade association in New York, in wbich he held the position of vice-president.

Ernest H. Brandt has tendered his resignation as general manager of the Detroit-Cadillac Motor Car Company, of New York City, to accept the management of the Eastern distributing depot of Thomas B. Jeffery & Company, makers of Rambler automobiles. The headquarters will be in the Rambler Building, 38 West Sixty-second street, New York City, and Mr. Brandt will have charge of territory comprising Virginia, Maryland, Delaware, New Jersey, Pennsylvania, east of Altoona; eastern New York State, and western Connecticut.

Charles B. Shanks, sales manager of the Stearns Motor Company, was in Minneapolis during the past week, on his return from his Pacific coast trip, on which he started in September. Mr. Shanks is much enthused about the prospects in all the cities he visited, including Chicago, Denver, Portland, Spokane, and Seattle. In his opinion there will not be enough high quality cars made this year to satisfy the demand. Up to date the Stearns factory has taken more orders than ever before in a whole season.

Eugene Grunewald, superintendent and chief engineer of the Moline Automobile Company, of East Moline, Ill., was united in marriage on November 11 to Miss Pauline Haak, a young society woman of Davenport, Ia., the ceremony being performed at the home of the bride's father in that city. Mr. and Mrs. Grunewald left for an extended Eastern tour immediately after the ceremony, and will attend the Grand Prize race at Savannah, Ga., on Thanksgiving Day before returning to Moline.

George Holloway, who for the past 16 years has been general superintendent of the Elmore Automobile Company, has accepted a position with the Vim Motor Manufacturing Company, of Sandusky, Ohio. The Vim company proposes to enter the automobile field with a two-cycle motor of much the same design as the marine engine made by it at present.

Alfred Measure, manager of the Morgan & Wright branch in Boston, and for the past eight years connected with that firm, has accepted a position as office manager for Alvan T. Fuller, Boston agent for the Packard and the Cadillac. Mr. Measure was in the bicycle business before going with the Morgan & Wrigbt firm.

David J. Post, of the Veeder Manufacturing Company, Hartford, Conn., and a member of the American Motor Car Manufacturers' Association's show committee, has sailed for Europe to attend the London, Paris and Berlin automobile shows, gathering data and the latest ideas in European showdom.

E. LeRoy Pelletier has again been chosen to manage the show of the Detroit Association of Automobile Dealers. Mr. Pelletier looks after the advertising and publicity of the Everett-Metzger-Flanders Company and the Studebaker Automobile Company.

William J. Slater, advertising manager for the Firestone Tire & Rubber Company, has severed his connection with that concern to take up the general management of the Kalamazoo (Mich.) *Telegraph*, a newspaper in which he is financially interested.

R. B. Jackson, who was general manager of the E. R. Thomas Motor Company, of Buffalo, np to Oct. 1, 1908, has rented the old Northern plant at Detroit, where he is preparing to start in on the manufacture of automobile parts.

J. S. Conwell, formerly general manager for the Auto Vehicle Company, makers of the Tourist car, has joined the Maxwell-Briscoe Company selling forces as general manager in the Southern California territory.

Louis J. Sackett, well known to the automobile trade, is exploiting the merits of the Stearns cars for Wyckoff, Church & Partridge in the territory east of Buffalo and Pittsburg.

H. J. Edwards, chief engineer of the Dayton Motor Car Company, has sailed for Europe to attend the London and Paris automobile shows.

Harry Sheldon, representing the Con-Continental Tire Company, is spending a few weeks on a visit to the Pacific coast territory.

Dan J. Cohen, formerly with R. M. Owen & Company, has been added to the sales department of the Oldsmobile Company.

Russell Huff, chief engineer of the Packard Motor Car Company, has sailed for Europe to attend the Paris show.

R. H. White, of Detroit, has joined the selling forces of the White Company.

GEORGE A. BURNHAM KILLED.

DETROIT, Nov. 14.—George A. Burnham, general factory manager for Morgan & Wright, was accidentally killed while duck hunting at the St. Calir flats near Pearl Beach, this afternoon. Mr. Burnham was out in a boat and while trying to put his gun back of him a cartridge exploded, the load entering the neck at the base of the skull. Mr. Burnham was 34 years of age and had been in the employ of Morgan & Wright since 1893, with the exception of 1 year during the Spanish-American war. He left a widow and three children.

HAYNES INCREASES CAPITAL.

KOKOMO, IND., Nov. 16.—In order to carry on operations on a more extensive scale than heretofore, the Haynes Automobile Company, one of the oldest concerns in the country, increased its capitalization from $300,000 to $600,000 at a meeting of the stockholders held here last week, at the same effecting a complete reorganization. A large part of the increased capital stock has been subscribed by local investors, so that Kokomo stockholders will be largely in the majority. Home control of the company has been vested in the local interests for the coming five years by the terms of the reorganization. This step has been contemplated for some time, and would have been taken earlier in the Fall, had it not been for the unsettled business conditions. The directors chosen at the stockholders' meeting are as follows: Elwood Haynes, C. H. Haynes, Henry C. Davis, Stephen Tudor, A. L. Thalman, William Johnson and George W. Charles, of Kokomo, and W. M. Haynes and C. C. Cartwright, of Portland, Ind.

The directors held a meeting immediately after the completion of the reorganization and passed a resolution creating a board of trustees, composed of three members of the directorate, and empowered it to vote a majority of the stock as a unit for the next five years, in order to insure local control of the company's affairs. The trustees selected were H. C. Davis and Richard Ruddell, of Kokomo, and C. C. Cartwright, of Portland.

The Haynes plant had a very modest beginning, but its growth has been rapid and both its buildings and machine equipment entitle it to rank high at the present day. The entire Haynes force is now busily employed in getting out a series of 200 of the new Model X cars.

ELECTRIC VEHICLE REPORT.

HARTFORD, CONN., Nov. 16.—Halsey M. Barrett and Henry W. Nuckols have filed their report as receivers of the Electric Vehicle Company of business during the month of October. According to the September report, the receivers had cash on hand amounting to $208,188.45 and collections brought the figures up to $304,804.53, including $77,914.04 for royalties. The October report shows a balance on hand of $175,834.28, November 1. Cash sales for the montb amount to $22,592.02, which also includes charges on account.

Listed in the receipts is an item of $77,914.04 from Selden royalty, and in the disbursements is listed an item of $76,580.41 to the Licensed Association. It will be noted that practically all the money received from the Selden royalty was turned over to the Licensed Association, the reason for which is that after the company had passed into the hands of the receivers a new royalty agreement was necessary, and this came about in due course with the consent of the courts. A definite maximum sum that the Electric Vehicle Company should receive in any one year was fixed and the company before the month of October received this sum, with the exception of about $1,300, and the excess over $1,300 was turned over to the Licensed Association. The balance on hand November 10 is smaller than that of October 1, but it must be borne in mind that a larger force is now employed and that more extensive operations are being carried on than heretofore. All things considered, the receivers are doing exceptionally well.

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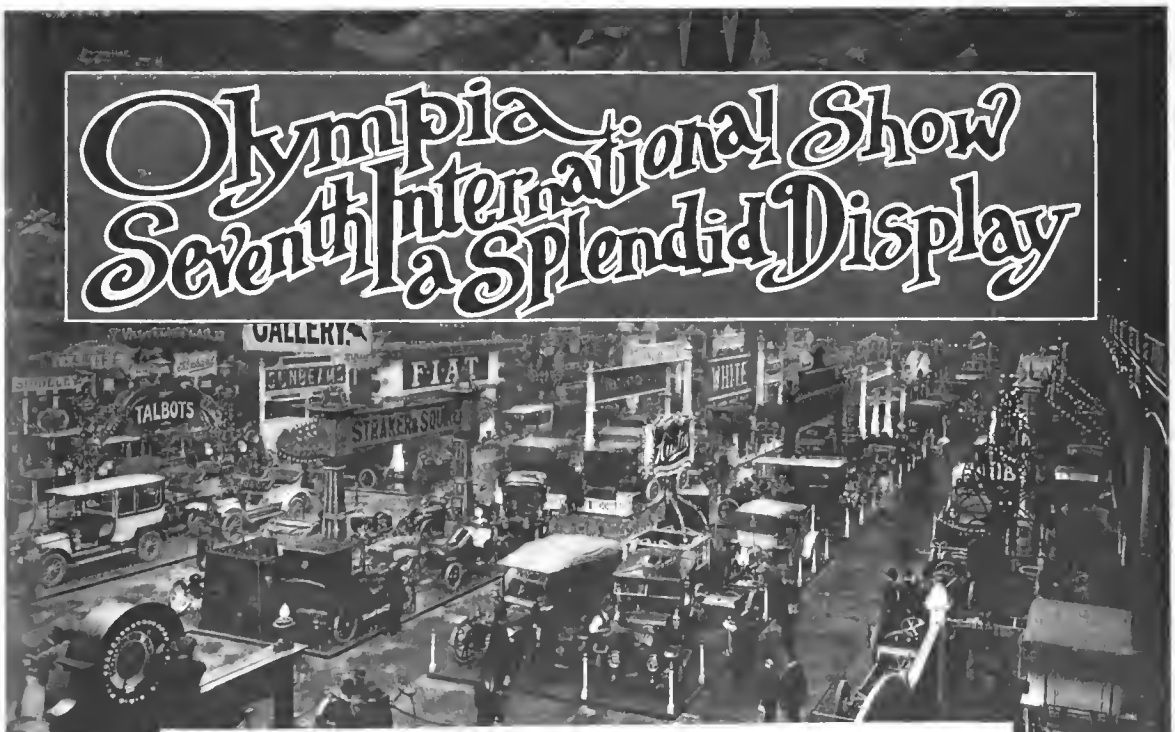
THE AUTOMOBILE

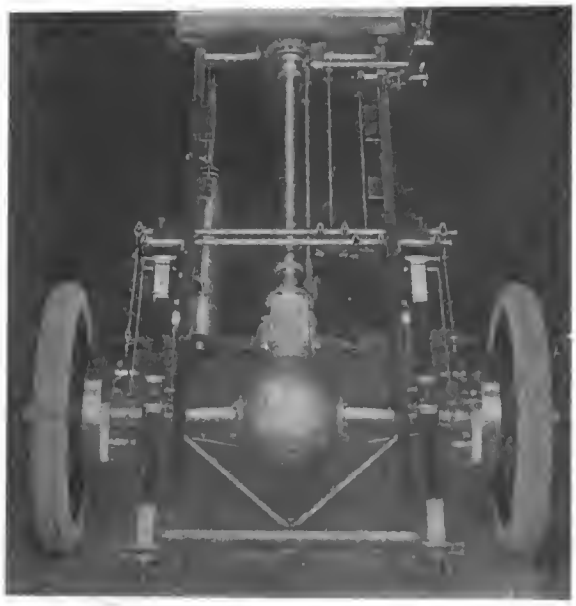
Olympia Seventh International Show a Splendid Display



LONDON, Nov. 13.—The Society of Motor Manufacturers and Traders opened their seventh annual pleasure vehicle show at Olympia this morning, under the patronage of the King. Unlike previous years, there was no opening ceremony, but there was no lack of visitors in consequence, and from the opening hour of 10 a. m. a steady stream of better class visitors made their way in. This of itself marks a distinct change from former shows, when the first days have not attracted much attention. Already good signs of business are apparent and the end of the first day finds the general body of exhibitors in an excellent humor.

In all past exhibitions the racing car has been a big attraction, and the stands that included the battered victors of the season's speed contests always attracted interested crowds. This is to be no more, for, complying with public opinion—or that section of public opinion which is represented by two or three noisy half penny papers—the promoters decided that anything that savored of motor racing must be banished forthwith. Hence it is that the Hall to-day contains neither racing car, nor is any literature permitted to be distributed that appertains to so terrible a sport!

But while many will be found to criticize the promoters' action in this respect, the majority both of exhibitors and of purchasers will probably agree with the decision to abandon trial rides. The experience to be gained in a few minutes' ride around the building would not materially influence a purchaser, and yet such runs have in



Gear-boxless Sheffield-Simplex Chassis.—Rear View.

the past been a big source of trouble and expense to the exhibitors. The serious purchaser can now make a definite appointment for a more thorough test and the only person that will be disappointed is the man who is accustomed to go up to Hammersmith for an afternoon's outing on the cars. This class became too numerous for the comfort of the exhibition to tolerate.

Everywhere can be observed the tendency towards reduction of noise. Just as a year ago engine flexibility and the perfection of the lubrication system were the aims of the designer, so now noiselessness is the feature on which greatest stress is laid. In the case of the Daimler-Knight valveless engine absolute silence of operation is put forward as its biggest advantage. Numerous other makers retaining the mushroom valve engine have adopted the plan of covering the whole of the valve arrangement with an aluminum plate, and also, of altering the form of the valve lifting cam. Throughout the rest of the car this quieting process is apparent. The exhaust long ago ceased to be objectionable, so now the incoming gases are silenced, the Daimler and Iris carbureter being prominent in this respect. The gear pump has been replaced on several cars by the smoother-acting centrifugal variety, or better still, has been omitted altogether, the natural circulation being now relied on. Other instances present themselves in this refining process, and if for the next show designers will but consider the question of reducing the dust raising properties of their cars, the public will have little to complain of.

Of general tendencies of design much is apparent. During the past season the various voiturette races in France and the "four-inch" race in this country have shown what excellent results can be obtained from a well-designed and carefully constructed small car. As a result there is a big increase in the number of such cars staged, these being frequently met with on the stands of the best known makers.

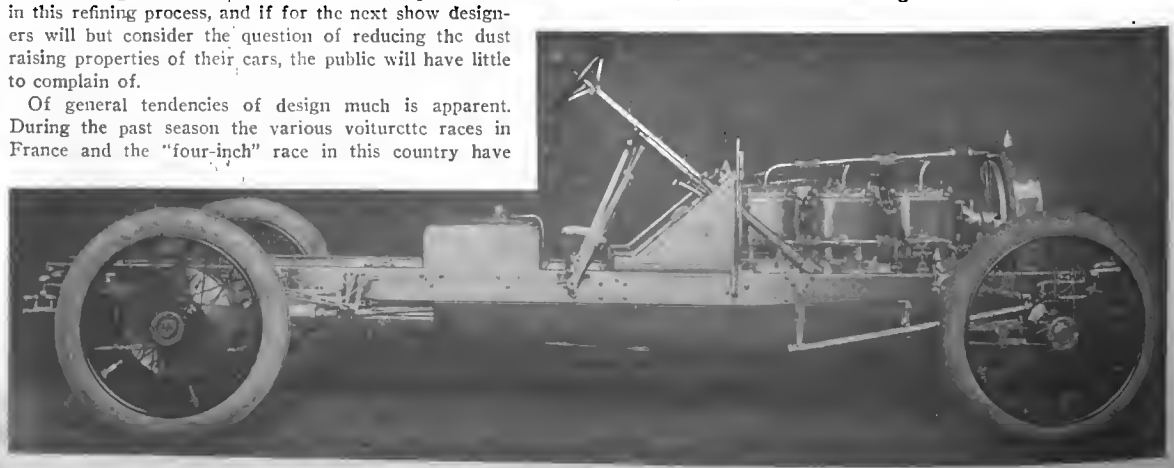
The single cylinder engine has almost lost its premier position by reason of the popularity of the small four-cylinder variety, in which the bore is as little as 65mm.—this being the case with the De Dion and the Martini. Even the six-cylinder engine has found its adherents, and such cars as the 12-horsepower six-cylinder Delaunay-Belleville are well worth inspection. Interesting examples of these small cars will be detailed later.

What the Motors and Their Appurtenances Show.

A second feature of note in engine construction is the re-introduction of the twin-cylinder type. At last year's show this form of engine had almost entirely disappeared and engine types seemed definitely to have resolved themselves into the single, the four and the six. The popularity of the engine of about 10-horsepower has now led to the feeling that something between the one and the four is required, so that the twin-cylinder engine is likely to have a greater vogue than ever. Hardly less noteworthy than the increase in the voiturettes is the prevalence of the "four-inch" engine—usually with a five inch stroke, but tending, if anything, to exceed this value. The increased power given by these small engines is well indicated by the generous provisions of covered bodies on such cars, whereas in former years nothing smaller than a 30-horsepower 4½ by 5 engine was considered sufficiently powerful for a limousine or full-sized landaulet. As a natural result the bigger type of car tends to decrease in numbers, and by next year this decrease should have assumed definite proportions. Beyond the big car there still exists a class which is to all intents and purposes a racing car with a small and uncomfortable touring body fitted. Among cars of this type that are on view may be noted the 100-horsepower Germain and the 90-horsepower Napier, Fiat, and Gobron-Brillié.

The general success of the long stroke and high piston speed engine in the four-inch race showed itself almost too late to affect the present models. This tendency, however, can be observed in the case of the smaller cars, where the stroke is between 1¾ and 1½ times the bore. Apparently not a single car in the show has an engine with stroke less than the bore—a change from last year, when several examples of the 4 by 3 and 5 by 4 type were staged.

Cylinders all cast in one block now find general favor. The former big objection of excessive cost of replacement when a cylinder was damaged is greatly discounted now that the public realize that cylinders do not require replacement every few months. From the maker's point of view the saving of space, as well as the general simplification of the piping and water connections, makes the block casting a favorite.



Side Elevation of Chassis of the Gear-boxless Sheffield-Simplex, Showing Undershield and Gasoline Tank in Position.

In the Deasy 15-horsepower model, as in the 18-horsepower Ford, this method is carried even further, and the top half of the crankcase forms one casting with the four cylinders. This design makes a very neat job indeed, and by casting the supporting arms in aluminum and bolting to the engine casting, the latter is kept from becoming unduly cumbersome.

Ball bearing engines have not increased in numbers and the practice may therefore be regarded as still under trial. In other parts of the running gear the ball bearing is almost universal.

The general introduction of forced lubrication systems was a feature of last year's exhibition, and to such an extent has this commendable practice been carried that now the splash system with drip feed is retained only on the cheapest type of voiturette.

Carburetters are still far from settling down to uniform design, and hardly any maker has retained the 1908 carbureter without change. The two and three jet type is frequently met with, but the uncertain spring controlled devices are still in great numbers. On the Daimler three-jet carbureter a water-heated silencer is fitted.

A year or two ago the pressure fuel tank at the rear seemed likely to disappear, its two enemies being its liability to choking of the pipes and its alleged dust raising qualities. The latter has in general been disproved by the Royal Automobile Club experiments, while the first named trouble is obviated by dispensing with the exhaust gas and employing in its stead air pressure from a pump driven off the camshaft. The fact that this air pump might be made larger and used to operate a self-starting system does not seem to appeal to the generality of designers and but a few cars—the S. C. A. T. and the 60-horsepower Fiat for example—are so equipped.

The many other forms of self-starters so eagerly brought forward two years ago have all entirely disappeared

In the ignition section the high tension magneto is almost universally employed. Even the low tension variety has finally lost its popularity with the Italian cars and is not found save on a couple of Fiats. In spite of the fully-proved reliability of the magneto, however, there is still a general practice of fitting an accumulator and coil system as a standby, but whereas last year this was invariably of the high tension distributor with one coil type, several makers have this year used the low tension distributor with a special four unit coil having but a single trembler. This is found to give a good synchronization of the former type with less cost and insulating trouble.

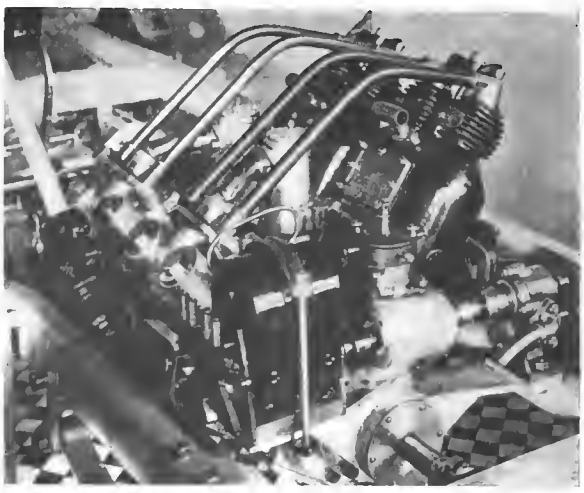
In the Matter of Gear Boxes and Clutches.

A general—and necessarily hurried—examination of the cars leads to the conclusion that clutches are in the same position as last year, as far as popularity of the rival form goes. Several new makers fit the disc clutch, and particularly is the new Hele-Shaw clutch remarkable in that all parts, save the phosphor bronze outer plates, are of pressed steel, thus effecting considerable weight-saving. On the other hand one or two makers, including Austin and Weigel, have reverted to the leather cone clutch, so that the balance of power is almost unaltered. The other types of clutch, whether of the expanding or the contracting variety, have almost disappeared, and the Motobloc and the Mors are probably the sole remaining exponents of the two types. The use of cork inserts has not yet come into favor on this side.

Meanwhile the hydraulic clutch is being quietly worked out, and it is said that by the next show a satisfactory example will be exhibited of this combined clutch and gear which would seem likely to oust, altogether, the present unmechanical devices.

The gearing question now seems to demand but little attention and most of the cars have the form of three or four speed gear box, which has served them for several years. The use of third direct and an indirect fourth gear, a feature of the last Flow, has but a few fresh adherents.

It was rumored that several Panhards of new and popular power would be shown, fitted with the epicyclic gear. This, for a well known French firm, would be sufficiently a novelty to cause comment, but the non-appearance of these cars makes it necessary to await the Paris show for further information.



Motor Shown by the Two-Stroke Engine Company, Ltd.

In spite of the flexibility of the six-cylinder engine, only one maker has been found to dispense with the gear-box. The 45-horsepower Sheffield Simplex has this feature to recommend it, but even here a reverse has, of course, to be fitted, and while arranging for this in the rear axle casing, the makers have thoughtfully added a low forward speed "for emergency use," so that the novelty of the step rather disappears. All the same this proceeding effects an appreciable saving both in weight and in the number of parts, and the increased simplification of the chassis is certainly surprising.

Several other makers—notably Napier in his smaller cars—have arrived at a similar result by moving the gear-box up to the engine, of which the flywheel is placed right forward against the radiator. As will be shown later, the Napier gives a very neat and simple car.

For the final drive, there can be no doubt but that the chain is dying out, except for the highest powers, and here again it only shares the honors with the shaft-drive. In its turn the shaft and

Chassis of the F. N.—A Well-known Popular Type.

bevel drive is rivalled in medium powered cars hy the worm drive, and another year will prohably show a hig advance in popularity of this last type, which, when well designed and cut, possesses such advantages over other forms of gearing as regards quietness and smoothness of action.

Almost all cars retaining the chain drive that are exhihited have well designed oil tight chain cases, a feature which at once removes the greatest objection to this form of drive.

In the rear axle itself the straight tooth or spur differential shows an increase in use, so that the hevel wbeel thus tends to disappear from motor car practice altogether.

But little change is apparent in frame design, which still adheres to the pressed steel form. What alteration has heen made is in the direction of lowering the height at the rear so as to accommodate the covered body, which increases greatly in popularity each year.

As a concluding feature, the popularity of the wire wheel on all types of car must be recorded. The wire wheel has always had several firm supporters, of which the Lanchester, that origin of so many new ideas, was perhaps the most prominent. Two years ago, however, the Rudge Whitworth detachable wire wheel opened up a new range and since then this more mechanical device has spread to an extent that may be judged from the fact that such firms as Daimler and Napier, along with a dozen others fit Rudge-Whitworth detachable wheels as standard on all models. It certainly requires some time before the eye becomes accustomed to the wire wheel, but once the novelty has worn off, its many advantages, including those of lightness and strength, greatly favor its general use.

With the known falling off in the demand for the larger powered cars and the big increase of competition in the smaller section, it was generally anticipated hy the puhlic that a general drop in prices would be manifested. This has not been the case and although in certain instances prices are slightly helow those of last season, the usual rule seems to have been to improve the details and so to keep the price up to its former level. By the introduction of new low-powered models, however, many of the biggest makers—such as Napier, Austin, Delaunay, Fiat—have now brought their productions within the reach of that immense section of the community, "the man of moderate means."

These small cars differ only in size and in detail finish from their bigger companions and the high class quality of work has heen retained to a big extent, so that a wide and excellent range is available for the choice of the purchaser.

A walk around the stands with an outside examination of the hetter known cars shows how completely fhe design of the higher powered vehicles has settled down to broad standard lines. There are, it is true, several notable exceptions, such as the new valveless Daimler and the gear-boxless Sbeffield-Simplex—tbough here again the exception is only in respect to one unit of the car—but with all others a description of one might he applied equally well to balf a dozen others.

Some of the British Cars at the Show.

For most visitors the first stand to be inspected will probably he that of the Daimler Company, which, by a curious coincidence, occupies the center position of the huilding. When two months ago the Daimler Company announced their intention of adopting the Knight valveless engine exclusively for the coming season, there was much criticism of their action, many helieving that the firm had been too precipitate in deciding to concentrate on these engines right away. Mr. Knight's descriptive paper before the Royal Automobile Cluh a few weeks ago and the publication of the results of extensive tests that have been made, have led most people to believe that this engine marks the commencement of a new era in motor construction—for in addition to demonstrating the advantages which such an engine offers for the four-cycle motor, the new engine has directed puhlic attention to the possibilities of tbe two-stroke motor, to which class the Knight engine was at first erroneously supposed to belong.

Four models of Daimler cars are heing shown, the 22-horsepower, 38-horsepower, 48-horsepower and 57-horsepower. All are of the new type, and, with the exception of the last, have four cylinders. The 57-horsepower six-cylinder car is stated to have been constructed primarily to fulfil a special order for the United States.

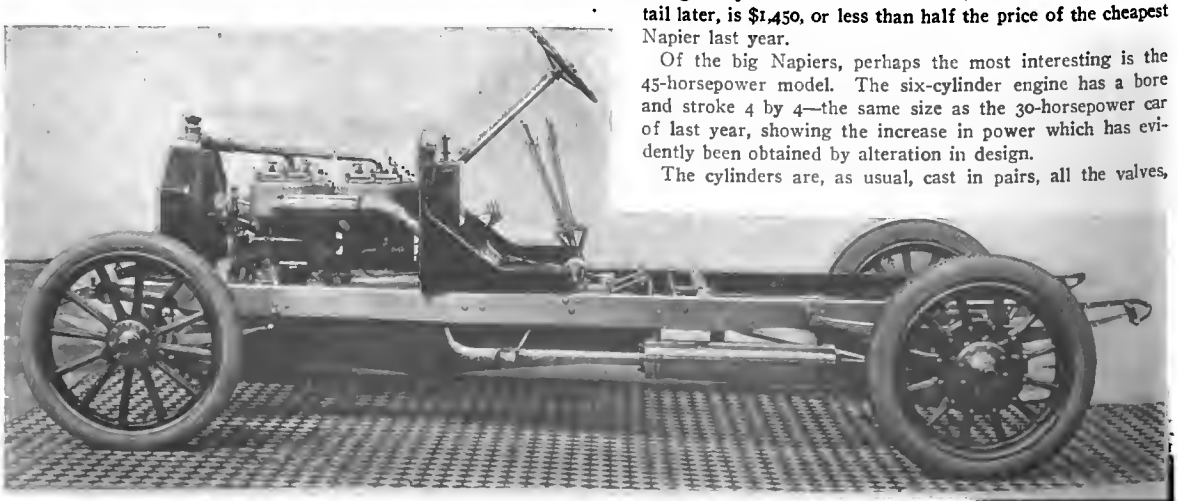
Once such staunch supporters of tbe chain, the Daimler Company bave now abandoned this drive on all cars, except the 48-horsepower model, shaft drive with bevel gearing being employed.

The pressed steel side frame members are parallel throughout and are connected by tubular cross memhers. Rudge-Whitworth wire wheels are fitted as standard on all models, but wooden artillery wheels will he substituted if the purchaser desires. The chassis prices of these cars range from $2,375 for the 22-horsepower to $4,000 for the 57-horsepower.

On the adjoining Napier stand much of novelty is likewise to be seen, though here there is not so much a radical alteration in design as the provision of new models in a section hitherto untouched by this maker. Always associated with the high-class six-cylinder car, the Napier name still applies to the several models of this type that are staged, varing in power from 30 to 90-horsepower. But, in addition to these, the popular 15-horsepower four-cylinder car attracts general attention, and also the 10-horsepower two-cylinder light car. The price of this last, possessing many features of interest which will he noted in detail later, is $1,450, or less than half the price of the cheapest Napier last year.

Of the big Napiers, perhaps the most interesting is the 45-horsepower model. The six-cylinder engine has a bore and stroke 4 by 4—the same size as the 30-horsepower car of last year, showing the increase in power which has evidently been obtained by alteration in design.

The cylinders are, as usual, cast in pairs, all the valves,



Effective and Solid Construction of the Chassis of the 45-60-horsepower Four-cylinder Op

whicb are interchangeable, being operated by the one camshaft. This in its turn is driven by helical gearing to reduce the noise. Tbe general elimination of noise of details in this way bas led to the adoption of "Noiseless Napier" as the title of the cars for next season.

The system of forced lubrication to every working part is the same as was used on last year's cars, and as any excess is taken from the well by the pump and restored to the tank, it would seem impossible for the engine to give trouble by smoking. The chrome-nickel crankshaft, with disc webs, runs in plain bearings. The comparatively small flywheel carries the flat disc clutcb and between this and the gear-box two separate Hooke's joints are interposed to insure absence of any binding due to momentary frame distortion.

The gear-box has three forward speeds and reverse, the layshaft and reverse pinion being at rest when top gear is engaged. The gear shafts are unusually large in diameter and as short in length as possible, and these factors, together with the intermediate ball bearing for each shaft, prevent any humming of the gears, which the firm contends is due in general to springing of the sbafts. The gears themselves slide on feathers solid with the shaft, instead of being on a squared shaft as formerly.

Behind the gear-box the foot brake is combined witb a ratchet sprag—a device now rarely met with—and this is linked up to the reverse lever to prevent any possibility of accident. In the rear live axle the two internal shafts have the driving gears integral witb them, the differential gears being of the straight tooth type.

The 30-horsepower model is the third of the series which includes the 10 and 15-horsepower cars. The cylinders, cast in pairs, have bore of 3¼ inches and stroke of 5 inches. The valves are all enclosed.* The remaining features are the same as those of last year's 30-horsepower car, with, however, the difference that a general lightening of parts has reduced the weight by no less than five hundredweight.

The 60-horsepower car is a bigger edition of the 45-horsepower having cylinders 5 by 5, while the 90 horsepower model, cylinders 6 by 5, is apparently a touring edition of the Grand Prix races, which were built for that contest but which never competed, owing to the barring of wire wheels by the French club. These wire wheels are standard on all Napier cars for 1909.

Further on, the Sheffield-Simplex is an example of several similar high class six-cylinder cars, but in itself it is remarkable in that it has no gear-box—in the usual sense of the word. The six-cylinder engine has its 4½ by 4½ cylinders cast in pairs, and the crankshaft is built in three pieces bolted together, a method of construction necessitated by the use of ball bearings. These bearings are of very big dimensions, ⅞-inch balls being used. Dual ignition is fitted, and the wires are in the form of a built-up cable with separate short leads to the plugs. The engine control is effected by a foot throttle pedal, sliding sideways. The movement is quite free, and as no pressure is required to keep the pedal in any particular position, great steadiness of running can be secured on the roughest of roads. The other foot pedal operates the clutch, and then, after a short neutral travel, the shaft brake. From the disc clutch the power is transmitted through a double universal joint to the real axle casing. Here, before tbe bevel pinion is reached, a short lay shaft is provided, which, in very compact form provides a low gear and a reverse. It is claimed that this low gear is never required, except for starting on the steepest of hills. The absence of the gear-box certainly improves the chassis, which presents a strikingly simplified appearance to the eye. Two views of the chassis are shown on page 732 of this issue THE AUTOMOBILE.

On many other stands British cars of known worth are staged, but as in most of these cases smaller models are manufactured with special details, consideration of these exhibits will be deferred till later.

*The disc clutch on this model is placed wtthin the gear-box, which latter is also extended to cover the foot brake.

The Two-seated Victoria Made by Alldays.

Some Distinctive Features of the American Exhibits.

The American firms that have established agencies over here are well represented at the show. In many cases the standard models have been slightly departed from to fall in more fully with British ideas, and agents are confident that the coming season holds out good business prospects for them. The White stand is always a center of attraction, for these cars are well known to British motorists and have quite a notable list of patrons. Rollin White was busy all day explaining numerous special points of interest of the new models, both the 15 and 40-horsepower types being shown. The many departures from previous White practice give additional interest. The frame is of pressed steel and the two forward cross members carry the engine, the weight of which thus comes behind the front axle. The short ball bearing crankshaft and the adoption of Joy's valve gear are further points of interest, and, altogether, the new Whites are certain to cause a big increase in the numbers of steam car owners over here.

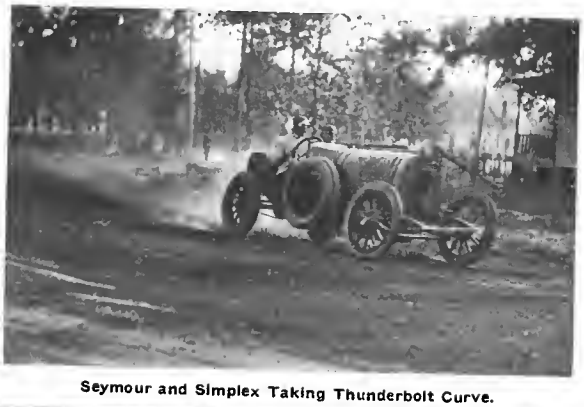
Another American exhibit to which much attention is being paid is that of the Cadillac cars. The name Cadillac has always been associated with the well-known single-cylinder vehicle which has behind it such an unvarying list of successes in reliability competitions, ending up with the famous standardization tests of this spring. Hence unusual interest is shown in the new 26-30-horsepower four-cylinder model which has just arrived. The spun brass jackets on the separate 4 by 4½ cylinders are noteworthy, as also are the separate combustion heads—a practice which in these days of accurate machinery might well be re-introduced generally. The circulation of the oil from one crank pit to the next is very ingenious and should prevent any fouling of the rear cylinders when hill climbing. The engine is ungoverned, but control is easily effected by the provision of both foot and hand throttles, as well as an interconnection of clutcb pedal and throttle to prevent any racing of the engine when gear changing. A similar interlocking arrangement prevents the clutch engaging till the gears are fully in mesh, a point which should reassure the novice. Taking the car right through, the general design and workmanship are such as to reflect great credit on the Cadillac firm, and a good seaosn might safely be predicted for it.

The popular Ford cars are shown both in the 15-18 four-cylinder type, which is practically unaltered from last year, and in the new and distinct 2024 horsepower. Like the British Deasy mentioned before, the cylinders of the new Ford are cast in one block integral with the top half of the crankcase. The enclosed flywheel and epicyclic gears, all running in oil, are points of special note. The low tension magneto, combined with the fly wheel is also a novelty and should give a powerful spark and efficient firing at low speeds.

Many American firms—Rushmore, Goodrich, Stewart & Clark, Jones, and others—are to be found in the accessory section.

Renault, Szisz Driving, Passing Grand Stand.

Haupt in Chadwick, at the Thunderbolt Curve.



Seymour and Simplex Taking Thunderbolt Curve.

National, with Harding at Wheel, Rounding Curve.

ALL READY FOR SAVANNAH RACES.

SAVANNAH, GA., Nov. 23.—As the day of the great race draws nearer Savannah is giving itself up more wholly than ever to the celebration of this, the greatest event in her modern history. The business section of the city is hung with Automobile Club of America colors, and most of the cars about town bear the club's bannerettes. Savannah's whole heart is in this race, and no one would so abuse hospitality as to intimate that the coming contest is not to be the greatest ever run in this or any other country.

Savannahians have above all an ambition that Thursday will see a new world's record set up. It is hard to convince them that with nineteen right-angle turns on the course, with several stretches of pretty rough going for racing cars, and the stops necessary for tire changes and fuel replenishment in so long a contest as 400 miles, it is unreasonable to expect an average rate as fast as 70 miles per hour.

There has been a lengthening of the course some eight miles, some curves have been softened, and turns have been banked. The magnificent 3½-mile Ferguson avenue stretch has been added, which will admit of unlimited speed, but after all there remains but this and the homestretch as the only portions available for any continued high speed. Single laps have been made at 70 miles an hour rate, but it is not to be expected that this should be maintained. If the Locomobile's Vanderbilt course average of 64.3 miles be beaten, the Savannahians should be well satisfied.

The banking of the turns has been a disappointment to the foreign drivers for two reasons. In the first place they are accustomed to skid around turns, and again the turns rise at the start and slope at the finish. The drivers say that this should have been reversed. It is also suggested that objection to any figures made standing as a road record may be made on the ground of the route being thus a specially prepared course, whereon actual road conditions are not encountered.

The Savannahians have spared no expense and left no stone unturned to improve on their excellent arrangements and management of last Spring. They have built a new and larger press stand, and erected west of the old stand a new stand with a seating capacity of ten thousand. The capacity of the old stand was also increased to 6,000. Eleven telephone stations have been established, connected with the score boards facing the grandstands and parking spaces. Along the front of the old stand, which is really the grandstand, the new stand being in the bleacher class, supply pits have been dug. Another supply station has been established at the head of Ferguson avenue, which is solely for tire supplies.

The troops have been ordered on duty by the adjutant-general. They number 500 and will be in command of Major W. P. Stephens. The course will be patrolled by 134 flagmen. One hundred and fifty men are at work on the course every day.

A great crowd is expected from neighboring States and cities. All the southern railroads have been selling excursion tickets with coupons attached, good for a seat on the new stand and exchangeable at one dollar on account of grandstand seats, which are sold for $3 for the two days. No single day grandstand seats are sold. Boxes seating six sell for $50. The Northerners have chosen the west end of the stand.

Chatham county has borne the expense of building the new roads, and the City of Savannah has resurfaced the roads within the city limits. The Savannah Automobile Club erected the grandstands and telephone line and will pay the flagmen. The profits of the race will go to the advertising fund of the city. The Automobile Club of America will not receive any of the race receipts, though at different times it is reported to have received appropriations amounting to $7,000 toward the cash prizes and other purposes. All other expenses attendant on the conduct of the race itself, relating to publicity and the contest committee and the cost of the $5,000 Gold Cup, are borne by the New York club.

Two serious accidents have marked the preliminary practice, one fatal and the other also possibly with death as its outcome. On Friday as the S. P. O. was speeding up the White Bluff road, John Juhasz, its driver, in trying to avoid a dog, swerved to the side of the road, gouged a big piece out of a tree, and then dashed into a telegraph pole. The crew was hurled from the car. Marcus De Rosa, the mechanic, had a fractured skull and other injuries and died shortly after reacbing the hospital. Juhasz escaped with bruises. The car was not, however, hopelessly wrecked. It is now at a repair shop with hopes of its still being able to take part in the light car race with either Phil. Adams or Connors, who was Stricker's mechanic in the Vanderbilt race, as its driver.

The other accident occurred in front of the Buiek camp during Wednesday's practice. Robert Burman was driving a light Buick, when its left rear tire blew out. The car skidded into a telegraph pole and was completely wrecked. The mechanic, Joe Grinnan, had his skull, elbow, and six ribs broken. One rib punctured his lung and pneumonia has set it. Burman escaped without injury.

All hands, both European and American, are well equipped in the matter of camps. All the foreign training quarters are located at points along the course. Three of the Americans have suburban establishments, the others making their headquarters at the local garages, where they have adequate shop facilities already at hand, the Acme and the Lozier having the most pretentious outfits, and the Buick having a shop alone by the trackside.

The Acme occupies the same quarters at Bonabella on La Roche avenue as it did last spring. A commodious cottage belonging to Robert Saussy lodges the camp captains and crews. A big boathouse by the riverside has been turned into a shop and garage. The eommander of the camp is C. H. Tucker, sales manager of the company. With him are Frank Clemmer, engineer; Ed. Lengel, head tester, and "Doc" Harry Fricburg, mechanic. Len Zengle, driver, and Charley Gross and Moses Saxon complete the force. The Acme stock ear racer, a seven-passenger touring car, and a runabout are the artillery force outside of the Grand Prize racer itself.

Prior's Woodlawn Villa, quite a pretentious estate on the White Bluff road, has been leased outright by Harry Lozier. A barn has been converted into a shop. C. A. Emise, salcs manager, who is in command, has Mrs. Emise and two children with him. Harry Michener, driver, Ralph Mulford, substitute, and Tom Lynch, mechanic, are noteworthy members of the force. Mr. Turcott is here from the Plattsburg factory in eharge of the mechanical force. In addition to the new racer, a Briarcliff model touring car is available for studying thc course.

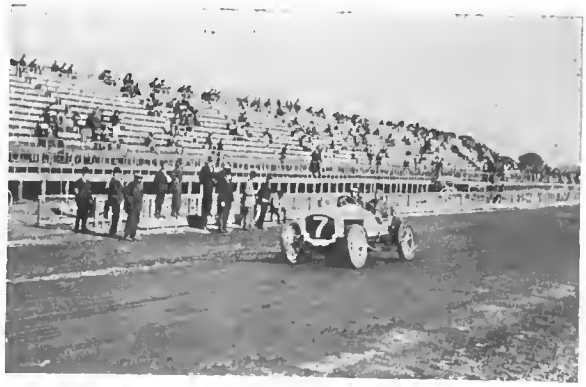
W. L. Marr, designer, has pitched the Buick camp a half mile out the White Bluff road. A building fully equipped as a shop and garage has been erected. John Hancock, superintendent of the factory, is with him. Ten mechanics are under their orders, in addition to Robert Burman, Ewing Easter, and Earl Jeffers, the drivers. C. A. Hearne, who is to drive his own ear, also has his mechanic at the camp.

The Simplex is stored at the Southern Automobile Company's garage, across the street from the De Sota. Joseph Seymour, the driver, and T. M. Pepperday, his mechanic, are in full charge.

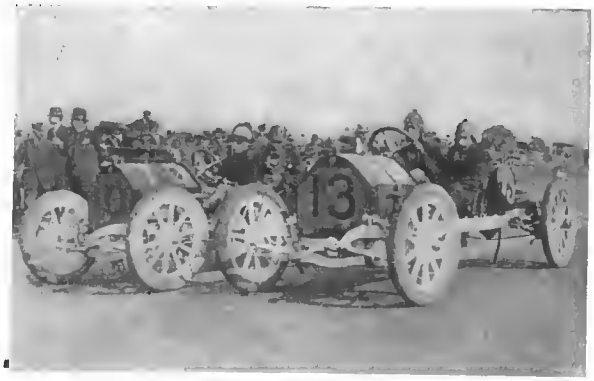
Carl W. Kelsey, sales manager, has leased a shop at 214 East Broughton street. Three mechanics from the factory will also serve in that eapacity for Arthur See, Joseph Munweller, Thomas Costello, and Mr. Kelsey himself, who will be the pilots of the Maxwell "mosquito fleet." The fourth mechanic will be a local man. Mr. Kelsey maintains military discipline, heading the procession to and from the course. He also insists that each man walk for an hour before breakfast to assure his physical condition.

The Chalmers-Detroit light car outfit has established its headquarters at Bryam's garage, in command of G. G. Behn, assistant

Michener in Lozier on Course at Isle of Hope.



Zengle Takes His Acme Past the Big Grand Stand.



Two Chalmers Detroit Candidates for Small Car Race.

Lancia "Lampo" with Driver Hilliard at the Wheel.

chief engineer. Lee Councilman, sales manager, is also on hand. Mr. Ford, the new advertising manager, and Carl H. Page, New York agent, are expected to-morrow. L. B. Lorimer and W. R. Burns have had out No. 10 and No. 13 each day for practice. L. J. Bergdoll, the Philadelphia agent, is still awaiting his car.

President A. C. Newby, of the National Motor Vehicle Company, has his six-cylinder at the Graham Automobile Company's garage, next door to the Pulaski. W. G. Wall, chief engineer, arrived to-day to take charge. G. A. Weideley, designer of the Premier, and Carl Fisher, of Indianapolis, came with him. Hugh N. Harding, who drives the car, is much in evidence.

F. T. Cameron did not arrive with the Cameron until last night. The committee received a telegram to-day, stating that the American Aristocrat would not be here to start.

Paul LaCroix has pitched the Renault camp at Barbee's at the Isle of Hope. The Italas are at Mrs. Hires' in the same district, where Henry Fournier receives many calls.

The Lancia camp is located at Castle Park on La Roche avenue. W. M. Hilliard, who will drive the "Lampo," is in charge, pending the arrival of President C. H. Tangeman, of the Hol-Tan Company to-morrow.

The S. P. O. is next door neighbor to the Lancia. The car, however, is now at Byram's garage, being repaired in the hope of its being able to start on Wednesday, with Paul Adams as its driver.

The Benz is at the German Club, and the Clement, De Dietrich, and Fiat at Thunderbolt.

Willie Haupt and the Chadwick are quartered at Police Headquarters. L. S. Chadwick, president, and H. B. Larzelere, sales manager, of the Chadwick Engineering Works, are in charge.

Heavy Attendance of Trade and Press.

Indications point to a large attendance of men prominently connected with the sport and industry, despite the remoteness of the week of the race. The trains and steamers all during the week have brought considerable contingents. To-day's arrivals showed a large increase in the number of early comers. Among them newspaper men were much in evidence. Among those already here are: Sullivan, *Herald;* Wolff, *Tribune;* Wetmore, *Evening Mail;* Gerrie, *Times* and *World;* Johnson, *Sun;* Meegan, *Telegraph;* and Curry, *American,* of New York; Kerrison, *American;* Reynolds, *Post,* and McNamara, *Herald,* of Boston; White, *Evening Times,* of Philadelphia, and Small, *Associated Press.*

Some of the tradesmen on hand are: William Du Cros, Dunlop Tire Company, London; J. C. Matlack and J. Wilbur Hobbs, Michelin Tire Company; J. C. Cockran, Continental Caoutchouc Company; S. H. Jacobs, Pennsylvania Rubber Company; George A. Weideley, Premier Mfg. Co.; C. A. Emise, Lozier Motor Company; Arthur Gruner, Chicago; Carl Fisher, Prest-O-Lite Company; L. S. Chadwick and H. B. Larzelere, Chadwick Engineering Works; Lee Councilman, Chalmers-Detroit Company; A. C. Newby, National Motor Vehicle Company, and C. W. Kelsey, Maxwell-Briscoe Motor Company.

Who the Starters Are, and the Weights Carried.

The following is a list of the starters in both races with the drivers, mechanics, and weights of the cars:

GRAND PRIZE RACE.

No.	Car.	Driver.	Mechanic.	Weight in Pounds.
1.	Clement-Bayard	Victor Rigal	Charles Gilbert	2775
2.	Lozier	Harry Michener	Tom Lynch	3075
3.	Simplex	M. J. Seymour	Tom Pepperday	3325
4.	Buick	Robert Burman		2700
5.	Chadwick	Willie Haupt	F. J. Breimer	2950
6.	Fiat	Felice Nazarro	F. Tagnano	2750
7.	Acme	Leonard Zengle	H. W. Freiberg	2500
8.	Benz	Victor Hemery	Gill	2925
9.	Lorraine-Dietrich	Arthur Duray	Mattbys	2875
10.	Renault	Francois Szisz	Martand	2525
11.	National	Hugh N. Harding	C. S. Kellum	2750
12.	Itala	Alexandre Cagno	Moriondo	3150
13.	Clement-Bayard	Hucian Hautvast	Chassangne	2700
14.	Fiat	Louis Wagner	Ferro	2750
15.	Benz	Rene Hanriot	Heim	2925
16.	Renault	Louis Strang	C. Anderson	2550
17.	Itala	Henry Fournier	Riva	3275
18.	Fiat	Ralph DePalma	Bordino	2775
19.	Benz	Fritz Erle		2875
20.	Itala	Giovanni Piacenza	Cosso	3300

SMALL CAR RACE.

No.	Car.	Driver.	Mechanic.	Weight in Pounds.
1.	S. P. O.	Herbert S. Conners		1984
2.	Lancia	W. M. Hilliard	Frank Strobel	2000
3.	Chalmers-Detroit	L. J. Bergdoll	Charles Howard	1900
4.	American Aristocrat	K. R. Manville		....
5.	Cameron	F. I. Cameron	J. J. White	1125
6.	Isotta	Al. Poole	W. Fehr	1500
7.	Gregoire	George Robertson	Glen Ethridge	1500
8.	Buick	R. Burman		1500
9.	Maxwell	A. See	Carter	1525
10.	Chalmers-Detroit	L. B. Lorimer	J. H. Stickney	1900
11.	Buick	E. A. Hearne	J. Tower	1475
12.	Maxwell	T. Costello	J. R. Cleland	1175
13.	Chalmers-Detroit	W. R. Barns	R. R. Gareau	1900
14.	Buick	E. Easter	F. A. Thompson	1500
15.	Maxwell	J. Munweiler	Michelson	1125
16.	Buick	Earl Jeffers	W. C. Mahoney	1550
17.	Maxwell	Carl W. Kesley	H. Cawood	1450

STRICKER LAID AT REST IN NEWARK.

Funeral services over the remains of Emile Stricker, who was killed during the twenty-four-hour race at Birmingham, Ala., Tuesday, November 17, were held at the quarters of the Professional Chauffeurs' Club of America, 158 West Sixty-fifth street, New York City, at ten o'clock Friday morning. The body was taken to Newark, N. J., in the afternoon and placed in the receiving vault in Fairmount cemetery, to await further instructions from abroad. Prior to the services a special meeting of the Chauffeurs' Club, of which Stricker was a charter member, was held and the following resolutions on his death were passed:

Whereas, Our beloved brother, Emile Stricker, has been suddenly removed from our midst by the divine hand of Providence, to the great sorrow of his relatives, many friends and fellow club members; be it

Resolved, That we, the members of the Professional Chauffeurs Club of America, tender our sincere sympathy to the bereaved family of the deceased and hereby express our deep appreciation of his sterling qualities and marked ability, and regret the personal loss which each member of this club has sustained by the death of our friend and fellow member; and be it further

Resolved, That these resolutions be printed in the official organ of this club, the "American Chauffeur," and that copies of the resolutions be sent to the family of the deceased, also spread upon the minutes of this club.

GOOD ROADS MEN MEET IN INDIANA.

INDIANAPOLIS, IND., Nov. 23.—Advocates of good roads from all parts of the State will meet here to-morrow night for the purpose of organizing the Indiana Bureau of Good Roads into a permanent association. The meeting will be presided over by R. A. Brown, temporary chairman, until officers are elected.

The meeting will be held in the assembly room of the Board of Trade building, and it is expected that automobile owners, farmers, rural mail carriers and others interested in good roads, will attend. There will be addresses by W. G. Blatchley, State geologist; W. H. Roberts and John Mendenhall, county commissioners, and Clarence Kenyon, who made a special study of highway construction in Europe during the last summer.

The bureau believes that a better system governing road construction should be adopted. To this end it will ask the Legislature to create a State Highway Commission.

At this time road building is accomplished by very unsatisfactory methods, without regard for the season when it should be done. Farmers are authorized to haul gravel on the roads at $3 a day, the amount being allowed on their taxes. As a result they haul gravel when they have nothing else to do and merely dump it in the middle of the road.

It is probable the Legislature will be asked to give the highway commission a liberal appropriation to carry on the work.

BENEFITS DERIVED BY HEAT TREATING STEEL

By THOMAS J. FAY, President Society of Automobile Engineers.

THE latter day practices of the makers of automobiles take into account, primarily, material soft enough to be worked on a commercial basis. Since the materials have to serve for divers purposes, they have to be rendered hard or dynamic and in other states, depending upon the service. It is possible to start in with certain selected grades of steel, initially soft, but susceptible of transformation, if heat treatment is resorted to. In this article an attempt will be made to expose to view some of the methods by which initially good steel may be readily fashioned into shape and thereafter rendered hard or soft, ductile or dynamic, as the exigencies of the service may demand.

of the variations, and it may serve to indicate the desirability for system and a well-defined uniformity in practice.

It is not claimed that all the "heat treatments" given in the tabulation will be found valuable for use; on the other hand, the contrary will be found true. It is the idea to afford a wide range of specific forms of heat treatment, and in so far as it is possible to do so, extend proof of the value or otherwise of the several modes of treatment.

It will be understood tbe treatment proper for one grade of steel would be fatal for another. It follows that there may be grades of steel demanding some one of all the formulæ given

THE RANGE OF TEMPERATURES FOR THE SEVERAL TREATMENTS OF STEEL.

No.	Description.	Quencb. Temp. deg. C.	Anneal. Temp. deg. C.	Quench. media.	Anneal. media.
A.	Annealing		850	Lime	
B.	Annealing		750	Lime	
C.	Annealing		800	Lime	
D.	Annealing		850	Lime	
E.	Annealing		900	Lime	
F.	Annealing		950	Lime	
G.	Annealing		1,000	Lime	
H.	Annealing		1,050	Lime	
I.	Annealing		1,100	Lime	
J.	Cementing and Tempering.	800	250	Water	Bismuth
K.	Cementing and Tempering.	850	250	Water	Bismuth
L.	Cementing and Tempering.	900	250	Water	Bismuth
M.	Cementing and Tempering.	950	250	Water	Bismuth
N.	Cementing and Tempering.	800	300	Water	Lead
O.	Cementing and Tempering.	850	300	Water	Lead
P.	Cementing and Tempering.	900	300	Water	Lead
Q.	Cementing and Tempering.	950	300	Water	Lead
R.	Hardening	750		Water	
S.	Hardening	800		Water	
T.	Hardening	850		Water	
U.	Hardening	900		Water	
V.	Hardening	950		Water	
W.	Hardening	1,000		Water	
X.	Hardening	1,050		Water	
Y.	Hardening	1,100		Water	
Z.	Hardening	750		Oil	
AA.	Hardening	800		Oil	
AB.	Hardening	850		Oil	
AC.	Hardening	900		Oil	
AD.	Hardening	950		Oil	
AE.	Hardening	1,000		Oil	
AF.	Hardening	1,050		Oil	
AG.	Hardening	1,100		Oil	
AH.	Hardening and Tempering.	750	250	Water	Bismuth
AI.	Hardening and Tempering.	800	250	Water	Bismuth
AJ.	Hardening and Tempering.	850	250	Water	Biemuth
AK.	Hardening and Tempering.	900	250	Water	Bismuth
AL.	Hardening and Tsmpering.	950	250	Water	Bismuth
AM.	Hardening and Tempsring.	1,000	250	Water	Bismuth
AN.	Hardening and Tempering.	1,050	250	Water	Bismuth
AO.	Hardening and Tempering.	1,100	250	Water	Bismuth
AP.	Hardening and Tempering.	750	250	Oil	Biemuth
AQ.	Hardening and Tempering.	800	250	Oil	Bismuth
AR.	Hardening and Tempering.	850	250	Oil	Bismutb
AS.	Hardening and Tempering.	900	250	Oil	Bismuth
AT.	Hardening and Tempering.	950	250	Oil	Bismuth
AU.	Hardening and Tempering.	1,000	250	Oil	Bismuth
AV.	Hardening and Tempering.	1,050	250	Oil	Bismuth
AW.	Hardening and Tempering.	1,100	250	Oil	Bismutb
AX.	Hardening and Tempering.	750	300	Oil	Lead
AY.	Hardening and Tempering.	800	300	Oil	Lead
AZ.	Hardening and Tempering.	850	300	Oil	Lead
BA.	Hardening and Tsmpering.	900	300	Oil	Lead
BB.	Hardening and Tempering.	950	300	Oil	Lead
BC.	Hardening and Tempering.	1,000	300	Oil	Lead
BD.	Hardening and Tempering.	1,050	300	Oil	Lead
BE.	Hardening and Tempering.	1,100	300	Oil	Lead
BF.	Hardening and Tempering.	750	350	Oil	Oil
BG.	Hardening and Tempering.	800	350	Oil	Oil
BH.	Hardening and Tempering.	850	350	Oil	Oil
Bl.	Hardening and Tempering.	900	350	Oil	Oil
BJ.	Hardening and Tempering.	950	350	Oil	Oil
BK.	Hardening and Tempering.	1,000	350	Oil	Oil
BL.	Hardening and Tempering.	1,050	350	Oil	Oil
BM.	Hardening and Tempering.	1,000	350	Oil	Oil
BN.	Hardening and Tempering.	750	550	Oil	Salts
BO.	Hardening and Tempering.	800	550	Oil	Salts
BP.	Hardening and Tempering.	850	550	Oil	Salts
BQ.	Hardening and Tempering.	900	550	Oil	Salts
BR.	Hardening and Tempering.	950	550	Oil	Salts
BS.	Hardening and Tempering.	1,000	550	Oil	Salts
BT.	Hardening and Tempering.	1,050	550	Oil	Salts
BU.	Hardening and Tempering.	1,100	550	Oil	Salts
BV.	Hardening and Tempering.	750	300	Water	Lead
BW.	Hardening and Tempering.	800	300	Water	Lead
BX.	Hardening and Tempering.	850	300	Water	Lead
BY.	Hardening and Tempsring.	900	300	Water	Lead
BZ.	Hardening and Tempering.	950	300	Water	Lead
CA.	Hardening and Tempering.	1,000	300	Water	Lead
CB.	Hardening and Tempering.	1,050	300	Water	Lead
CC.	Hardening and Tempering.	1,100	300	Watsr	Lead
CD.	Hardening and Tempering.	750	350	Water	Oil
CE.	Hardening and Tempering.	800	350	Water	Oil
CF.	Hardening and Tempering.	850	350	Water	Oil
CG.	Hardening and Tempering.	900	350	Water	Oil
CH.	Hardsning and Tempering.	950	350	Water	Oil
Cl.	Hardening and Tempering.	1,000	350	Water	Oil
CJ.	Hardening and Tempering.	1,050	350	Watsr	Oil
CK.	Hardening and Tempering.	1,100	350	Water	Oil
CL.	Hardening and Tempering.	750	550	Water	Salts
CM.	Hardening and Tempering.	800	550	Water	Salts
CN.	Hardening and Tempering.	850	550	Water	Salts
CO.	Hardening and Tempering.	900	550	Water	Salts
CP.	Hardening and Tempering.	950	550	Water	Salts
CQ.	Hardening and Tempering.	1,000	550	Watsr	Salts
CR.	Hardening and Tempering.	1,050	550	Water	Salts
CS.	Hardening and Tempering.	1,100	550	Water	Salts
CT.	Hardening and Tempering.	750	550	Water	Salts
CU.	Hardening and Tempering.	800	650	Water	Salts
CV.	Hardening and Tempering.	850	650	Water	Salts
CW.	Hardening and Tempering.	900	650	Water	Salts
CX.	Hardening and Tempering.	950	550	Water	Salts
CY.	Hardening and Tempering.	1,000	650	Water	Salts
CZ.	Hardening and Tempering.	1,050	650	Water	Salts
DA.	Hardening and Tempering.	1,100	550	Water	Salts

There are dozens of detailed ways of heat-treating steel, but the principal remains the same in all, differing perhaps as respects temperature and time, calling into play the influences of quenching baths, and the effect of varying rates of time, in heating and quenching. The above tabulation will suggest some

under some one of the several likely conditions. It is better to afford a diversity of formula, rather than to restrict the same, merely to court brevity. The table in question, in itself, offers no suggestion of the exact treatment to use in any given case nor does the same table include every possible treatment.

The table, together with some data on the subject, should, however, materially aid in the process. It is by far better to be able to identify the respective modes of procedure in some way, than to go about it haphazard. As regards the steel itself, there are several points that can be taken as more or less fixed, viz.:

(1) Steel for "cementing" (case hardening) may be alloyed or not, but it should be low in carbon. If the same is alloyed, the carbon sbould be lower than if the steel were of the carbon-steel genus.

(2) Iron almost devoid of carbon may be case-hardened (cemented), but the time required to grow a depth of carbon will, of course, be comparatively great in iron or in mild steel.

It will be to no purpose to attempt to improve upon the language of "Harboard"* in his definition of "tempering," viz., "The hardness conferred upon steel by rapid quenching is not suitable for any induetrial purpose, and has to be modified or 'tempered' to suit the particular requirements of the case. This may be done by rebeating the hardened (quencbed) steel to different temperaturss. The operation of tempering may tberefore be defined as modifying the degree of hardness conferred upon steel by quenching, by heating to certain definite temperatures, and slowly or rapidly cooling. Tempering reduces the brittieness and the hardness and considerably increases the toughness and ductility of the materials, and by varying the conditions of heat treatment almost any required degree of hardness may be produced."

In annealing steel it will be well to remember that the process will be moet beneficial as a rule if the steel is heated to a point above Ar_1 by a margin of about 30 degrees C. in eome grades, a matter depending upon the carbon contsnt.

*Harboard: The Metallurgy of Steel, p. 641, Sec. Ed.

Cementing steel is also a product singularly free from impurities when the results are noteworthy.* Krupp cementing steel, for illustration, rarely has more than ten points of carbon, no matter what the other components may be. Tbis is provided the steel is for "cementing." In this steel the sulphur and phosphorus are both held very low, indeed, and the manganese does not exceed 0.50 per cent. What is meant by low sulphur and phosphorus is something to define in view of the great diversity of opinion of this phase of the subject.

Sulphur Limitations (in automobile work):

0.010 = a very satisfactory low limit;
0.015 = a moderately satisfactory point;
0.020 = the top limit for capital results.

Phosphorus Limitations (in automobile work):

0.010 = a very satisfactory low limit;
0.015 = a moderately satisfactory point;
0.020 = the top limit for capital results.

It is not impossible to use steel if the sulphur and phosphorus are in excess of the top limits given, but the idea here is to fix the range of desirable contents. In heat-treated steel there are many things to conspire against the user of inferior steel, and the chances of ill results are so great as to demand the use of none but the finer grades of steel.

The silicon should, in most cases, be low as well; in fine, it seems, the nearest approach to pure iron plus the alloying elements, would best serve the purpose. Then the carbonizing process may be conducted under conditions of the greatest possible safety and the "failures" will be few and far between. The usual object in cementing is to attain extraordinary results, hence it would seem as if the steel should be of extraordinary quality. Indeed, it is true of steel that the "metalloids"† should be as low as possible anyway, whether the steel is for case-hardening or not. If steel is not to be "cemented" and it is desired to render the same hard by quenching, the carbon must then be higher (than that in cementing steel) by a considerable amount. In carbon steel, it is true, that if the carbon is below 20 points, there will be no appreciable increase in hardness as the result of quenching from even very high temperatures. Obviously, then, the carbon must be above 20 points if the hardness is to be due to the effect of quenching.

If the carbon is up to about 40 points, quenching will result in a very considerable hardness, while if the steel holds nickel, chromium, tungsten or vanadium, the hardness will be more pronounced. If, on the other hand, great hardness is demanded, from strictly carbon steel, the carbon should be even up to 90 points. If the steel is to be tough as well as hard it is a matter of oil quenching and subsequently tempering. Water quenching alone results in great hardness, but the steel would be brittle. Subsequent tempering would reduce the brittle character of the steel, while oil treatment imparts far greater toughness.

The carbon content then sbould be fixed higher for carbon steel than would be required for alloy steel, if the hardness is to be as a result of quenching and subsequent annealing, rather than by the cementing process. There are some practices to be condemned in connection with the hardening of steel (especially alloy steel), as, for illustration, the use of cyanide of potassium. It is not well to raise the temperature of one end of a piece of steel to a point high enough to engender hardness as a result of quenching after immersing the same in the cyanide. If one part is raised to a high temperature, and the other part is kept at a lower temperature (black), the result is, a zone between the hardened and the soft parts which is neither one or the other of the conditions that should obtain. The cyanide of potassium seems also to be incapable of imparting a safe hardness to the steel unless the steel itself is very low in carbon and free from alloys. In that event the depth of the hard skin is but microscopic and of no value in actual practice.

It is not uncommon to see camshafts with cams hardened by applying the flame of a "bunsen burner" to the cams, raising the heat to a high point (how high no one knows), then the cyanide is daubed over tbe heated surfaces and the quench is applied. It is plain enough that the purchaser of an automobile who has cams thrust upon him (hardened in this way) will not be afforded an insight to the fact in the "elusive" literature of the publication department of the makers of such automobiles.

The structure intervening a hard and a soft layer may be good and it may not. It is satisfactory in the cemented work, if the steel is primarily a low-carbon product. It is not satisfactory if the whole of the member is not raised to the same temperature. It is not proper to heat one end of a member and leave the other end cold. There is a junction of the two conditions that will not be equal to the other portions of tbe member in point of hardness, on the one hand, and of strength on the other.

From these crude methods of spoiling steel (in the attempt to harden it) to the most approved methods of heat treating is a long way. What is wanted for the most signal success is a complete equipment knowledge of its use, and the requisite qualities of the steel.

Required Equipment for Heat Treating.

(1) Exact means of determining the temperature.
(2) Suitable means of attaining any temperature up to 1,400° C.
(3) Exact means of maintaining a constant temperature for long periods of time.
(4) Means for quickly adjusting the temperature and changing the same.
(5) Means for protecting the steel to be treated from contact with objects that would tap the heat and render the temperature uneven.
(6) Means for slowly raising the temperature of the parts to be heat treated.
(7) Means for slowly cooling the parts to be heat treated.
(8) Means for quickly lowering the temperature of the parts to be heat treated.
(9) Suitable tools for deftly handling the parts without exposing them to air, or to such outside influences as would abort the desired action.
(10) Arrangements of the equipment such as would protect the manipulator from the poisonous fumes of the chemicals used in the process.
(11) An adequate forging plant.

In general there are two main methods of proceeding with the heat-treating process. The first is the one in which the parts to be treated are exposed to the burning gases and the atmosphere to a certain extent, and, the second, is a process by which the parts are submerged in a media of metallic salts, and the whole is raised to the desired temperature. In this way the parts to be treated only contact with the salts and the temperature is held quite uniform throughout the mass. The salts protect the steel from contact with the air or gases during the process. Of the two methods, the second is much to be preferred, yet even so, it is the method least used.

Muffle furnaces belong to the first method of heat treating, in which coal-gas is used as the source of heat. They work very well, indeed, and a good manipulator can deliver splendid product as a result of their deft use. It is not possible to protect tbe steel, however, from contact with the products of combustion, and it is not easy to uniformly heat the steel throughout its section, especially if the parts are bulky. It cannot be said tbe muffle furnace temperature may be measured with great accuracy, nor will one be sure that the temperature of the parts to be treated, will be the temperature as shown by the "pyrometer."

The pyrometer only contacts with the hot gases and not with the parts to be hardened. On the whole, however, the work done by the muffle furnace in the hands of a skilled manipulator is not to be harshly criticised, because the results are truly good. Certainly, the muffle furnace is a vast improvement over an open fire of any kind. It is also a fact that the muffle furnace is superior to a "bunsen burner," by means of wbich a hot blast

*Freid Krupp A. G. Essen un Ruhr.
†Sulphur and phosphorus are classed as metalloids.

is directed against tbe parts to be heated. Surely, this is not the way to realize good results. Certainly, it is not possible to maintain uniformity, if a bunsen flame is applied to one side of a piece and the other side is exposed to a cold draught.

The muffle furnace has the advantage of affording an indirect and uniformly heated atmosphere. This atmosphere does not seem to hold in its composition, elements or conditions such as tend to destroy the structure of the steel. On the other hand, it is not to be said that the atmosphere of the muffle furnace is the best possible. The exact atmosphere of the muffle furnace cannot be stated because the condition is one of partial combustion interstratified with the products of combustion. The coal-gas itself is a considerable variable, but it might approximate the composition as follows:

PRINCIPAL CONSTITUENTS OF COAL GAS.

Formulæ.	Names.		Volumetric per cent.
H	Hydrogen		25 to 50
	Light carburetted hydrogen		35 to 52
C_2H_2	Acetylene	Convertable Hydro Carbons	3 to 20
C_3H_6	Propylene		
C_4H_8	Butylene		
C_4H_4	Acetylene	Carbureters	?
$C_{10}H_8$	Napthalene		
CO_2	Carbonic acid		0 to 2
CO	Carbonic oxide		0 to 2
CN	Caynogene		5 to 9
NH_3	Ammonia		0 to 0.06
CS_2	Bisulphate of carbon		to 0.004
H_2O	Aquous vapor		to 2.5
N	Nitrogen		to 8
P	Phosphorus		trace.

Carbonic acid, carbonic oxide and water would constitute the chief products of combustion, the carbonic oxide would, of course, only be present if the combustion were incomplete. The nitrogen would remain as such (inert) and to these products must be added the atmospheric air requisite to dilute the gas for burning.

It has not been claimed by many who have taken an interest in the question of heat treatment of steel tbat the contact of the heated steel with the products of more or less complete gaseous combustion would lead to any ill results. That the steel will be in a more or less receptive state is not to be denied, hence it is a matter not to be entirely disregarded, this question of the contact of the steel with the atmosphere in which it is heated.

The more recent experiments on the subject tend to indicate that the atmosphere in which the steel is raised to a high temperature, does influence the situation in more ways than one. Nitrogen, for illustration, seems to increase the penetration of carbon. If parts to be cemented are packed in cementing materials and an excess of nitrogen is constantly supplied in any suitable way, the penetration of carbon will be to a greater depth in a given time.

The Influence of Nitrogen Upon Cementation.

If the cementing materials are high in nitrogen, the same results will follow, to a less extent, in all probability. If, however, it can be shown that nitrogen increases tbe penetration of carbon in steel at a cementing temperature, this is equal to saying the gas atmosphere in contact with the incandescent steel will influence the results, for good or ill. If we do not know the extent of the changes that may result, we do not know if the changes are beneficial or otherwise.

Under such conditions it is the safest to eliminate the atmosphere if it can be done with safety. It is not always the case that carbon is to be imparted to the steel, and on some occasions increasing the carbon content is far from the right thing to do. The most approved method of beat treatment of steel must be that in which the steel is submerged in a media of the most beneficial sort. In this way the steel is protected from contact with all but the desired contact media. This summary of the investigations of G. Shaw Scott was reported in the *Horseless Age*, Feb. 12, 1908, and while it cannot be regarded as conclusive and final, it is nevertheless pertinent, and normal to general expectations in this work.

"G. Shaw Scott, of Birmingham University, in a paper read before the Iron and Steel Institute of Great Britain, sbows the influence of nitrogen upon the penetration of carbon into iron or steel in the process of carbonization or cementation. The mixtures employed in cementation by various manufacturers are very numerous, including coke potassium ferrocyanide potassium cyanides, hydrocarbon vapors, bone, animal horn, graphite, burnt leather, animal black, barium carbonate, etc., either alone or in combination, each maker having a different formula. In every mixture used nitrogen exists under some form or other, however.

Mr. Scott took a certain number of identical bars of soft steel and subjected them to cementation with various mixtures and under given conditions. The bars were then broken, and their structure examined under a microscope. The first two experiments were made with anthracite and coke. Two bars, one surrounded with coke and the other with anthracite coal, were heated to 900° C. for four hours, and showed a penetration of from 0.15 to 0.16 millimeter (0.0059 to 0.0062 inch) only. The third experiment was made with burnt leather under the same conditions as before, and showed a penetration of 0.0622 inch, ten times greater than the former.

Thinking that this was due to the effect of nitrogen, two other bars were taken, one being previously heated to 550° C. in an atmosphere of ammonia for four hours, and placed in a special cementation chamber, with a non-nitrogenous agent, as burnt sugar, for eight hours, during which they were subjected to a constant temperature of 1,000° C. This experiment, after a number of repetitions, showed a ratio of penetration of 45 to 32 between the two bars, the ammonia vapors assisting the penetration of the carbon.

At 1,000° C. cementation can be easily accomplished, since with a non-nitrogenous agent the steel approaches its melting point, and the preliminary ammonia treatment influences the steel during the first few seconds of the process only. Mr. Scott, therefore, built a special furnace in which two boxes could be placed. One of these boxes had a tube for the admission of the ammonia gas; this tube was 0.472 inch diameter and 2.36 inches long, and was screwed into one side of the box, small apertures allowing the escape of gas in the opposite side. The second box has similar dimensions to the first, but had no tube and was hermetically sealed. Bars covered with burnt sugar were placed in each box, and both boxes placed within the furnace, where they were subjected to a temperature of 900° C. for four hours. The ammonia gas was passed into the first box during the whole time. The bars were then allowed to cool.

After the bars were withdrawn from the boxes they were examined and showed very different aspects. The bars which were untouched by the ammonia were blue-blackish and were easily cut with a saw, while the others could not be sawed and presented a whitish appearance. The treated bars showed a penetration of .0708 inch, while the untreated bars did not show more than .0566 inch. This completed the experiments.

It is evident from the above experiments that the presence of nitrogen in cementation acts beneficially in causing a deeper penetration of the carbon into the steel."

While the above experiment is very interesting in itself, it is of more interest here in that the reverse point of view tells us that if carbon is not wanted to a great depth, it will be desirable to avoid contact with the nitrogen in such form as to render it potent as an agent. There are other gas problems in the same way, and while time may afford the requisite data by means of which the best results may follow, the fact remains, for the present it is wise to eliminate all unknown quantities.

Of "muffle furnaces" there are many sizes, shapes and types; they serve for many purposes and, as before stated, in the hands of skilled manipulators, serve the purpose very well, indeed. There are other and superior methods of heat treating, however.

(To be continued.)

How To Prolong The Life of A Tire

By Hiram Percy Maxim

WHAT is the matter with our Tires? This question is probably asked by the autoing public more times a day than all other automobile questions put together. That there is very much the matter with our auto tires is undoubtedly the case, and it is the writer's object to point out what is probably the greatest trouble.

The primitive tire is the metal band around a wheel which forms a tread. The modern pneumatic tire is a band of compressed air around a wheel which forms the yielding tread we require for an automobile. The metal tire is able to hold its shape and its position on its wheel by virtue of its natural strength. The air tire is not only unable to hold itself together, but it is striving with all its might to dissipate itself. It requires some form of a retainer or envelope for holding it—and just here, in more senses than one, lies the rub.

The container or envelope which many years of experience has taught is the best compromise, is a combination of rubber and cloth fabric. The former furnishes the air tightness, while the latter furnishes the mechanical strength to withstand the strains. For convenience in repairing accidental air leakages a removable inner tube is used, which leaves the strain and wear resisting to the outer portion of the structure, which then becomes merely an outer casing or "shoe," as it is termed.

Now, it so happened in the course of the development of the automobile that as vehicles became rapidly larger and heavier and speeds higher and higher, this outer casing became thicker and stiffer until a very resistive structure resulted. Where the ordinary tack or nail would once always puncture, with the thick casings they were not long enough or strong enough. To-day it requires quite a robust nail to get through and puncture an inner tube. Some of us came to believe that tire troubles were beginning to be conquered, especially for the first few hundred miles after new casings were put on. This belief has always been short-lived, however, for a worse difficulty was confronted in the form of ruptures or bursting of the outer casings, or "blow outs," to use the popular term. This trouble is now the most pronounced form of tire trouble, some autoists believing it to be 90 per cent. of all tire trouble.

The failure of a casing is, of course, a very serious form of trouble, as a car cannot go on until a new casing is substituted for the one which ruptured, even though we overlook the very important expense involved. Under such circumstances the tire is, of course, blamed, and usually another make is tried next time. After trying every make and finding no material difference, the autoist, in exasperation, demands an explanation by asking the question with which this article opened—"What is the matter with our tires?" This question has not been satisfactorily answered publicly, and it, therefore, is a matter of considerable interest. In the accompanying illustrations the tire itself will be found to give its own answer.

Fig. 1 shows a 4-inch tire in its natural form as it would appear if cut open. The fabric which is incorporated in the rubber is shown distinctly. The inner tube is shown inside. Let us now see the effect upon this structure of deformation, for deformation and reformation, back and forth, is its daily life.

Fig. 2 shows a moderate deformation, such as would occur when a properly inflated tire ran over an obstruction approximately 1 inch high, something that occurs a great many times a minute during the running of a car. It will be seen in the illustration that the walls of the casing are slightly bent. When we bend such a relatively thick wall we require that the material in the wall "work" or stretch or "flex" very considerably. The more we bend the wall the worse this working or flexing.

Now let us look at Fig. 3. This shows what occurs when an *improperly* inflated tire runs over an obstruction approximately 1 inch high. Observe the bad bend in the fabric and imagine the result of repeatedly bending this material back and forth this amount, thousands and thousands of times. This is what happens when an improperly inflated tire is in motion. Obviously it must break the wall structure at the sharpest point of the bend sooner or later. It will be sooner if the bend is sharper, due to the tire being softer, and later if the bend is gentle, due to the tire being harder.

At this point let us examine ourselves and ask how we inflate our tires. Most of us must answer that we pump the tire until it *looks* fairly round where it bears upon the ground. Then we usually kick it, apparently on account of some extra accurate gauging ability of the toes of our boots. Look at Fig. 4. This is a photograph of a 4-inch tire on the rear wheel of a car, and which has been pumped by gauge to exactly 30 pounds pressure. *It looks fairly round.* In a hurry or on a hot day it is very easy to feel sure it is pumped up enough.

Now look at Fig. 5. This shows the same tire pumped up to 50 pounds pressure. It must be confessed there is difficulty in

Fig. 1—Four-inch tire in natural form.

Fig. 2—Moderate deformation of well-inflated tire.

Fig. 3—Deformation of improperly inflated tire.

telling the two figures apart. But this is not the worst. Examine Fig. 6. This is the same tire pumped up to 90 pounds pressure and photographed from the point which most tires are viewed from when judging their inflation. Ninety pounds is the pressure the tire should have, and tiremakers so advise.

Although it is three times higher pressure than that in Fig. 4, and nearly twice as high as that shown in Fig. 5, it would take a careful measurement to determine it. No amount of "looking" or kicking would give even a fair approximation of which was which—and here we have the real "nigger in the wood-pile" of our blow out troubles.

We inflate our tire by guessing at the degree of inflation, or attempting to judge it by the appearance of the tire, whereas the photographs clearly show that there is but little difference in outside appearance between a tire pumped up to 30 pounds pressure and one pumped up to ninety pounds. There is hardly a bit of difference between the appearance of 50 pounds and ninety pounds. Yet 50 pounds corresponds to the sharp bend shown in Fig. 3 and 90 pounds corresponds to the gentle bend shown in Fig. 2.

There is one more experiment we should make. This is to catch a tire actually passing over the 1-inch high obstruction, so we may study deliberatively just how things are. Look at Fig. 7. This shows our 30 pounds inflation, which is the favorite

Fig. 4.

Fig. 5.

Fig. 6.

Showing tires blown up to 30, 50, and 90 pounds pressure, and which shows that the appearance of the tire is deceptive.

of our wives and daughters on account of its soft riding qualities, passing over the obstruction. Notice the terrible punishment the thick and stiff wall of fabric must be receiving. The bend shown in Fig. 3 is not nearly as bad.

Now turn to Fig. 8. This shows our 50 pounds inflation passing over. This pressure is the average existing in the great majority of tires the country over. While its deformation is not as bad as the 30 pounds pressure of Fig. 7, yet we can easily see that it is enough to rapidly bring about a fabric rupture, when we realize that the passing over 1-inch high irregularities is practically continuous in the running of a car.

Now, finally, let us see what the deformation would be if we kept our tires pumped up to where the tire maker tells us we should keep them. Look at Fig. 9. This shows the properly inflated tire taking a 1-inch high obstruction. The bending and punishment of the casing is entirely different, and a casing would be able to stand it longer, probably, than the rubber tread would stand the wear it is subjected to. In other words, *although a properly and an improperly inflated tire have very nearly the same appearance when standing upon a flat surface, they suffer an altogether different degree of punishment when passing over irregularities.*

This really tells the story. The only thing remaining is to tell how a tire should be inflated to be sure that it is done properly.

The only way to properly inflate a pneumatic tire is to use a tire pressure gauge to measure just what pressure is actually in the tire. Such a gauge is shown in Fig. 10 when actually in use. The gauge is a small pressure gauge screwed onto the tire valve stem, and provided with a little lifter for lifting the tire valve so that the pressure in the tire may freely enter the body of the gauge. The tire pump or the inflating bottle tube is screwed to the gauge. With this arrangement there is no trusting to appearances. One positively knows.

And, now, in conclusion: With the tires of a car always hard it goes without saying that they will last longer. It is not impossible always to have them properly inflated, although it is by no means always easy to insure it. The ordinary chauffeur is not at all fond of pumping up a large tire, and he is very prolific in finding and devising reasons why it should not be done. He does not pay the tire bill, however. Tank and mechanical inflators are appearing upon the market in increasing numbers all the time, and perhaps this may assist in securing proper inflation. But in any event, unless the writer is very much more in error than he thinks he is, he can answer the question with which this article opened. This answer is: "We do not keep them properly inflated."

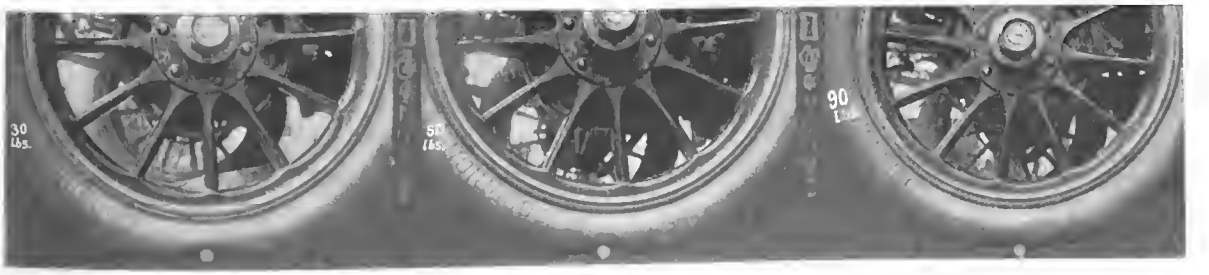


Fig. 7. Fig. 8. Fig. 9.

Showing the same tires passing over obstructions and the relative depressions in their surfaces, under 30, 50, and 90 pounds pressure.

CONSTRUCTION OF LIQUID TACHOMETERS*

By AMASA TROWBRIDGE, Member A. S. M. E.

IN any instrument designed for measuring the speed of a revolving wheel or shaft, the centrifugal force developed by the revolution of some part of the measuring instrument is almost universally used to give the indications. This centrifugal force should be applied as to eliminate, as far as possible, the errors due to friction or wear. This, its makers assert, cannot be attained by the use of a solid body as the flying balls in a ball governor, or the moving weights of a shaft governor. The Veeder tachometer, makes use of a liquid in a device similar to a centrifugal pump. By careful experiments extending over nearly eight years several forms embodying this principle have been perfected. As the paddle of the pump does not touch the case in which it revolves, there is no wear between the revolving paddle and stationary case. The bearings are so constructed that the wear is slight and does not affect the readings. The liquid does not change its character appreciably under any circumstances, and consequently the indications of the instrument will be correct after it has once been properly graduated.

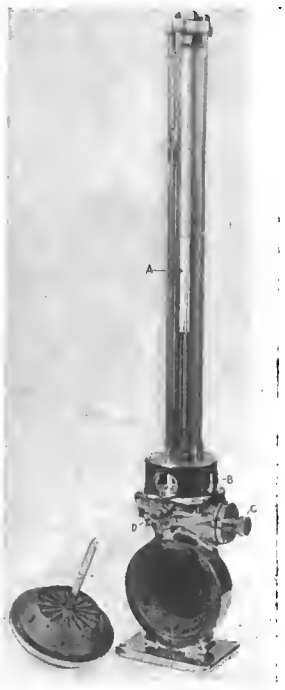


Fig. 1.—Veeder liquid tachometer.

The principle on which the liquid tachometer acts is, that the pressure developed by the centrifugal force of the liquid, when the instrument is running at a certain speed, is a definite quantity. This pressure forces liquid up the indicating tube A, Fig. 1, and is balanced by the pressure due to the height of the column of liquid in the tube.

Referring to the formula for centrifugal force, which is $F = \frac{Wv^2}{r\,g}$, we notice in this formula that there is but one variable, when r, the radius of the paddle, and W, the weight of the liquid, are fixed. Hence the indications of the instrument depend entirely on the velocity and do not change if wear is eliminated. The friction of the pump, generally speaking, need not be considered, nor its efficiency. If there be no flow of the liquid, the force F is expended in maintaining a pressure P, and this is equal to the pressure Wh due to the height of the liquid column. When the column is at rest, that is, when the speed is constant, F equals P, hence $\frac{Wv^2}{r\,g} = Wh$. It is obvious from this that W may be varied at will without materially affecting the height of the column. This is found to be the case, and it makes little difference in a liquid tachometer whether the liquid employed be something heavy like mercury, or light as alcohol. The indications are essentially the same for both liquids.

It is, of course, highly important that a suitable liquid should be chosen for such an instrument. In the first place it is necessary to choose a liquid which will not freeze at any temperature commonly encountered. It should be also as safe as possible in regard to fire, because it may frequently be used in the neighborhood of an internal combustion engine, where inflammable vapors would be dangerous if allowed to escape. Also, it should be readily obtainable; and such that its viscosity will not be materially altered by the ordinary change of temperature. The viscosity of the liquid makes a slight difference in the height of the indicating column.

EFFECT OF VISCOSITY ON REVOLUTIONS REQUIRED.

Material	Kerosene.	Water.	Alcohol.	Benzine.	Sperm Oil.	Paraffin Oil.	Valvoline Oil No. 2	Glycerin.
Revolutions required	852	851	850	849	807	792	788	779

A series of experiments was conducted to determine the relative viscosities of various liquids. The more commonly used liquids were tested in the following manner: An instrument having a long tube was put on the testing machine filled with one liquid and run at such speed as to give a fixed height of column. The first liquid tested being alcohol, a height of column corresponding to 850 r.p.m. was taken. The other liquids were each in turn put into the same instrument, and the revolutions of the instrument required to maintain the same height of column were taken, as shown in above table. It is surprising to find that benzine is more viscous than kerosene. Experiments are still being conducted on this point, the results of which are not ready for publication. Other points which must be considered are the lubricating qualities of the liquid and its liability to corrode the metal of which the instrument is made.

The Veeder tachometer, in one of its present forms, is shown in Fig. 1, with paddle removed. This instrument embodies all of the necessary points enumerated above. The only moving part of the instrument is the paddle, which imparts the necessary centrifugal force to the liquid contained in the body of the instrument. A small reservoir B is located directly above the paddle case. In the center of this reservoir is a glass tube through which the liquid flows to the glass indicating tube A. A suitable zero mark is provided around this small tube in the center of the reservoir. The liquid rises by capillary attraction in this small central tube somewhat above the level of the liquid in the reservoir. This enables the instrument to be set at zero very handily, a displacement plug operated by a small thumb nut shown at C enabling the operator to raise or lower the height of the surface of the liquid to exactly the zero mark. The glass indicating tube is about 12 inches high, although a scale fully 3 feet high can be used where extreme accuracy is necessary.

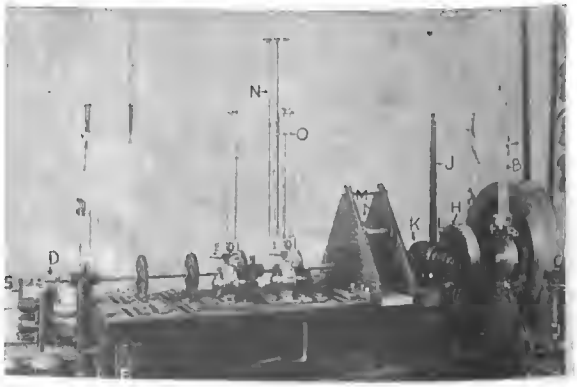


Fig. 2.—Testing machine, with paddle wheel shaft driven by geers.

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Free passage is provided from the reservoir to the center of the paddle wheel, allowing the liquid to flow freely to the paddle wheel, from which it is thrown out through very small orifices in the periphery of the paddle case. At the front of the instrument is a small handle *D*, which operates a valve to choke the passage from the pump to the indicating column. This prevents

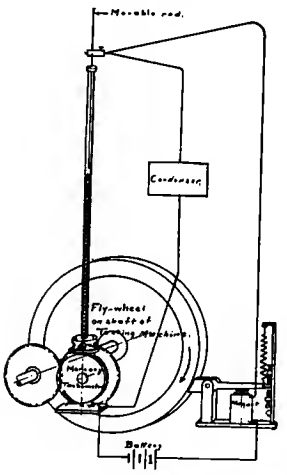


Fig. 3.—Automatic speed controller for testing machine.

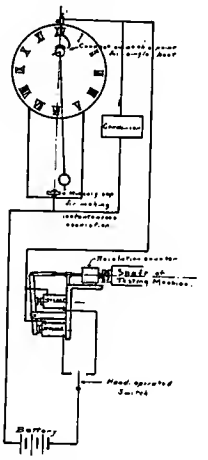


Fig. 4.—Connections for the speed counter.

the dancing or vibration of the liquid column, due to any sudden fluctuation in the speed of the revolving body whose revolutions are being indicated. The liquid used in this instrument is alcohol colored with an aniline dye. This liquid has been found extremely satisfactory, although other liquids may be used in place of it for certain cases.

It is evident that the graduations in this instrument will not be evenly spaced from zero up to the maximum. The height of the liquid column depends on the centrifugal force, which varies with the square of the speed of the paddle; hence, the graduations will be more open at the top of the scale for the high speeds than at the bottom, where the low speeds are measured. This is an advantage in some ways, especially on automobiles, since the graduations are large at high speeds when the vibration is greatest. Of course it necessitates a number of different instruments to cover the ordinary ranges of speed because the readings from zero up to about one-third of the maximum reading of the instrument are of no value, the graduations being so close that they are entirely omitted.

The liquid is admitted to the paddle case from the reservoir by passages on both sides. When the liquid is admitted from one side only, a slight change in the position of the paddle axially makes a change in the indications. This is not found to be the case where the balanced admission opening is used.

The blades of the paddle are radial, for the purpose of making the instrument reversible. The radial blade is, of course, not the most efficient, but, as stated above, the efficiency need not be considered. A ball thrust bearing is provided for the paddle shaft, thus eliminating any wear that would prove injurious. The outlet for the liquid consists of a number of small radial holes, equally spaced around the periphery of the paddle case. With a single discharge opening it is found that if through wear of the bearings the paddle becomes eccentric with the case, then reversing the instrument changes the indications. The diameter of these outlet holes is very small, to check any surging of the liquid. They discharge into an annular groove extending around the paddle case, and this annular groove is connected by a single hole to the indicating tube.

One of the greatest difficulties encountered in making this instrument has been to get the entrained air out of the liquid. The small passages used in the pressure side offer little opportunity for it to escape, hence it stays in the paddle case. The trouble has been eliminated by so shaping the paddle that as soon as the paddle revolves this air is forced to the center of the paddle and is discharged through the center openings. If the air is allowed to stay in the paddle case it furnishes a compressible cushion for the column of liquid, and materially reduces the effective area of the blades, especially in the small diameter paddles. A slight change in the temperature of this air also affects its density to such an extent as to alter the reading of the instrument. Some instruments having glass sides were built for the purpose of studying the action of this air to determine ways for eliminating it.

The sensitiveness of the instrument is such that at the maximum speed for which it has been made commercially, namely, 2,500 r.p.m., a difference of one or two revolutions is very noticeable. This shows that the instrument can be made to indicate within less than one-tenth of one per cent. Under ordinary circumstances the indications will be correct within one-fourth of one per cent.

The instrument is portable, and can be readily handled, and there is no difficulty in holding the column practically vertical. It may be used either by holding it in the hand, the paddle wheel shaft being driven by a short flexible shaft pressed against the end of the revolving member whose revolutions are to be measured, or it may be fastened down and driven by gears, as in Fig. 2. This latter is the preferable method because the instrument is then held very steadily, and the entire attention of the operator can be given to reading the indications.

To carry on the experiments for these instruments, Mr. Veeder built a testing machine, shown in Fig. 2. This testing machine is run by an alternating current motor used exclusively for this purpose. The motor is connected to the testing machine through an Evans friction cone, which gives a ready means of changing the speed of the machine through a certain limited range.

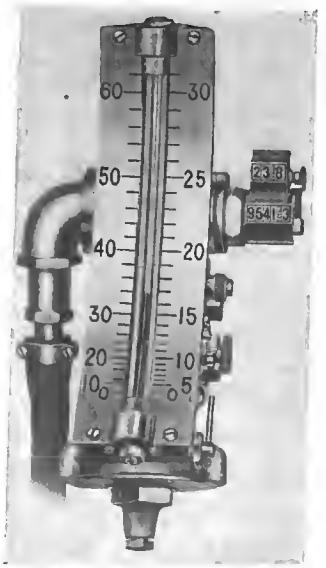


Fig. 5.—Type of tachometer for automobile service.

To keep the speed of the testing machine constant, a mercury tachometer *B*, Fig. 2, having a tube about three feet high, is placed at the driving end of the machine. This tachometer controls an electrically operated brake, which bears against the periphery of the fly-wheel, as shown at *C* in Fig. 2. Because the inertia of this wheel is very great in proportion to the force applied by the brake, there are no sudden fluctuations of speed. The mercury tachometer is an extremely delicate instrument and either makes or breaks the circuit which operates the friction brake. An insulated rod is carried through the top of it and connected, as shown by the diagram, Fig. 3, to the brake magnet. By adjusting the vertical rod, the tachometer will control the testing machine through a considerable range of speed. The action of the brake is clearly shown in the diagram. A condenser is used to avoid oxidation of the mercury at the point of contact.

To check the testing machine, the shaft of the machine is connected to a revolution counter, as shown at *D*, Fig. 2. The connection between this counter and the shaft is automatically made at the beginning of a minute by master clock. At the end of a minute, this connection is automatically broken by the same clock, and the difference in indications of the counter

shows the number of revolutions made by the shaft of the testing machine in the minute. Slight changes in the speed of the spindle of tbe testing machine will, of course, be very evident from this method of checking.

The diagram, Fig. 4, shows the method of connecting tbe clock to the revolution counter, which is driven by the end of the shaft of the testing machine. Special attention is called to the fact that the connection is made by the clock for one single beat, or half period, of tbe pendulum only; that is, while tbe pendulum swings from left to right. This necessitates that the time during wbich there is a complete circuit is a small fraction of a second, namely, while the point of the pendulum passes througb the mercury cup at the middle of the clock, hence at tbat point which the pendulum passes with its greatest velocity. This arrangement determines that exactly one minute shall be the time between the throwing in of the revolution counter and its disconnection. It was also found necessary to insert a condenser in tbis electric circuit for the purpose of preventing an arc, as in tbe case of tbe mercury tachometer.

At *F*, Fig. 2, tbere is seen the band switcb by which the circuit is made ready for the clock to throw the revolution counter into or out of gear. By throwing the switcb one way the clock will throw the counter into gear. If thrown over on to the other side, the counter is thrown out of gear at the end of that minute. By using this hand switch it is possible to make the count extend over as many minutes as may be desired. The shaft of the revolution counter is carried by the lever *G*, Fig. 2, and has on its end a key which engages positively in one of a number of slots on tbe end of the testing machine sbaft. This counter bas been safely operated at as bigh a speed as 5,000 r.p.m., and this method of registering is such that it is absolutely reliable.

In Fig. 2 tbere is sbown at *H* a friction clutch, the outer part of which is driven by the fly-wheel shaft. Between the bevel gears *K* and *L* is a jaw clutch, keyed to the shaft carrying the inner part of the friction clutch. This is operated by the lever *J*. Tbe first part of the motion of the lever engages the jaw clutch with one or the otber of the beveled gears. Its remaining throw engages tbe friction clutcb. By throwing the lever one way or the otber, the direction of rotation of the main sbaft of the machine may be changed.

For calibrating any particular instrument, the fly-wbeel end of the shaft is operated at a constant speed, usually 1,000 r.p.m. Under ordinary circumstances, with a speed of 1,000 r.p.m. the variation will be less tban half a revolution either way from the standard. With special care, this can be reduced to ¼ revolution, or a total variation of one-twentieth of one per cent. This speed is transmitted to that part of the shaft which directly drives the instruments througb tbe back-gearing shown at *M*. By means of tbe changes accomplished by these back-gears, the speed of the fly-wheel need not be changed during tbe calibration of the instrument.

The device shown at *N* in Fig. 2 is used for calibrating the instruments. The screw in this device has a very accurately cut thread with 14 threads to the inch. At the top of the device is seen a plate with 100 graduations equally spaced. From this it is seen that a vertical adjustment of the sigbting piece shown at *O*, Fig. 2, amounting to about 0.0007 in., can be measured.

A number of instruments of a given size are set on the testing machine at once. The height of the liquid column in these instruments is then measured, a record being kept for each instrument. The average of these readings is tben taken for establishing a suitable scale to be used on instruments of that size. The calibrating device is removable and can be shifted from instrument to instrument without cbanging its setting. In this way very small variations in the different instruments can be noted and any errors due to bad workmanship or imperfections in the parts can be readily detected.

Among the many applications to which this tachometer has been adapted, the first has been for laboratory service in testing dynamos, engines and other machines having revolving members. The instruments have also been adapted for switchboards, grouped with the otber instruments. Here they give a continuous indication of the r.p.m. of either the engine or generator.

Another use to which these instruments have been adapted is as a speed indicator for automobile and locomotive service. The type commonly used on automobiles, sbown in Fig. 5, has a double paddle, the larger diameter used for low speeds, the smaller for high. To make use of this, a double scale is put on the instrument, one reading to about 30 miles per hour, the other twice as higb, and the instrument is arranged to use either of these by simply shifting a small lever, which turns a three-way valve. If the lever is pulled toward the operator, a valve closes the passage from the large diameter paddle to the indicating tube and opens the passage from the small diameter paddle, and the instrument is set for the high-speed scale. If the lever is pushed back, the opening from the small paddle is closed and the one from the large paddle opened. There is no harm done if the liquid flows over the top of the instrument as it is returned to tbe reservoir. In tbis instrument there is a reservoir on each side of the indicating tube, so that the major portion of the indicating tube is nearly over the center of gravity of the free surface of the liquid. When the car is running at low speeds, however, the column of liquid in the indicating tube is not directly over the center of gravity of the free surface, with the result that any acceleration of the car makes the liquid indicate somewhat higher than it should, while any retardation has the opposite effect, this being due to the inertia of tbe liquid. For automobile service these errors are not great enough to make any particular difference.

In the form of instrument used for railroad service, the center of gravity of the free surface of the liquid lies at the center of the indicating tube, so that acceleration or retardation of tbe car, or an inclination to either side, has practically no effect on the indicator.

These speed indicators have ball-bearings throughout and all the features enumerated above, which go to make a permanently accurate instrument. An odometer giving the mileage for each trip, as well as the total mileage, is attached to each one, thus making them complete devices.

WHEN PURCHASING WOOD ALCOHOL FOR COOLING

THE idea in using alcohol in the cooling system, is to get away from the use of water. In other words, the freezing point of the liquid used must be lowered, to prevent freezing in the system, and the consequent disruption, which is bound to follow if the solution solidifies, since then bulk increases and is irresistible. It would seem quite out of place to purchase alcohol for the purpose, were the same half water, since water is to be displaced in the system. In the purchase of alcohol then, for the purpose, care should be exercised to order the same as free from water as possible.

According to tbe United States Pharmacopœia, "alcohol" should hold 91 per cent. alcohol and 9 per cent. water, "proof spirits" only hold 55 per cent. of alcohol, and "absolute alcohol" will run about 98 per cent. of alcohol with 2 per cent. water. An alcoholometer reads Zero (0) in water and 100 if tbere is no water present. Tbe alcoholometer, then, shows by its workings the percentage by volume of alcohol present.

Because of the high price of grain alcohol, the formula for which is C_2H_6O, it is customary to use wood alcohol, the formula for which is CH_4O, and because of this difference in the composition of the two grades of alcohol, the alcoholometer should be purchased to use with wood alcohol on the one band, or with grain on the other, depending upon the kind of alcohol taken in any given case.

LETTERS INTERESTING AND INSTRUCTIVE

A PROBLEM IN SIDE LEVER BRAKE CONTROL.

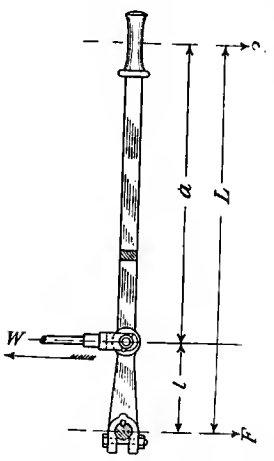
Editor THE AUTOMOBILE:

[1,647.]—I desire to equip an old car with a new set of emergency brakes, and am puzzled about the length of the side lever, and the point at which to fasten a cable (above the fulcrum) in order to be able to work the brakes, without too much of an effort on my part, when I desire to apply the brakes. Will you tell me how to solve this problem?

New York City. LAZY.

In the absence of data in relation to the car, and also, in relation to the brake-drum shoes, and means of applying pressure, it is only to be able to advise you in relation to the "side lever," which, apparently, is all that you want to know.

The illustration will enable you to grasp the situation, if you will there note the reference letters, and then use the formulas of levers of the second class, viz.:



Illustrating Side Lever Brake Problem.

$P = \frac{W l}{L}$ = pull exerted by the operator, say 50 lbs.;

$W = \frac{P L}{l}$ = equivalent strain resultant of the pull "P" in pounds (neglecting friction);

$l = \frac{P a}{W - P}$ = distance from the fulcrum to the work rod in inches;

$L = \frac{W a}{W - P}$ = length from the fulcrum to the point of pull, in inches;

$a = L - l$ = the distance from the point of pull to the work rod, in inches.

For a pull of 50 pounds, if $l = 6$ inches and $L = 30$ inches; we would have:

$$W = \frac{50 \times 30}{6} = 250 \text{ lbs.}$$

Likewise, any other similar problem can be solved, and knowing what the value of "W" should be, one can solve for the dimensions by means of the formulas, assuming some of the dimensions.

ENERGY OF BATTERY SHOULD BE CONSERVED.

Editor THE AUTOMOBILE:

[1,648.]—I have two spark coils, and would like to know which is the best, since they both give about the same length of spark. No. 1 coil takes about one ampere of current, while No. 2 coil takes very much less. It looks like the one taking the least current would be the best.

Belton, S. C. G. D. ROGERS.

The problem is one involving two fundamental ideas, viz:

(a) the spark must be adequate for the purpose;

(b) the battery energy should be conserved.

The coil that shows the highest ampere reading is the one not to use if the other coil will deliver a spark of sufficient energy to accomplish the purpose. Sometimes the voltage of the battery is more than it ought to be in view of the coil used. This ends in lack of economy, at the expense of excess battery. Each coil has its constant, that is to say, the voltage of the coil should be considered, in selecting the battery.

CASE HARDENING NICKEL STEEL PRODUCT.

Editor THE AUTOMOBILE:

[1,649.]—I would like to know the exact difference between nickel steel of the ordinary grade, and the same kind of steel to be casehardened?

New York. CURIOUS.

Nickel steel may be of any of the compositions in which nickel may be a component. If, however, the steel is to be "casehardened," it is necessary that the carbon content be held at a very low point.

If, in casehardening steel the carbon is high, the shell will be glass-hard, as desired, but the core will be hard also. The result will be, on the whole, the steel will not possess kinetic properties to any extent, and in the absence of these properties the steel will fail to sustain, under shock, loads.

On the other hand, if the carbon is low the core will remain soft while the shell will attain "glass hardness" by virtue of the cementation, due to which the carbon will be increased, by artificial means, in the shell, to a sufficient depth to serve the purpose.

The shell will be just as hard in the cemented low-carbon steel as in the higher carbon material, the strength under shock loads will be vastly greater.

A GRAVE DEFECT OF DESIGN.

Editor THE AUTOMOBILE:

[1,650.]—I have a "double-opposed motor" and lately, when I was sailing along, the bottom of the water tank fell out, leaving me in a bad way. Closer examination enabled me to discern a leak of water to the combustion chamber of one of the cylinders, and I decided that I must have run the motor (for some distance) without water, to the end that the casting must have been damaged, but I cannot locate the trouble more than to assure myself that the water does not get into the cylinder. What can you make of it?

New York City. N. B.

Your trouble is easy enough to locate, but it will not be so easy to repair. The water tank blew out because the explosive mixture accumulated in the water system, as a result of a defect in the cylinder-head plug, brought about through the difference in expansion, between the inner and the outer walls, and the fact that the threads on the plug or hole were stripped.

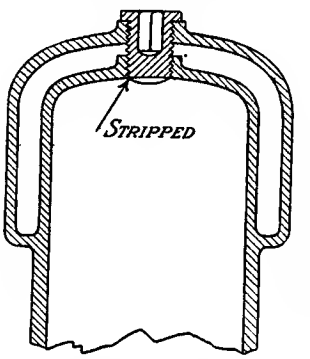


Fig. 1.—Threaded bronze plug in cylinder head.

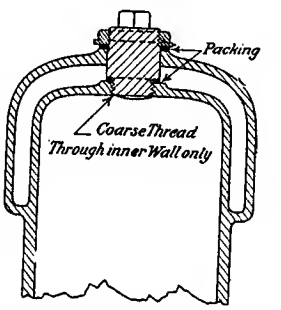


Fig. 2.—Steel plug threaded into inner wall only.

Fig. 1 will show the details of design and the repair will depend upon whether or not the threads were stripped off of the plug or the cylinder-head hole. If the threads in the hole are stripped, it is to have the hole enlarged and rethreaded, besides having a new plug made to fit the new diameter. Instead of the scheme of design, Fig. 1, adapt the scheme Fig. 2. Even so, it is a fact that plugs placed in this fashion are defective, in that the difference in expansion are not compensated for in any

way, and brute force must struggle with that which skill would manage without an effort. Under the circumstances, Fig. 2 shows the lesser of the evils. If the work is well done, the repair in this fashion, will sustain.

PICRIC ACID DESTROYS THE CYLINDER.

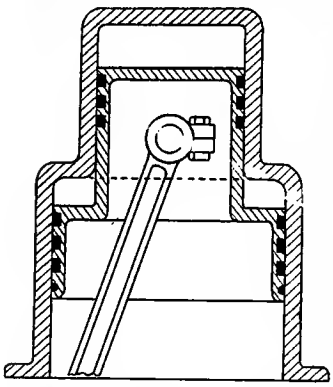
Editor THE AUTOMOBILE:

[1,651.]—Have you any data on the subject of picric acid being used by ths racers in the Vanderbilt Cup race? Do you know what proportions were used?

Will you aleo explain to me why tbere is a practical limit to ths size that cylinders may be bored? What is it that fixes the limit—is it weaknese of cylinder walls or difficulty in cooling or carburetion?

Will you explain ths double piston system of the Gobron-Brillé? Is there an increase of horsepower resulting from their arrangement?

THE QUESTION MARK.
Far Rockaway, L. I.



Section of Double Piston Idea.

Picric acid belongs to the detonator family and when mixed in gasoline, after it is dissolved in alcohol, it does increase the rate of flame propagation, resulting in more power. A saturated solution of picric acid in alcohol can serve as 5 per cent. of the total fuel, the balance gasoline. It must be remembered that picric acid is an etching ingredient, which is another way for saying that it will destroy the cylinder walls.

In relation to the question of the sizes of cylinders, enough is to say there are no such limits as you would seem to think. Cylinders for internal combustion motors are built in very large sizes, say, 20 inches bore. In automobile work, it is the weight efficiency that limits the use of the larger cylinders, it being the case that the weight efficiency decreases rapidly with increasing bore of cylinders.

The idea of the double piston, as used by the Gobron-Brillé Company, is illustrated in the figure herewith.

WHY USE FIVE CYLINDERS IN A MOTOR?

Editor THE AUTOMOBILE:

[1,652.]—The evolution of the gasoline engine as applied to motor vehicles, bringing about an increase in the number of cylinders, seems to have skipped the number five in its progress. There are four-cylinder cars and six-cylinder cars, but the writer has not beard of five-cylinders being used in the commonly accepted type of four-cycle multiple-cylinder motors. Why is this? The answer might be that an addition of 25 per cent. of power to that developed in four cylinders is inadequate to the additional expense of the different crankshaft construction alone, not to mention other expense featuree, six-cylinders giving 50 per cent. increase being preferable. And in these days when lower-priced cars are receiving the attention of manufacturers, the matter of one or two cylinders more than four may, perhaps, be neglected by many makers. But for smooth running and perfection in cars of 35 to 50-horeepower, why not five cylinders? Why not five instead of six? To be sure they could not be mounted in pairs, but many makers now assemble six singly. Five cylinders certainly provide the best poesible order of firing for multiple-cylinder four-cycle engines. A glance at a diagram showing five crankshaft cranks 72 degrees apart around the circle, with the order of firing in cylinders numbered from front to rear, say one, three, five, two, four, one, reveals that the cranke receive the firing alternately around the circle, without interruption of that order, effecting a more perfect distribution than is possible with six cylinders. Then, too, the difficulties attending the demand of a six-cylinder engine upon the carbureter and the possibility during the "overlap" of one cylinder pulling the charge from another would be considerably lessened in an engine of five cylinders. Cars fitted with an engine of this type, with crankshaft somewhat off-set, and piston connecting rods as long as consistently possible, equipped with high-tension magneto, perhaps an extra complete magneto carried to replace, in emergency, would, it seems to the writer, bs deserving of the attention of many a prospective buyer. Why not a five-cylinder car?

C. H. G.
LaCrosse, Wis.

Why five cylinders? Why not seven cylinders? There is just as much meat in the cocoanut.

Six cylinders are chosen for the reason that the kinetic balance is more perfect than can be, this necessary condition with five cylinders, or, for that matter, with any number less than six cylinders, from all accounts. In any event, the prime reason for using more than one cylinder is to attain the desired power in any given case, with the highest weight efficiency, that is to say, the desired power capacity, attended by the minimum weight. This prime consideration presupposes any number of cylinders—including 1, 3, 5, 7, or the even numbers 2, 4, 6 and 8.

When designers find it an advantage to use more cylinders, rather than increasing bore, of the smaller number of cylinders, they have to take into account two conditions, viz.: (a) static balance and (b) kinetic balance. The static balance is not difficult of attainment, since it demands symmetry of figure and equal weight at equal radii spaced 180 degrees. The weights do not have to be in the same radial plane for a static balance. It is even possible to arrange a static balance, with unsymmetrical shapes, by using balancing weights, but directly rotation is set up the static condition is displaced by the mass in motion, which motion may be uniform or it may be accelerating. For the condition of rest, equal and apposite weights of equal radii will remain at rest, even though they are not in a common radial plane. Directly motion is imparted, the difference in planes will assert itself, and lack of symmetry will introduce disturbing moments. The fifth crank, and its relation, would not balance an opposite force in any plane sufficiently to afford the real kinetic balance of the "six." In other than automobile work a five-cylinder motor is used, and evidently the difference in running balance is not so very great as to preclude the use of the "five," if the platform is stable, and if the weight in the base is so great as to assure a low center of gravity, etc.

Carbureters work well on eight-cylinder motors, so that there should be no insurmountable difficulties in connection with six cylinders. The off-set to the crank is a matter besides the number of cylinders.

All the accessories you name could go with any number of cylinders.

THE BOSCH MAGNETO IN THE VANDERBILT.

Editor THE AUTOMOBILE:

[1,653.]—In an effort to establisb definitely the true cause responsible for the loss of a position of suprsmacy attained by the Chadwick in the recent Vanderbilt race, first reported ae due to ths burning out of a magneto, it has been learned that neithsr of the Bosch magnetos in use on the car during ths race burned out. A report circulated to that effect has proven absolutely false, and since has been recalisd by the Chadwick Engineering Works, whicb founded its first beliof on erroneous information.

A searching investigation clearly proved that nothing but malicious interference in the mechanism of the magneto, by a wilful hand, with the apparent object of disabling either the magneto or the car, was responsible for the unfortunats handicap of the Chadwick.

With reference to the Renault and No. 7 Matheson, both of wbich experienced ignition trouble during the Vanderbilt race, as was stated in the various trade papers, it is ths general prsvailing opinion that these cars were during the race equipped with a Bosch magneto, because this magneto is the standard equipment on cars of their manufacture. For reasons tbus far not ascertained anotber make of magneto was substituted in this particular instanc for ths "Bosch" standard equipment. In the cass of tbe Renault car, according to the printed statements, this substitution was accomplished the very night before the race.

It is thus evident tbat wherever ignition troubls was reportsd the Bosch product was not responsible. In all other cases wbere Bosch magnetos were employed, ignition gavs as usual splsndid results.

In simple justice to our product we would aek you to give this letter ths prominence it deserves in correction of previous statements as appeared to the contrary in various publications.

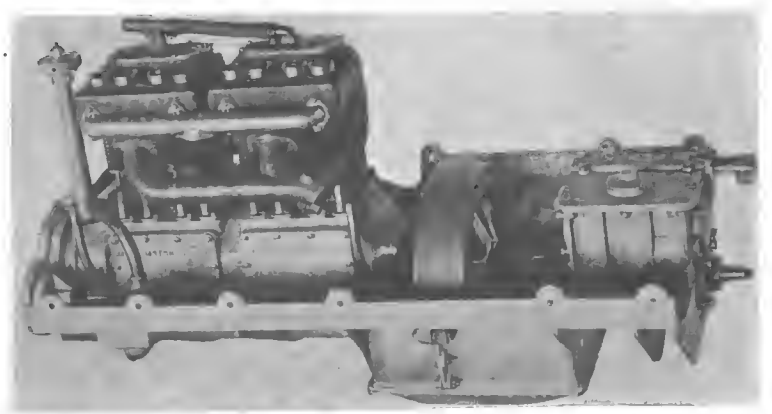
BOSCH MAGNETO COMPANY,
New York City. E. H. Heins, Vice-President.

MORA - 1909 Light Four

THE Mora Motor Company, of Newark, N. Y., is making adequate provision for the coming year by way of a light four-cylinder model, which will be turned out as a touring car or with a "racy" type body, to suit the individual taste. The company will also place at the disposal of the trade the same type of car fitted with a limousine. The illustrations accompanying this article will go a long way toward showing the nice arrangements, neat design and clean-cut work. These products are bound to attract a good deal of attention, because of a close conformity to the conventions and a certain well-defined selection of details in the design, backed up by precedent.

Some Features of the Power Plant.—In the motor the Mora Company has retained what it terms the unit construction aluminum pan, which has been a feature in its cars for the last four years. The company also points out that the power plant is substantially the same as that used in the "sealed-bonnet record car" in the past. The cylinders are 4 by 5 1-8 inches bore and stroke respectively, while the crankshaft is of the three-bearing type, with supports of liberal dimensions to the base of the pan. The rear end crankshaft bearing is 4 inches long, while the middle and front are 3 1-8 inches long. The pistons are of unusually long dimensions, with bronzed-bush piston pins, in turn held fast in the rod by a taper bolt. The motor is of the water-cooled genera, with a gear pump circulation and a cooler of liberal proportions, placed over the front axle. The ignition is by a four-unit coil, using a storage battery for the electrical supply, and the carburetion is well up to the usual Mora standard. The motor is rated at 24-28 horsepower, and is located under a neat and secure bonnet at the front.

In Relation to Transmission System.—From the leather-faced cone clutch to the three-speed selective change gear system the transmission shaft and other details are of rugged construction and clean design. The cast aluminum supporting pan, which has always been a feature of Mora cars, is here again in evidence, since it acts as a support for the transmission, as well as the motor. As the maker states, "it serves to keep the transmission and motor in perfect alignment." It also acts as a competent mud protector, and aids from the point of view of accessibility, which question of accessibility is also considered elsewhere throughout the car as well. From the transmission gear to the rear axle the power is lead through a hardened steel block, squared in the direction of rotation and rounded in the fore and aft plane. This block slides in a hardened steel casing, with a square hole, which casing in turn is fixed to the change-gear shaft. Through the bevel drive the power is transmitted to the live rear axle, and right here attention will be called to the provision of a neat adjustment by means of which the bevel pinion can be accurately mated.



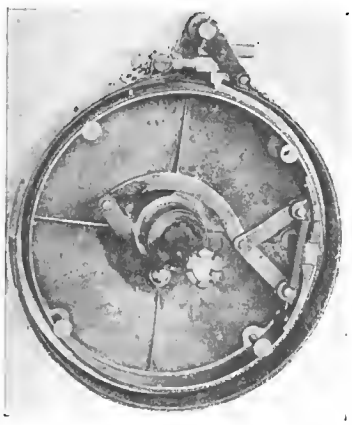
Mora World's Record Sealed Bonnet Power Plant.

Features of the Chassis.—Beginning with the pressed steel channel section drop frame, rigidly supported laterally, suspended on springs of adequate mass and neat design, the eye quickly takes in a straight line drive brought about by the use of the drop frame. Another look and the "I" section front axle intercepts the view, while the brakes on the rear axle are rendered conspicuous through use of 14-inch diameter drums. But if the brakes are large, they are no less efficient because of the use of equalizers, and the wheels are fitted with ball-bearings, with suitable provision for lubrication. The general appearance of the chassis is that of a well-designed car with semi-elliptical springs, front and rear, which general appearance, however, does not disclose a progressive series of nice details, as, for illustration, the emergency brakes interlock with the clutch, whereas the foot brakes do not interlock. The control, in other ways, is that which would give an autoist nothing to think about but the pleasure of riding, due in a large measure to the details of design of the tried-out carbureter, in which the single nozzle is concentric with the float and the regular air supply passing through little holes in the side of the nozzle chamber, with a cylindrical shutter placed to close these holes. The auxiliary air on the other hand is admitted to a spring-retained poppet valve. It was stated that the ignition is by a four-unit

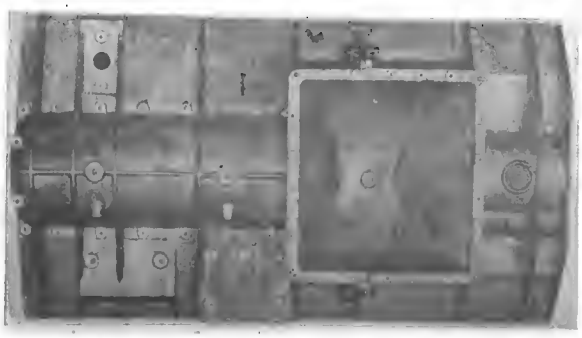
Universal Joint Parts, Showing Liberal Driving Faces.

spark coil and storage battery; this is only true when the car is sold at $1,850. At $2,000, the dual ignition then provided includes a magneto. In view of the excellence of the illustrations here afforded, and considering the sustained reputation of Mora cars, the balance of the story can be anticipated.

Relation of Quality to Price.—In view of the price at which the Mora cars are sold, it is rendered desirable to take into account the characteristics of the cars themselves, and to note the numerous refined details. In order to be able to appreciate the wonderful advance that has been made in automobiles, notwithstanding the trend in the direction of lower price, the very refinements to which reference is made must be taken into account and constitutes the best reason for a moderate price. Refinements in this case manifests itself by way of simplicity in design, the elimination of unnecessary parts, and symmetrical members that are more easy to make. By adopting die forgings, and pressed steel members instead of castings of inferior metal, the cost of machining is naturally reduced, the number of "wasters" are very materially cut down, and the purchaser gets a better automobile for less money. There are few experienced autoists who would fail to remember that divers of the improvements to be noted in this car were merely as unfilled wants when products cost twice as much as the amount named for this product, nor will their memory have to take them back more than three or four years at the best. In view of these facts, the Mora Company claims its product is on a high plane, due to consistent effort, aided by absolutely modern facilities.



Brake Drum, Showing Linkages and Take Up.



Plan of Mud-proof Aluminum Pan Construction.

POPE REORGANIZATION PLAN APPROVED.

HARTFORD, CONN., Nov. 23.—Reorganization of the Pope Manufacturing Company, which went in a receivership a little more than a year ago, is now practically accomplished, much to the satisfaction of all interested parties. Vice-Chancellor Howell, of Newark, N. J., on Thursday of last week, filed an opinion authorizing the sale of the Pope plants, and various other assets, to a reorganization committee for the sum of $1,500,000. The opinion of the Vice-Chancellor is somewhat lengthy and covers the situation thoroughly. But one objection was raised from the start, and that was by the holder of 100 shares of the actual par value of $10,000, and he held out to the very end, and contended that the offer was "grossly inadequate."

Charles E. Gross, of Hartford, counsel for Albert A. Pope, and George A. Yule, receivers, appeared before Judge Sbumway, of the Superior Court, asking for an order for the sale of the Pope assets to the reorganization committee, at the sum named, and Judge Shumway passed the order in conformity with that issued by Vice-Chancellor Howell the day before, thereby endorsing the action of the Jersey official.

Vice-Chancellor Howell has also authorized the sale of the Pope company's Hagerstown plant, from which the mechanical equipment has been removed, for $57,000, and of the Elyria, Ohio, bicycle factory which is owned by the Federal Manufacturing Company, whose stock is the property of the Pope concern, for $35,000.

A. L. Pope, one of the receivers, expresses satisfaction over the outcome, and states that the New York counsel, Joline, Larkin & Rathbone, were arranging for applications for the sale of the assets to be made in two federal courts, at Boston and Baltimore.

Henry V. Poor, of New York, is secretary of the reorganization committee and the members of that body are Harry Bonner, Frederick H. Ecker and Augustus Hechscher. The plan of reorganization provides for the issue of $800,000 in six per cent. notes, secured by a first mortgage, $2,500,000 of six per cent. cumulative preferred stock and $4,000,000 of common stock.

The receivers will at once pay the final and fourth dividend of 25 per cent. which will clear up the company's indebtedness. Since the receivership the company has made good progress and the outlook for the future is regarded as very bright. The remaining plants owned and operated by the company will henceforth be conducted on a different basis.

APPERSON FACTORY TO BE ENLARGED.

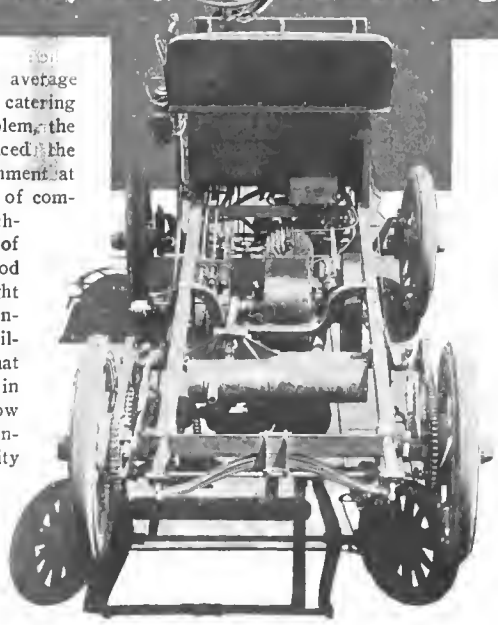
KOKOMO, IND., Nov. 23.—Plans have been approved by Apperson Bros. Automobile Company for the construction of a large three-story building, which will add 50 per cent. to the present available factory floor space, and work will be commenced at once on this addition and pushed to completion. Although the company owned sufficient available land for the new structure, it has purchased adjoining ground that can be so utilized as to allow of again doubling the plant at a later date.

While the Appersons are this year building a variety of models of various horsepowers and types, the two leading cars for 1909 are the new Model O, a four-cylinder 30-horsepower, selling at $2,450, and the new "Six-Forty." The latter, with the option of three-passenger body, baby tonneau, or five-passenger touring body, sells at $3,900. Sales Manager George H. Strout announces that the company has this year doubled the number of Apperson dealers, and has on hand unfilled orders and contracts for more cars than during any previous year. The company is now building a largely increased quantity of machines, and has been delivering 1909 models since August 1.

To Abolish the Crank.—Edward M. Agylman, of Janesville, Wis., in connection with the Janesville Machine Company, is working on a self-starter for automobile motors that promises overmuch, and for which he has applied for letters patent.

Knox Commercial Cars

DURING the years when the average automobile manufacturer was catering to the pleasure phase of the problem, the Knox Automobile Company placed the weight of their extensive establishment at Springfield, Mass., largely in favor of commercial automobiles. They approached this subject with a good deal of delicacy, realizing that, however good and serviceable the automobiles might be, it would still be necessary to convince merchants of their dependability under all of the conditions that are natural to the service, and in spite of a certain prejudice. How much of a problem it has been to convince merchants of the desirability of using automobile delivery wagons and trucks, instead of horse-drawn vehicles, is a matter that will never be understood excepting perhaps by the pioneers who made the attempt and brought it to a successful issue.



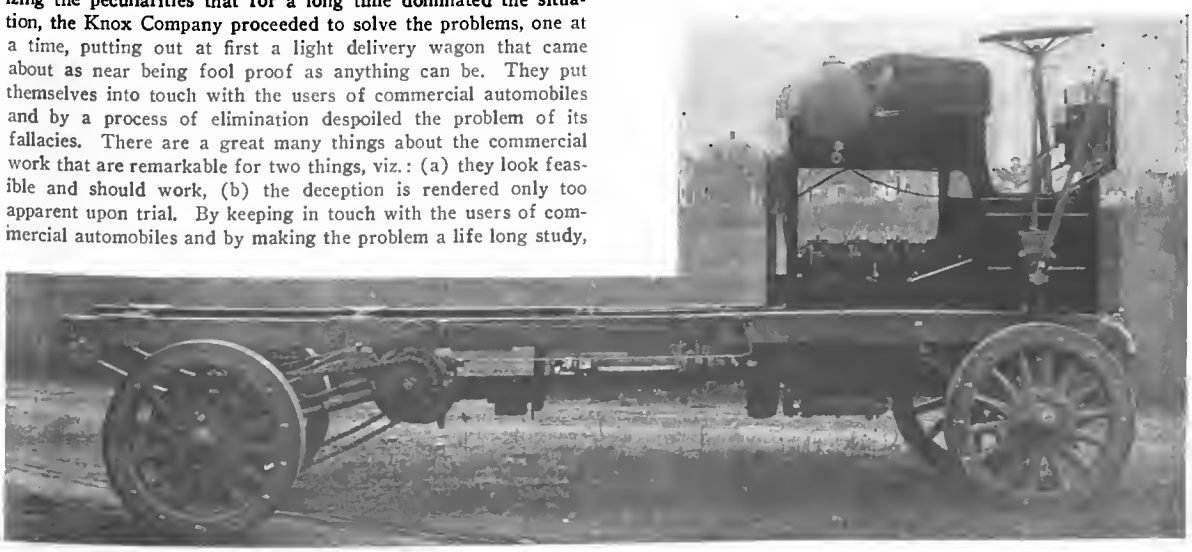
Model 20, Three-quarter-ton Commercial Chassis.

The Knox Company evidently fully appreciated the importance of gradually converting merchants to the idea of the automobile as a means of transportation, and they point out among numerous other conditions, the fact that the transportation managers of the big industries fully realize that horses have to be fed, watered and cared for; but they were horsemen and they were not able to understand that a machine had to be rested, cleaned, oiled and adjusted. Were they to consult a locomotive engineer (these transportation managers) they would be told that a locomotive has life, and wearies in operation just as does any animate thing, hence the locomotive has to be rested, and to be given a small share of the same careful attention as should be accorded an animal.

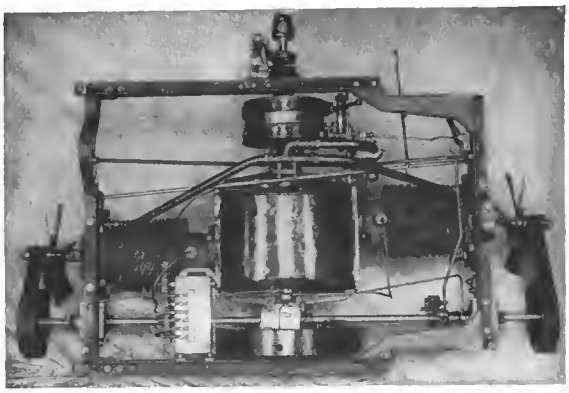
Simplicity and Ruggedness Applies to the Situation.—Realizing the peculiarities that for a long time dominated the situation, the Knox Company proceeded to solve the problems, one at a time, putting out at first a light delivery wagon that came about as near being fool proof as anything can be. They put themselves into touch with the users of commercial automobiles and by a process of elimination despoiled the problem of its fallacies. There are a great many things about the commercial work that are remarkable for two things, viz.: (a) they look feasible and should work, (b) the deception is rendered only too apparent upon trial. By keeping in touch with the users of commercial automobiles and by making the problem a life long study, as it were, the Knox Company were enabled to eliminate the fallacies and to reduce Knox trucks, not necessarily to the point, such as would seem to accord with the views of theorists who do not build trucks, but to a point consistent with the actual requirements to be found on investigation. The Knox Company point out that they did not simply investigate and then build a lot of trucks to fill a long felt want, whereas they did go slow. They built cars and they tried them out; they made the necessary modifications as the result of service and so on, until to-day the Knox line of commercial automobiles covers this zone of activity perfectly.

Model 20 Chassis Rated at ¾ Ton.—This article is illuminated by an illustration of the model 20 chassis, which is a well known and favorably received type of the Knox output. This type is turned out to suit express and other light service, limiting the capacity to 1,500 pounds, in which the merchandise platform is 44 inches wide and 84 inches long. The body may be covered or opened to suit the purchaser. This same chassis is turned out with a panel top delivery body in artistic effect, having the same platform area. The speed of this automobile is 15 miles per hour, with means of regulating the speed down to the lowest required limits. The tread is 56 inches, which is suitable for tracking on street car rails, and the wheel base is 85 inches, thus affording a short turning radius in congested streets.

The frame is angle steel 3x2x1-4 inches, with "I" section front axles of adequate proportions, while the rear axle is 1¾ inch square. Timken roller bearings are used for all road wheels, and the solid tires are 32x3 inches front, and 36x3 inches rear. Semi-elliptic springs are used.



Powerful Five-ton Knox Model 18, Which is Equipped with Fifty-horsepower Water-cooled Motor.



Two-cylinder, Twenty-horsepower Power Plant of Knox D-7.

The motive power is the product of a single cylinder Knox air cooled motor, delivering to a planetary type of transmission gear affording two speeds forward and reverse, thence to a double side chain drive. The clutch is incorporated into the planetary gear and the foot brakes apply thereto. The ignition is by means of a Connecticut coil and timer, utilizing dry cells, while a Lavigne oiler, supplemented by grease cups, takes care of the lubrication. The balance of the equipment consists substantially of a horn and the necessary tools, odometer, a suitable gasoline tank, carbureter of course, while the mud guards as well as the leather trimmed operator's seat are provided with chassis, independent of the body.

Model 18, 5-Ton Truck Equipped with 50-Horsepower Motor.—This truck is the result of a positive demand on the part of merchants for a stout and commodious truck to be used in heavy goods delivery work. The standard platform of this truck is 72 inches wide and 14 feet 6 inches long. The wheel base is 154 and the tread is 67 inches. The truck is geared for 12 miles per hour and uses 36x5 inch solid front tires, with 36x4 inch "daul" solid rear tires. The front axles are 2½x4 inches, "I" section and the rear axles are 2¾ inches square.

The 50 horsepower motor of the water cooled type has four cylinder 5½ inches bore and stroke respectively. The Knox Company resorted to the use of water cooling in this large size, for reasons that are perfectly good and require no further comment. The illustration of the truck will indicate that the motor is situated in the front, in a getatable space under the driver's seat. It will also be observed that the cooler stands out in front of the body work proper with which the water circulation is suitably connected, and a pump is used for the same. The general design and construction of the motor are along lines consistent with the Knox practice, including the oiling system known as DeDion, involving an oil sump in the track case. The gasoline is by gravity feed from a round tank about the motor, back of the driver's seat. From the motor through the clutch to the transmission is by way of substantial, simplified means, and the transmission itself is the selective type, three speeds forward and reverse. The double side chain drive is used, and semi-elliptical springs of ample proportions serve to suspend a 5-inch channel steel frame. As in other Knox cars the road wheels roll on Timken roller bearings, and the chassis equipment is sufficiently complete to check with that as before stated for the model 20 chassis. In this truck, however, there is one essential difference, i.e., the ignition is by means of a magneto, supplemented by a coil and dry cells.

Front Axle and Spring Construction of Knox D-6.

Some Features of Model D-7 Power Plant.—The illustration shows a double opposed air cooled motor, characteristic of the Knox methods, in which the air cooling is very effective. This power plant is self contained, mounted on its own frame, including a planetary transmission with the clutch and speed changes integral. The oiling system is by pressure feed, mounted on the same frame and two fans (one for each cylinder head) are set to pour an air current over the cooling surfaces. This separable power plant may be quickly dropped down and substituted by a new one when desired, thus rendering it feasible to quickly and cheaply make repairs, without keeping the automobile out of service during the interim of repairs. In this way several commercial automobiles may be kept in quite continuous service, utilizing one extra power plant, the same to be kept in good repair and to serve as a supernumerary.

With a view to rendering the subject a little more clear, an illustration of the front axle and spring suspension of one of the Knox types of delivery automobiles is given, which in itself is sufficiently clear to render any further statements and explanations thereof unnecessary. There are certain features that are common to all the Knox products as for illustration, the "wheel steerer" is used on all the models. The side levers are placed to the right of the driver, and in a nice relation. While adjustments are rarely necessary, provision is made for easy access to such parts as may possibly require attention in the course of time. This latter condition is in spite of the fact that the whole power plant can be removed in some of the models, even when repairs are necessary, and on the whole it is the claim of the Knox Company that it has been guided by actual experience, spread over a wide range of commercial pursuits, and that if it has eliminated any features that would seem to be of value, it was influenced by actual experience in harmony with the best phases of theory, modified by practical considerations.

SOME FEATURES OF THE APPERSON TAXICAB.

The regular Apperson "Model O" chassis is used, subject to such modifications as the wide experience of the makers, the Apperson Bros. Automobile Company, Kokomo, Ind., would naturally indicate. To assure continuity of service, a dual ignition system is used, incorporated into which is a magneto and a storage battery auxiliary. For the control, a three-speed selective transmission gearset is used, and the shaft drive leads to a "full" floating rear axle. Of the wheels, there is much to be said in their favor, since they are "dished," and the design is such that the weight is carried on "plumb" spokes.

In view of the modern chassis, it would not be out of place to expect body work of some pretentions. In this relation it is not to disappoint the reader. The body work is of the most modern description, by way of a stylish landaulet, upholstered in fine leather with broad cloth head linings. The top may be pushed back at will, and the design is such that all the windows are concealed within the body work, and the window frames fold down. The taxicab complete sells for $3,000, and while it is primarily a taxicab, it is nevertheless suitable for town-car service, and may be equipped accordingly.

The New Gear Box of the 1909 Darracq Taxicab.

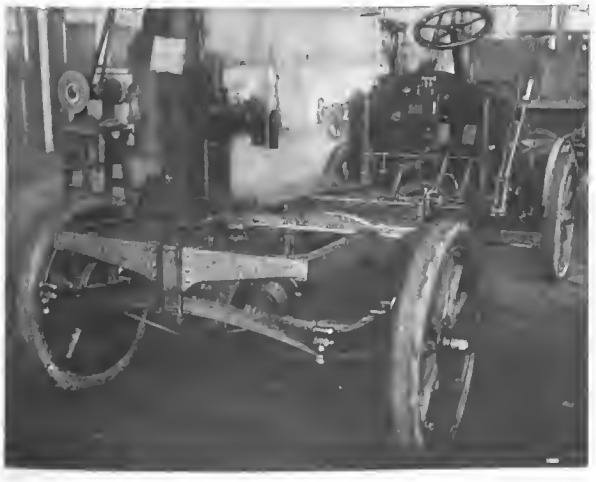
NEW DESIGN FOR 1909 DARRACQ TAXI.

PARIS, Nov. 20.—For 1909 a complete change of design is made on the Darracq taxicabs, well known in the States by reason of their extensive employment in most large cities. The gear-box on the rear axle, which is one of the distinctive features of the Darracq taxi, has been found unsatisfactory for the rough work these vehicles have to perform. It has, therefore, been removed and placed in the usual position to the rear of the engine, and on the subframe carrying the entire power plant. The selective gear change has been abandoned in favor of the straight through type, giving three speeds forward and reverse.

The most important change is in the clutch control. A broad leather-faced cone clutch is still employed, but the spring, instead of being within the cone, is now inside the gear-box and separated from the clutch by means of a stout universal joint. Any slight deformations in the subframe, or a little error in lining up, will not now prevent the proper working of the clutch. The spring itself is contained within a stout tubular housing carrying the thrust bearing, but prevented from turning in the forward extension of the gear box in which it is housed by means of a suitable stud. The clutch pedal operates direct on the outer face of this housing by means of a couple of arms, one on each side of the shaft.

The engine is slightly smaller than last year, but has undergone practically no changes in design. Lubrication has been rendered automatic by the adoption of a Dubrulle dashboard lubricator positively driven off the camshaft. There are two feeds only to the crankchamber. On the previous models the flow of oil was assured by pressure from the exhaust. The engine is in one casting, with valves on one side, and intake and exhaust manifolds integral. There have been a few minor changes on the carburetter, the air inlet being mechanically opened at the same time as the gas intake, in order to abolish the "panting" which sometimes occurred on opening out the engine suddenly after being throttled down. Brake connections have been simplified and are now entirely mounted on the subframe. The brake drums, too, have been increased in size, and are now of the same diameter as those employed on the 60-horsepower cars. Compared with the touring models, the chassis is a particularly robust construction, being considerably deeper and of broader section than any other models produced by the firm.

From the gear box the drive is taken to the rear wheels by means of propeller shaft, differential gear and rear live axle, all of a much stouter construction than on the touring models. A single-torsion rod is carried from the differential housing to a point on the subframe.



Chassis of the Darracq Taxicab for Coming Season.

THE FRANKLIN'S UNENCUMBERED DASH.

A feature of the Franklin models for 1909 will be an unencumbered dash. As will be seen by the illustration the dash is clear of oilers, coil boxes, wires, switches and other devices, and only the magneto button, needle valve stem, and primer rod remain. The oiler is now placed next to the engine base, where it is operated through gear connections with the driving shaft, and the oil is kept fluid by heat from the engine base. The ignition of the Franklin is such as to require no coil box.

New Dashboard of the Franklin.

The toe board is an auxiliary convenience, made as it is in three pieces, easy of removal. These are cast aluminum plates, held in position at the bottom with pins, and at the top with thumb catches. The steering column is free from all levers, the spark and throttle control being operated through the center of the steering tube, the center of the steering wheel forming the base for its operation.

The dash for the six-cylinder cars is made of mahogany; that for the others is finished to correspond with the rest of the automobile. The manufacturer, the H. H. Franklin Manufacturing Company, Syracuse, N. Y., feels confident that the new dash will meet with popular favor.

THE TREND IN WARNER INSTRUMENTS.

The Warner Instrument Company, of Beloit, Wis., has placed on the market a new style auto-meter. The shape is similar to that of an alarm clock, 4 inches in diameter and 2 inches thick. There are four openings on the face, one giving the number of miles traveled on the trip, another the total number of miles traveled since the instrument was started, the third giving the speed per hour, and the fourth is a receptacle for a small electric light bulb to light up the dial at night. It will register 10,000 miles, and a turn of a handle places it back at zero.

THE AUTOMOBILE

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LICENSE THE DRIVERS OF ALL VEHICLES.

The drivers of all vehicles should be licensed. Then police control of traffic in New York and other large cities would be as absolute as it is in London, where the finger of the "Bobby" can stop the progress even of a king. That is the idea of an ex-police commissioner of the metropolis, and the common sense of the proposition is so apparent that it is strange the plan has not been duplicated in this country before.

In the large cities, and especially in New York, Chicago, Boston, and Philadelphia, street traffic of all kinds has assumed such huge proportions that the dangers to the users of the road have multiplied astoundingly, as is shown in the increasing number of accidents. If "every driver of any kind of a vehicle" had to have a license, which was revocable temporarily or permanently, there would be more consideration and a quick decrease in recklessness of those entrusted with the guidance of horse-drawn or motor-driven vehicles.

Before a law of this sort can be put into effect in the average American city, there inevitably must come the creation of a sentiment in favor of it which will convince the politicians that the general public demands it for the common good. There will come a prolonged resistance from the thousands who now guide horses through the crowded streets without any examination as to their qualifications, and whose utter incapacity frequently finds demonstration in the accident reports in the daily papers.

But the automobilists should no longer hesitate to place themselves squarely on record as being in favor of licensing all drivers and the revocation of such licenses for culpable conduct in their use of the streets. The public has been longsuffering, but has reached the limits of its forbearance, according to the signs of the times, and while purging their own ranks, the autoists can see to it that the drivers of horses are included among those who must give more consideration to one another and the man who must cross the road to get on the other side of the street.

* * *

PREJUDICIAL RESISTANCE IN AUTOMOBILES.

The mechanical losses in any automobile may be resolved into two components, viz.: The losses that follow functional activity along lines consistent with the advantages mutual to necessity considering correct design, and the losses in excess due to eccentricities in design. This latter series of losses might well go in the category of prejudicial resistance, or be eliminated.

To what extent prejudicial resistance holds sway in automobiles in general, is a matter that must in the long run receive some attention. If it amounts to as much as 10 per cent. of the power of the motor, it is a large factor, since the fuel required is in the ratio of 100 to 16. In other words, to realize 16 horsepower at the flywheel, fuel to the value of 100 horsepower must be supplied. If 10 per cent. of this goes to prejudicial resistance, inherent in the design, it is a matter of 10 horsepower in fuel to be noted, rather than 1 6-10 horsepower, as might be supposed by those who fail to keep track of the inherent value of the fuel, instead of the mechanical losses.

But there is one other source of prejudicial resistance that sinks the foregoing into peaceful slumber, as a bottle of milk sways the consciousness of an infant. The inequalities of inferior roadways furnish prejudicial resistance on a large scale. The average town car will do well with a 16 horsepower motor, whereas the same car on touring duty over the unkempt roads of America would scarcely make adequate headway on double that horsepower to say the least.

Under these conditions prejudicial resistance foots up to the enormous value of 100-horsepower in gasoline, all of which is chargeable to the ill-kept roads that indicate the need of double the power to do the same work in a satisfactory manner on paved streets.

The average road commissioner is so busy trying to invent a theory to fit the ability of rubber tires to agitate the top dressing of his ill-made roads that it will doubtless be a task to enlighten him on the subject sufficiently to enable him to understand that prejudicial resistance costs the community more than the cost of good roads. Roughly, the extra gasoline required for the 60,000 cars that the State of New York has on license, assuming that each car does 10 miles per day for 300 days per year, would cost enough to pay 4 per cent. on more than one hundred million dollars per annum, which is to take no notice of what the future holds by way of increasing numbers.

EX-POLICE COMMISSIONER WOULD LICENSE ALL DRIVERS

WILLIAM McADOO, a former New York City Police Commissioner, and before that Assistant Secretary of the Navy and also a Congressman, was one of those who spoke at the recent presentation of the Vanderbilt Cup. In his witty and novel interesting speech Mr. McAdoo devoted his remarks largely to the traffic problem and a discussion of how the inevitable and lasting automobile was to be regulated by law. He declared that the solution of the question lay largely with the autoists themselves, who had the power to compel reasonable laws and should have the public spirit to obey them.

"I do not know," said Mr. McAdoo, "whether it was Shakespeare or Roosevelt who said that men must play many parts. I have been a legislator, a sailor and a Police Commissioner. I must say that I felicitate myself that I am no longer a Police Commissioner when I gaze upon this assemblage of 300 law-breakers, with an average of $100 in fines. I am prouder of what I have done to regulate traffic and make the streets safe than anything I may have accomplished. I am proud to have been the one to have established the Brooklyn Bridge safety zone.

"I have been studying traffic control in London this summer from a New York point of view. You autoists and the Burglars' Union are trying to undo the police. I am getting more acquainted every day with the underworld, for you autoists are the greatest aggregation of law-breakers on earth; I will say, however, you are a fairly intelligent lot of law-breakers. One of my first acts as Police Commissioner was to change the caps of the bicycle cops to white. Then the West End Association gentlemen came and told me that the autoists would see the white caps and slow down, and I replied that that was just why I put the white caps on the cops, and if I were Police Commissioner now I'd put red lights on them at night."

Mr. McAdoo then recited a hold-up that the Riverside cops had once made on him, and used it as a text to show how policemen seek to get a record and square themselves for not being on their jobs by filling up a record of arrests made.

"Efficiency in a cop," he continued, "does not consist in making arrests, but in showing good judgment. My idea is to let automobilists hit it up a bit when the road is clear, and hold them down under the limit when the children are coming out of a schoolhouse. (Great applause.) I don't believe in police traps or making arrests. I want the policeman who makes no arrests, but is on his job all the time.

"The London rate of speed is higher than our own, despite the more crowded traffic. One-fifth of our accidents come from violating the law in turning corners. In London they make them turn the corners wide. Our own corner curbs are ground down by illegal short turning. Homecomers tell of the power of the upraised finger of the London 'bobby.'

"The reason for this is that in London *every driver of any kind of vehicle is licensed.* When you ask him to show his license, you have command of the man's living. To regulate traffic in New York properly the police will have to get absolute control of the streets. The mounted cops are the first, the greatest step in this direction. We need to get civilization out of barbarism. The automobile is a part of our civilization of to-day. It is here to stay, and you yourselves must be the ones to curb the reckless.

"I believe that the American automobile is to be the automobile of the future. In the early days of bicycling it was more fashionable to ride a Humber. That was all changed, and with our automobiles, as with our bicycles, we will dominate the world, and before long, mark my word, it won't be fashinable to own a foreign automobile."

TWO IMPORTANT LEGAL DECISIONS IN PENNSYLVANIA

PHILADELPHIA, Nov. 23.—Local automobilists were naturally delighted when, some days ago, Judge Weand in the Montgomery County Court, at Norristown, released an autoist who had been arrested on the charge of overspeeding, the evidence showing that a car bearing the number set alongside his name in the records of the State highway department at Harrisburg had broken the speed laws of Lower Providence township. The judge had based his action on the failure of the prosecution to show that the owner of the car (the purchaser of the tag) had been in the automobile at the time. This decision makes it incumbent on the "trap artists" to prove that the owner was in the car at the time of an alleged offense.

But as if this blow at the roots of a well-paying industry were not enough, Judge Wilbur F. Sadler, in the Cumberland County Court, at Carlisle, last week added to the "trap artists" woe by handing down a decision to the effect that an arrest and fine based on speed made over a measured quarter or half mile, or, in fact, over any other distance than a mile, is illegal. This case also originated in the Montgomery county "trap" district. Albert E. Cauffman, chauffeur for John Kays, a Carlisle attorney, was timed by the "trappers" over a measured quarter, and the calculations having figured out a rate in excess of the limit, a constable was sent to Carlisle who arrested Cauffman. The latter's employer fought the habeas corpus proceeding, and when the evidence was all in, Judge Sadler ruled that it was necessary to give proof that one full mile—the distance specified in the law—had been traversed in less than the State limit (three minutes in the open country and six minutes in built-up sections). The court also read a lecture to justices of a county who make a habit of issuing warrants for service on alleged violators who live outside that county, saying that the law gave them no license to do so. He held, also, that actions for auto speeding are civil or penal, rather than criminal, and that the State cannot be a party to the action. Cauffman was discharged.

These decisions gave evidence that the campaign of the Automobile Clubs of Philadelphia and Norristown, to put a stop to the illegal arrests and finings in Montgomery county, is already bearing fruit.

NEXT YEAR'S GRAND PRIX IN CHATEAULAND

PARIS, Nov. 20.—Angers, in Chateauland, has been officially selected the scene of the 1909 Grand Prix and voiturette race to be held the end of June or early in July. The decision was taken this week by the Racing Board, and immediately confirmed by the full committee of the club. In return for holding the race in their district the local authorities are under an obligation to raise a subvention of $20,000 and to assist in much of the detail work of preparing for the big event. Already the Angers committee has shown a considerable amount of activity, and when they put forth their candidature, presented plans of a suitable plot for grandstands and ravitaillement posts, together with options on the rental; a complete plan for the barricading of the road, with contracts for the work by local firms; options for various plots of land around the course, a guarantee that drinking

water would be supplied, and prices for transporting it; also a written statement from the roads department that the entire course would be put into condition for racing early in the new year.

The Racing Board has become wise as the result of years of experience in organizing races, and this year has withheld its decision until terms had been arranged for the rental of every plot of land, and for every piece of work that will have to be accomplished. As there are a dozen districts desirous of obtaining tbe race, competition makes it impossible for overcharging to be indulged in. It is declared that tbe club has also on foot a big scheme by which all the hotel proprietors will agree to a fixed tariff for food and lodging during the period of the races.

It is roughly a triangular course 46.18 miles round that has been selected on the banks of the Loire, to the west of Tours and Saumur. As, in all probability, ten rounds will have to be made, the total distance will be 461.9 miles. The voiturettes will probably be required to cover six rounds, or a total distance of 277.08 miles. Although one side of the triangular course is rather narrow and winding, fast time can be made, and even with the 130 millimeters limit an average of 70 miles an hour is anticipated.

Only one matter in connection with the annual race now remains to be settled: whether tires shall be changed by hand or with the aid of dismountable rims and wheels. The International Association was unable to come to a decision on the point and left the matter over to another meeting to be held in Paris during the Salon. The majority of those interested appear to favor the use of both dismountable rims and wheels.

THE 1909 INTERNATIONAL RACING RULES.

By A. L. RIKER, Vice-President Locomobile Company of America.

ALL racing cars built abroad for the season of 1908, by virtue of an international ruling, were restricted in design as to their cylinder bore. For the Grand Prix and other events intended for large cars the bore was 6.1 inches; for the English Isle of Man contest the limitation was 4 inches—tbus the name, "Four Inch Race." Similarly, the bore of the cars constructed for the small-car race run on the day preceding the "Grand Prix" were restricted. In spite of these limitations, the cars were speedy, and notably high averages were made. In fact, the average time made by the winner of the "Bresia circuit" is a new record, faster work than has ever been accomplished before with a motor of unlimited bore or stroke. The Grand Prix was won at an average of 69.2 miles per hour; the Voiturette race the day before tbe Grand Prix at an average of 50.02 miles per hour.

At first thought it would appear that the tendency to limit the size of racing motors in this manner is most admirable, but when a study is made of the strokes of the foreign racing cars of 1908 it would appear that many of the motors are in reality freaks, particularly when it is considered that the short-stroke motor is gaining ground all the time, and that a few years ago, when the bore was unlimited, the foreign designers made the short stroke in preference.

For 1909 the Europeans have decided to reduce the bore still further, from 6.1 inches to 5.1 inches. It was hoped that some limit would be placed on the stroke, because The Automobile Club of America, in reply to the request of the racing powers abroad, advised a classification by volume, a most sensible thing. The wisdom of this plan would be obvious to all; it not only places four and six-cylinder motors in the same class, but it encourages rational motor design and the building of cars that will have a commercial value after the race.

A four-cylinder motor of 5.1 bore and a reasonable stroke, say six inches, is a very good size, and a manufacturer could easily turn such a racing car into a stylish and speedy roadster with little trouble, and the result would be a car that could contain all tbe value the race could offer in the way of experience, and instead of being a freak would be a logical new model, perfectly tested. Just what a 5.1-inch motor with an extravagantly long stroke would be good for after the racing season, with the rules changing every year, is difficult to see.

The foreigners can very well afford to build such cars, owing to the large number of events held every season that are open to just such specially built racing cars; moreover, the motor car advertising on the continent is largely limited to contestants, and the makers can affort to go to greater expense than we, as they do not have so many automobile shows, do not have to do so much advertising in the newspapers and magazines—and, what is more important, the advertising they do is highly effective, owing to the relatively small and densely populated areas as compared with the United States.

The point might be made that a few of the racers built abroad for the 1908 racing season did not have abnormally long strokes. It is reported that the winner of the Grand Prix had cylinders of 6.09 inch bore and a stroke of 6.68 inches. But it must be considered that 6.1 inch bore is large and a real racing dimension, and it was not found necessary to lengthen out the stroke very much. Now for 1909 the bore is greatly reduced, and in order to make a fast car the designer is almost certain to build a very long stroke motor, like the cars in the Four-Inch Race in England or the Voiturette Race in France.

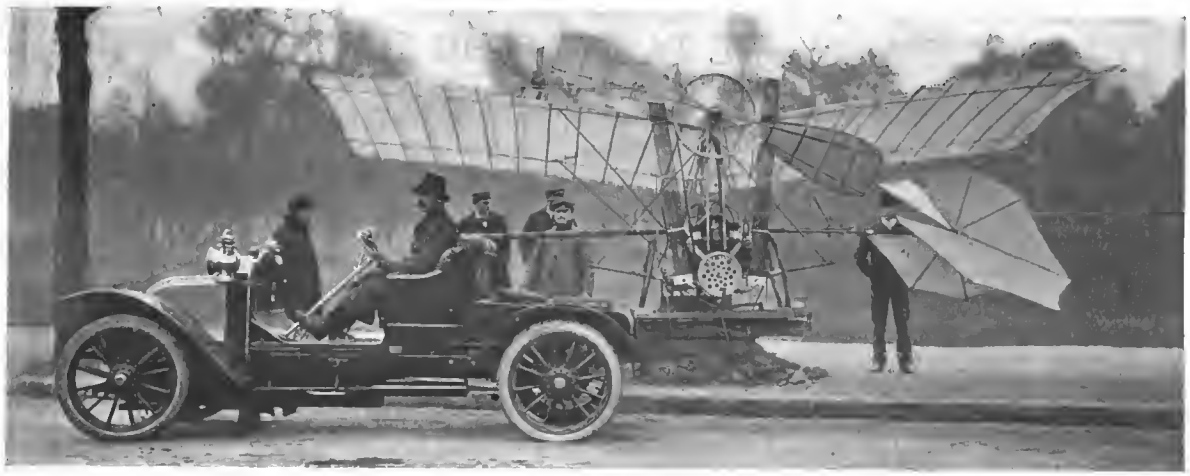
What is the position of the American manufacturer to-day who has a desire to build a car that can win the Grand Prix of 1909? Simply this: He must build for racing purposes only one or more freak cars. He cannot compete with the foreigners unless he does; if he does not lengthen out the stroke to some absurd point his cars will not have the speed of the foreign cars; he will not be racing on equal terms with them, and he will be beaten.

What, then, will be the attitude of the automobile public toward American manufacturers who are in sympathy with racing, experienced at it, but who do not care to build freaks, from whose motor performances they will learn little or nothing? Most likely it will be considered that they are "dead slow," or unpatriotic, or afraid of the foreigners. Not in the least. The American builder has had nothing to do with the formation of the 1909 racing rule, beyond an unheeded protest made by him through the medium of the A. C. A.

Is it too late to gain a reversal of the rule? If the volume could only be limited instead of the stroke it is certain that a large number of splendid fast American racers would be built, and their performances would prove the mettle of the American designer in a more impressive and conclusive manner than ever before. The present situation is more than unsatisfactory, but if it can be explained and thoroughly understood there is that much accomplished.

PENNSYLVANIA ROAD BUILDING LOOKS GOOD.

Harrisburg, Pa., Nov. 24.—In the annual report of the State Higbway Commissioner of Pennsylvania, Josepb W. Hunter, made public on Monday, there is contained a recommendation for an annual appropriation of from $4,000,000 to $5,000,000 a year, for ten years, to build roads and to outline a system of main bighways for the State. During the year 325.2 miles of roads were completed and 221 miles were under contract. During the present year much of this work has been completed, and Pennsylvania now boasts of over 700 miles of State road, with petitions in for the coming year for almost that much more road, and prospects of a great increase if the legislature passes a bill allowing a larger appropriation.



Santos-Dumont Off to St. Cyr with His New Aeroplane Strapped to His Runabout.

SANTOS-DUMONT TO FLY AGAIN IN NEW AEROPLANE

PARIS, Nov. 20.—Santos-Dumont, the first man in Europe to make a mechanical flight, has returned to the flying game after an absence of over a year, his new machine having the record of lightness and smallness. It is a tiny monoplane that has been christened the *Butterfly*, but which might have been more correctly termed the *Dragon Fly*. The two wings, only 16 feet from tip to tip, and formed of a wooden frame covered with fine varnished silk, are mounted on a metal framework carried by three bicycle wheels. The motor, not more than six inches from the ground, is an eight-cylinder 24-horsepower Antoinette, driving a two-bladed propeller, also of wood and silk, by means of a broad belt. The driving pulley is keyed to the fore end of the engine shaft, and the driven pulley is three feet above it in the angle formed by the two wings. The speed of the propeller is 700 revolutions a minute. Two packets of plain aluminum tubes mount up on each side of the engine and the propeller for the circulation of the cooling water. The pilot's seat is immediately behind the engine, and under the wings, not more than five or six inches from the ground.

Compared with Farman's aeroplane, tbe Santos-Dumont is but a toy, for the former has a bearing surface of 195 square feet, while the latter has but 29. To prove the handiness of his flying machine, Santos-Dumont dismounted the long bamboo tail carrying the rear rudder, mounted the whole apparatus on the rear platform of his little two-cylinder runabout, and drove off with it to St. Cyr, 12 miles away. The first attempt at flight resulted in the breakage of one of the wheels. The Brazilian aeronaut declares that he hopes to have his machine thoroughly tuned up and be in proper condition for the first aeroplane races to be held at Monaco next January.

BORDEAUX-PARIS AEROPLANE RACE.

PARIS, Nov. 20.—Still another aeroplane race for 1909, the latest event to be run from Bordeaux to Paris, distance by road 329 miles, in five daily stages of about 60 miles each. The stages are Angouleme, Poitiers, Tours, Orleans and Paris. There is a certain historic charm to the French in holding an aeroplane race from the western wine city to Paris, for it was between these two towns that the world's first automobile race was ever held, when Levavassor drove continuously for almost 49 hours, away back in 1895, and where De Knyff, Henry Fournier, Charron, Louis Renault, Farman and Girardot struggled for victory in 1899 and 1901, and where many an automobile and bicycle race was held during that "heroic" period when France was always on top.

No regulations have yet been drawn up for the aeroplane race, nor has the date been fixed, but it is believed that the race can be held during the summer of 1909, or at latest in 1910. The difficulty at present is not the lack of aeroplanes, for there are without doubt 250 flying machines under construction in and around Paris, but the need of men to pilot them. Apart from Wright, Farman, Delagrange and Bleriot, there are very few men in France who have had any experience aloft, and if some of the races projected for the coming season fail to materialize it will be entirely because of tbis lack of experienced men.

An aeroplane race across Paris, which was announced by *L'Auto*, has been withdrawn in favor of Bordeaux-Paris, the organizers recognizing that it was dangerous to the general public to invite flying machine pilots to pass over a crowded city.

AERO CLUB OF NEW ENGLAND MEETING.

BOSTON, Nov. 23.—The Aero Club of New England on Saturday evening celebrated its first anniversary, and incidentally observed the 125th anniversary of the first ascent by man in a balloon, with a dinner at the Boston City Club. There was a good attendance of members and a number of guests whose fame as aeronauts is international. Professor A. Lawrence Rotch presided, and the speakers included President A. Holland Forbes, of the Aero Club of America, and Augustus Post, wbo competed in tbe recent international race in Germany; N. H. Arnold, also a competitor in the international race; Mayor George A. Hibbard, of this city; Charles J. Glidden, W. K. Morrison, of Minneapolis, who recently made an ascent of 11,100 feet; and Vice-President T. E. Byrnes, of the New York, New Haven & Hartford Railroad. Letters were read from Professor Alexander Graham Bell and Orville Wright.

Before the dinner a business meeting was held, at which the following officers were elected: President, Professor W. H. Pickering, of the Harvard astronomical observatory; first vice-president, Frank E. Stanley; second vice-president, Frank B. Comins; secretary, Alfred R. Shrigley; treasurer, Harry G. Pollard; directors, Professor Pickering, Vice-Presidents Stanley and Comins, Henry Howard, T. E. Byrnes, W. P. Harris, and Winfield S. Shrigley; foreign representatives, Professor Rotch, Charles J. Glidden and J. C. McCoy; contest committee, Henry Howard, W. E. Eldredge and Henry A. Morss; ascension committee, Charles J. Glidden and H. H. Clayton, of the Blue Hill observatory; aeronautical engineer, Leo Stevens.

WHAT CLUBS ARE DOING THE COUNTRY OVER

NEW AUTOMOBILE CLUB FOR SAN FRANCISCO.

San Francisco, Nov. 19.—Automobiling in this city took a new lease on life last night, when the organization of the San Francisco Motor Club was completed and officers elected. A number of the younger element among the trade and also owners in the city felt that they wished an organization which should be primarily for pleasure and promoting of touring and speed contests, and not in any way to conflict with the work of the older clubs at present doing such good work for road improvement and posting of highways.

The election of officers resulted in Fernenado Nelson, who has twice lowered the record between San Francisco and Los Angeles, being chosen as president. Charles S. Howard, the head of one of the local automobile companies, is first vice-president, and William M. Klinger, second vice-president. Frank E. Carroll, of former bicycle and motorcycle fame, is secretary, and C. E. Starrett, treasurer.

With the completion of the election of officers the club immediately proceeded to lay its plans. Tony Nichols, as head of the contest committee, brought up the subject of an annual road race, and reported that he thought by careful management the county supervisors could be interested in the scheme, especially so, if the club was willing to give the profits of the race towards road improvement. It was decided to hold a short run to one of the many picturesque spots near the city before the Winter rains set in, making it a sort of picnic outing, the object being to bring all the signers of the constitution together.

WEBB NOMINATED FOR L. I. CLUB PRESIDENCY.

Brooklyn, N. Y., Nov. 23.—Frank G. Webb, vice-chairman of the A. A. A. racing board, has been placed in nomination for the presidency of the Long Island Automobile Club. Nominations for other officers to be voted for at the annual meeting of the club, which will be held December 10, are as follows: Vice-president, William Schimpf; secretary, Herbert G. Andrews; treasurer, Charles C. Cluff; governors for term of two years, Alfred Wilmarth, Dr. A. C. Howe, and Charles Jerome Edwards; membership committee, Walter L. Webster, William G. Morrison.

The nominee for president, Mr. Webb, is one of the best known automobilists in the United States, and has served with great credit and efficiency on the racing board of the American Automobile Association for several years. He will make a capable official at the head of the club, and his nomination will prove deservedly popular.

The annual dinner of the club will be held Thursday evening, December 10, and will be of the nature of a "beefsteak feast," to be followed by a high-class vaudeville entertainment.

MILWAUKEE A. C. CLOSES OUTDOOR SEASON.

Milwaukee, Wis., Nov. 23.—Nine machine loads of members of the Milwaukee Automobile Club participated in the last tour of the season on November 21, the occasion being the western championship football game between Chicago and Wisconsin at Madison, Wis., and the institution of the Green County Automobile Club into the Wisconsin State A. A. affiliated with the A. A. A. Ten other machines accompanied the nine as far as Madison to see Wisconsin get its annual whipping, this time by the score of 18 to 12. From Madison the nine machines went to Monroe for the jollification and returned to Milwaukee Sunday night.

The club is planning to keep the interest up during the winter by a series of indoor events with the hope that when spring comes and the new clubhouse is ready for occupancy the membership will be materially increased.

HARRISBURG CLUB PLANS ROADS CAMPAIGN.

Harrisburg, Pa., Nov. 23.—The Motor Club of Harrisburg is planning an active campaign for the betterment of roads in Pennsylvania, and has elected one of its vice-presidents, C. C. Cumbler, as a member of the Legislature, while the other three members of the county of Dauphin are pledged to support all fair bills for good roads and especially an increased appropriation for the road building work.

The Motor Club has recently erected over one hundred sign boards throughout the surrounding country, showing the way to and from the city to all outlying points in the State. This work was carried on by a special committee consisting of J. Clyde Myton, James McCormick, Jr., and Dr. John Oenslager. The contest committee through its secretary, W. R. Douglas, is planning for a big endurance test next May which the club hopes to make one of the greatest contests of the year in the East. Numerous promises of support have already been received.

ELMIRA AUTOMOBILE CLUB ELECTS OFFICERS.

Elmira, N. Y., Nov. 23.—New life was infused into the members of the Elmira Automobile Club at the annual meeting for the election of officers. The constitution and by-laws were amended, making the annual meeting in April, and reducing the entrance fees and dues. This was done in order to make it possible for every automobile owner in the city to become a member of the club. Elmira has as large a number of autoists as any city of its size in the country, and if the plans of the newly elected officers are carried out with the aggressiveness shown at the meeting, the club will have a correspondingly large membership in the near future. The following is the list of new officers: President, Clay W. Holmes; vice-president, F. N. Dounce; secretary, Fred H. Rees; treasurer, Edward B. Crocker.

HUB DEALERS AGAINST RECKLESSNESS.

Boston, Mass., Nov. 23.—Believing in the stand taken by the Springfield Automobile Club against reckless driving, a number of the Boston dealers have joined in the crusade by placing notices in their garages and repair shops warning all their drivers that any of them detected in the act of reckless driving will be discharged. The dealers recognize the fact that unless something is done to check the growing tendency of a few drivers to disregard the rights of others, more severe legislation will be enacted, which will only serve as a temporary setback to the progress of the automobile. They have taken this method of showing how they stand on the subject by doing all in their power to control the drivers over whom they have jurisdiction. The good work in this direction that has been inaugurated by the clubs should be emulated in every city where the trade is organized.

TO ORGANIZE FLORIDA STATE ASSOCIATION.

Tampa, Fla., Nov. 23.—At the recent meeting of the Tampa Automobile Club the most important subject which came up for discussion was the proposal, made by President Bryan, to organize a State association under the auspices of the American Automobile Association. Extracts were read from the rules of the national body relating to the formation of State associations. The plan met with such favor that a committee was appointed to confer with similar committees from the Jacksonville and Daytona clubs to carry the project to completion. The meeting was the largest in the club's history, and a great deal of interest was manifested in all the proceedings, especially so in regard to the plans of road improvement as put forth by the good roads committee.

MARYLANDERS HOLD THEIR FIRST HILL CLIMB

BALTIMORE, Nov. 21.—W. W. Lanahan, with his 60-horsepower Stearns car, carried off the laurels at Maryland's first hill climb, which was held under the auspices of the Automobile Club of Maryland. Out of the six events, Mr. Lanahan's car was the winner in three. In one of these, that for the free-for-all, his car made the best time of the day. The car, which was driven by Wilfred Smith, covered the distance of six-tenths of a mile in 43 1-2 seconds. The other events in which this car was the victor were Classes F and H. In the last race Mr. Lanahan was the driver, and he took the car over the course in 46 seconds flat. In the other event Mr. Smith made the distance in 45 1-2 seconds.

The Chalmers-Detroit cars made the next best showing, carrying off the first and second contests, their time being 1:03 1-2 and 54 1-2, respectively. The first event was won by this make of car in consequence of the actual winner, the 30-horsepower Stoddard-Dayton machine, entered by L. H. Shaab and driven by J. L. Cassard, Jr., being disqualified. Harry A. Tate, driver of the Chalmers-Detroit car, protested on the ground that the Stoddard-Dayton car had on it a magneto which was not included in the list price, and which would have carried the price of the car above that allowed for this class, $1,251 to $2,000. After an investigation, the judges decided in favor of the Chalmers-Detroit driver.

The hill on which the climb took place is the Belvidere avenue hill, between Falls road and Roland avenue, Mount Washington. It is an extremely steep affair, and it was necessary for the cars to make a change of gear on several occasions between the start and finish. The starts were all flying ones, and the trophies consisted of silver cups to the winners of each event. More than 2,000 people were lined along the course of the climb, while numerous autos were also to be seen along the way, which were filled with enthusiastic spectators. The summaries:

CLASS A—FOR CARS SELLING FOR $850 AND UNDER.

1.	Ford	15		Withdrawn

CLASS B—FOR CARS SELLING FROM $851 TO $1,250.

1.	Cameron	20		Withdrawn

CLASS C—CARS SELLING FROM $1,251 TO $2,000.

1.	Stoddard-Dayton	30	J. L. Cassard, Jr.	1:01 1-2*
2.	Chalmers-Detroit	24	H. S. Tate	1:03 1-2
3.	KisselKar	35	J. F. Heaver	1:05 1-2
4.	White Steamer	20	L. W. Trembiay	1:09
5.	Mitchell	30	W. P. Shuler	1:20

*First, but disqualified. Race given to Chalmers-Detroit car.

CLASS D—CARS SELLING FROM $2,001 TO $3,000.

1.	Chalmers-Detroit	40	W. C. Hood	:54 1-2
2.	Stevens-Duryea	24	Jack Sperry	:55
3.	KisselKar	54	J. L. B. Wilhide	1:04
4.	Winton	48	W. L. Duck	1:09 1-2
5.	Locomobile	20	Joeeph Paimer	1:36

CLASS E—CARS SELLING FROM $3,001 TO $4,000.

1.	White Steamer	30	Harry E. Mayer	Withdrawn

CLASS F—CARS SELLING FROM $4,001 AND OVER.

1.	Stearns	60	Wilfred Smith	:45 1-2
2.	Stearns	60	Wilson Rutherford	:46 1-4
3.	Stearns	60	Leo Shaab	:49 1-4
4.	Stearns	60	J. G. Nassauer	:52
5.	Winton	45	J. Basilicato	1:18

CLASS G—CARS DRIVEN BY AMATEURS, $3,000 AND UNDER.

1.	Ford	15	Osborne I. Yellott	1:05
2.	Winton	48	H. H. Heyser	1:10 1-2

CLASS H—CARS DRIVEN BY AMATEURS, $3,001 AND OVER.

1.	Stearns	60	W. W. Lanahan	:45
2.	Stearns	50	J. G. Nassauer	:51 1-2
3.	Stearns	60	S. A. Nattans	Withdrawn

CLASS K—FREE-FOR-ALL.

1.	Stearns	60	Wilfred Smith	:43 1-2
2.	Stearns	50	Wilson Rutherford	:45
3.	Stearns	60	J. G. Nassauer	:48
4.	Chalmers-Detroit	40	W. C. Hood	:50
5.	Stanley	10	H. W. Gill	:50 3-4
6.	Mitchell	30	W. P. Shuler	1:23 1-2
7.	White Steamer	30	L. W. Tremblay	1:34

SAID BY MEN PROMINENT IN THE INDUSTRY

David Fergusson, Mechanical Engineer, of the George N. Pierce Company, has just returned from abroad, where he visited the principal automobile factories of England and France, having inspected the new models of the leading German and Italian makes of cars. As a result on his observations Mr. Fergusson says: "Two tendencies in construction stand out prominently above all others. The first is the wide adoption of the shaft drive among makers who have, heretofore, produced none but chain driven cars, and the other is the abandonment of hall hearings for crankshafts in favor of plain bearings, in notable instances. The most prominent general tendency aside from the matter of final drive is the reversion to plain bearings. Several years ago two manufacturers, one French and the other German, both of whom stood high in their own countries, adopted ball bearings for the crankshaft. The outcome of their policy was watched with a great deal of interest by automobile makers throughout the world. This year marks the definite abandonment by them of their experiment, and their return to plain hearings."

C. F. Jensen, President of the National Retail Automobile Dealers' Association.—"Since leaving my headquarters in Joliet, Ill., I have seen a great many agents and they are all signing up for a great many more cars next year than ever before. It is remarkable how many agents in the small towns are contracting for 50 to 150 cars and declaring there is no question of their ability to dispose of them. The farmers in Kansas, Iowa, Nebraska, and Minnesota, are in fine financial shape and ready to buy cars, although the moderate priced machines will be most in demand among them. The cars selling for $1,200 or less are taking very well. while there is a steady demand for the high wheel buggy type. Our Dealers' Association is growing rapidly; the agents for cars appreciating the fact that many advantages can be secured by co-operation. There are many abuses in the trade which the Association will try to remedy and in doing so, we believe the manufacturer will he benefitted as well as the dealer. We are trying to help the agents to secure the agencies for cars in which there is a good profit and a fair working hasis." Mr. Jensen arranged for the automobile show at Grand Central Palace to be the headquarters for the Dealers' Association in New York and for each memher of the Association to have the courtesies of the exhibition.

Maxwell-Briscoe Motor Company, Through President Benjamin Briscoe, sets at rest the many merger rumors that have figured in the columns of the press of late. According to Mr. Briscoe's statement the Maxwell people are not involved in any merger negotiations whatever, nor do they know of serious negotiations being carried on elsewhere in the industry. As far as the Maxwell product is concerned, it will he turned out in three factories of the company, namely; New Castle, Tarrytown, and Pawtucket, and the output will he sold just as heretofore.

H. R. Averill, General Sales Agent, York Motor Car Company, York, Pa., returning from an extended trip through New York and the New England States, predicts that the 1909 season will be one of the greatest in the history of the automobile. While on his trip Mr. Averill met some of the most prominent auto dealers in the northeastern section of the country whose opinion it was that the 1909 season would be a record breaker. Pullman models are much in demand, and during the coming season more than 400 cars will he turned out.

DECORATIVE FEATURES OF PALACE SHOW.

A representative of the S. R. Ball Company, which has the decorating contract for the A. M. C. M. A. show which opens in the Grand Central Palace, New York City, on New Year's Eve, has returned from a trip abroad, where he has been looking up ideas to be embodied in the decorative scheme of the show. One of the artistic features will be 12 full-size statues of a woman holding above her head an automobile wheel with flying wings. These figures of white ivory composition draped in flowing robes will look down upon the main floor from the lower balcony. Other statues of mucb larger dimensions will be placed in the lobby, main stairways, and throughout the main court. The plans, if completed as mapped out, will mark a distinct advance, from tbe decorative standpoint, over anything that has previously been attempted in the automobile sbow line.

Goddess of Speed.

One of the 12 figures that will adorn the first balcony of the Grand Central Palace.

TEN NEW AUTOS A DAY.

AKRON, O., Nov. 23.—The International Harvester Company is turning out ten light-running automobiles a day at its factory in this city, and a daily sigbt is the running of test cars on the streets and highways. Tbe cars are used to test the engines, and each engine is run daily about 100 miles, ten cars being run every day. The same cars are used all of the time, new engines being put in daily. The roads in this vicinity are also used extensively by the Peerless factory in Cleveland, and it is for test purposes as well as for quick passages between the two cities that autoists of Cleveland and Akron are anxious to have Brecksville and Akron connected with a paved or macadamized road, as is now under consideration, in order to have an improved road all the way througb.

YORK'S AUTO PLANTS GET BIG ORDERS.

YORK, PA., Nov. 20.—York's automobile trade is enthusiastic, and large orders are received daily by the two local plants. The Pullman plant is running full time, having many large orders booked for the new 1909 cars.

The Hart-Kraft Motor Company, manufacturers of light gasoline delivery wagons, have entered into an agreement with the Post Motor Company, 1623 Broadway, New York, by which more than 1,100 wagons are to be erected and delivered for the metropolitan trade.

INDIANA DEALERS HAVE SUCCESSFUL YEAR.

INDIANAPOLIS, IND., Nov. 24.—Local dealers are just closing the most successful year in their history. This may seem a bit strange, in view of the recent financial stringency, but is nevertheless true as proved by tbe registration records of tbe Secretary of State.

The number of automobiles sold to Indianapolis people to November 15, this year, is 389. The total number sold in the State has been approximately 3,100, and it is estimated that about 50 per cent. of the automobiles sold in Indiana go through local dealers. It is probable that the total automobile business done by the dealers this year will reach $1,500,000.

DECORATIONS FOR THE GARDEN SHOW.

Since the big automobile shows began to be held in Madison Square Garden, each successive year has witnessed a marked improvement in tbe decorative scheme used for the occasion until, during the last four years, tbe interior of the famous old exposition hall has been made notably more magnificent for the exhibit of motor cars than for any other event in the place. A praiseworthy fact in connection with tbis dressing of the place is that the progress has been from the merely elaborate and ornate toward the chaste and elegant. At the forthcoming show, January 16-23, under the auspices of the Association of Licensed Automobile Manufacturers, the step in tbis direction will be more marked than ever before. There will be magnificence and elaborateness, but tbere will be less profusion, more simplicity and more richness in the general scheme. There will be a gratifying lack of the plaster statues seen in former years, and a tone of more solidity will prevail, as being more becoming to the standard makes of the oldest automobile makers that always comprise the Garden show. One of the few really showy pieces of decoration this season will be a sort of Garden fountain near the Madison avenue entrance. This is in the form of a low abutment of gray stone, curving about the first exhibition spaces facing tbe entrance. It will bave a trough-like basin, into wbicb water from griffin mouths will spray upon the electrically iridescent pool beneath and this falling water, too, will be electrically radiant. In the pool of the curving basin there will be goldfish and pond lilies, some of the lilies natural and some artificial. From tbe artificial flowers electric lights will radiate, while a concealed row of ligbts under tbe coping of the trough illuminates the falling spray.

New Emblem of the A. L. A. M.

Curved, Troughlike Electric Fountain that Will Be Near the Entrance at Madison Square Garden Show.

News in General

Chinese Ambassador Wu Ting Fang Rides in Eugene Christian's White Steamer.

Doubting Thomas Caved In.—The Rapid Motor Vehicle Company, of Pontiac, Mich., is circulating a story of "Doubting Thomas," who rode in the 1908 Glidden Tour in a Rapid truck. As the story goes, it was Thomas (not the truck) that "fell." The little pocket edition is in itself a work of art, aptly illustrated, and the performance of the Rapid truck is portrayed in terse, brisk terms. The theme is but a fitting presentation of what was at the time considered a remarkable performance. If touring cars came through with a clean score, it was but a normal expectation, but few were the critics that reflected a clean score for an overloaded truck under the savage punishment meted out. At the end of the tour the Rapid truck made for home under its own power over even worse roads than the "Glidden orbit," and arrived in good time, covered with well-earned glory and a smear of mud.

Diamond Company Paves a Street.—Although Akron, O., has profited a great deal from the rubber business, the Diamond Rubber Company feels that, by a recent agreement with the city authorities, it is able to help out the city in a very direct way. Desiring the vacation of a small part of a street in order to extend one of the new buildings, the company agreed to pave the remainder of the street in return, and the city accepted the proposition.

Something New for Auto Buyers.—The Winton Motor Carriage Company has issued its latest booklet under the title "Twelve Rules to Help Buyers," in which, as this head indicates, will be found a dozen methods as set down by the Winton Company which should be used when determining the merit of any automobile. Simplicity and freedom from all technical terms is the keynote which should make this interesting to the prospective buyer.

Petrel Motor Car Company a New Concern.—Through an error made in THE AUTOMOBILE issue of November 19, it was said the above named company was a reorganization of the defunct Earl Motor Car Company, of Kenosha, Wis. The plain facts are as follows: The Petrel Motor Car Company is a new organization and has no connection whatever with the defunct Earl concern excepting that the old Earl plant was purchased.

Cleveland to Have Taxicab Service.—The Citizens' Taxicab Company, of Cleveland, is making arrangements to put taxicabs on the streets of that city. It is announced that the Chalmers Detroit Motor Company, of Detroit, will furnish twenty of these taxicabs, ten of which are to be in service by the first of the year. The Charles B. Shanks Company, of Cleveland, will back this new venture.

Cleveland Motor Car Company's Officers.—At a meeting of the board of directors of the Cleveland Motor Car Company at the offices, 1659 Broadway, New York, on Friday, Nov. 20, the following officers were elected for the ensuing year: President, James Laughlin, Jr.; vice-president, James Laughlin, 3d; general manager and treasurer, James B. Strawbridge; secretary, Sidney H. Veal.

Speedwell Company Puts on Night Force.—The announcement comes from Dayton, O., that the Speedwell Motor Car Company of that city has found it necessary to put on a night shift. General Manager Loomis says that now Taft has been elected he feels more certain than ever that his company will be one of Dayton's largest industries in the near future.

Bergman Tool Company, Buffalo.—The Bergman Tool Company has bought property on Niagara street, Buffalo, where it is building a three-story concrete structure for the manufacture of wrenches, pliers, braces, etc. The National Sales Corporation, of New York, Chicago and Buffalo, has been appointed factory sales agent to the trade.

Union Pacific Gasolene Cars.—The gasolene motor coach business of the Union Pacific Railway Company has assumed such proportions that an independent company has been formed for their manufacture, known as the McKeen Motor Car Company, of Omaha. Connecticut coils, timers and indicators are used on all these railway motors.

Schaub Automobile Motor.—On page 695 of THE AUTOMOBILE, November 12, among other statements the rating of the two-cylinder Schaub motor was given as 4-horsepower. Later advices from the Schaub & Son Machine Company, 3064 Henshaw avenue, Cincinnati, O., is to the effect that this particular motor is rated at 10-horsepower.

Palace Show Will Have an Orchestra.—The brass band usually in evidence at former automobile shows will not be heard at the Palace show, which opens New Year's Eve, in New York. Instead the committee has provided for a full orchestra of twenty-five pieces, using only string instruments.

Road Work in the Southwest.—The automobile traffic between Silver Bell and Tucson, Ariz., has increased to such an extent that the old road connecting the two cities did not suit the auto owners, who have been able to get a better and shorter road constructed for them.

Count Goes Back to Japan.—Count Tsatsuma Ninagawa, who was sent to the United States by the Japanese Government to learn the automobile business, has left Dayton, O., where he has been for the past year in the shops of the Speedwell Motor Car Company.

Bus Lines Prosperous in the West.—M. S. McArthur and Neil Hinckley have been so successful with their bus line between Los Angeles and Palo Verde that they will increase the service by the addition of two 50-horsepower Apperson touring cars.

Hayes Wheel Company.—The Hayes Wheel Company has been organized with C. B. Hayes as president and general manager, to take over the plant and machinery formerly owned and operated by the National Wheel Company, Jackson, Mich.

Continentals at the Olympia.—One of the first bits of news to reach this country from the Olympia Exhibition, in London, is to the effect that out of 2,218 tires shown, 678, or 30 per cent. of them, were Continentals.

More Room for G. & J. Company.—The G. & J. Tire Company, of Indianapolis, has broken ground for the erection of an addition to its factory which will increase the floor space by 50,000 square feet.

Kissel Company Increases Capital.—The Kissell Motor Car Company, of Hartford, Wis., has filed an amendment to its articles of incorporation, increasing its capital stock from $100,000 to $200,000.

IN AND ABOUT THE AGENCIES.

Federal Tires, Boston.—The Standard Tire & Rubber Company, with offices and salesrooms at 102 Portland street and warehouse at 84 Chardon street, Boston, will soon announce the opening of an uptown branch to take care of the automobile trade in the sale of the new Federal tire handled by this company. The tire is made by the Federal Rubber Company, of Milwaukee, of which William P. Cronin, at one time manager for the Diamond Rubber Company, is president, and James S. Waddell is treasurer. Osborne S. Tweedy, formerly with the Diamond Company in Chicago, has been appointed sales manager, and Otis R. Cook, for twelve years with the F. R. Goodrich Company, will be manager of the tire department.

Delauney-Belleville, New York City.—J. J. Mann, for the Delauney-Belleville Company, of St. Denis, France, has completed arrangements with Brewster & Company, Broadway and Forty-seventh street, New York City, to act as agents for these cars in all the Eastern States. The body-building facilities of this concern should be a large factor in properly placing the Delauney-Belleville cars before the public.

Stearns and Midland, Milwaukee.—The Wisconsin Automobile Exchange, State agents for the Stearns and Midland lines, has moved to its new and permanent quarters at 239-241 Wisconsin street, adding another big agency and garage to the East Side motor row in Milwaukee. The repair line will be a specialty. A public garage will be maintained. A. E. Eckstein is general manager of the company.

Middleday, Philadelphia.—Middleday cars will be represented in Philadelphia by William P. David, formerly connected with the Kelsey Motor Car Company. Salesrooms have been arranged for on North Broad street, next to the West-Stillman Company.

Moline, Illinois.—Otto C. Owen, a brother of R. M. Owen, has taken the agency for the Moline cars for the State of Illinois outside of Chicago and vicinity. Mr. Owen will continue to act as the State representative of the Reo cars.

Overland, New York City.—The New York agency of the Overland Automobile Company has moved its quarters to 1657 Broadway. A Brooklyn salesroom will be ready for occupancy in a few days at 315 Livingston street.

Pope-Hartford, Waterbury.—A newly organized concern incorporated at $50,000, by C. S. Woodward, I. F. Backelder and H. F. Stackman, has taken the agency for the Pope-Hartford cars in Waterbury, Conn.

Stearns, Milwaukee.—The Wisconsin Automobile Company has been appointed agent for the Stearns car in Milwaukee. This company is erecting a two-story garage, 50 by 100 feet, on Wisconsin street.

Franklin, Hartford, Conn.—The new Franklin garage, conducted by Robert R. Ashwell at 341 Trumbull street, was formally opened last week, adding to Hartford's garages one of the largest in the city.

American, Los Angeles, Cal.—The American agency has been taken for Los Angeles by the American Motor Car Company, which has opened headquarters at Washington and Main streets.

Ke-Pa-Go-In Tires, Cleveland.—The Cleveland agency for the Ke-Pa-Go-In tires has been taken by the newly organized Zenith Motor Goods Company, of 2062 Euclid avenue.

Oakland, Hutchinson, Kan.—The Salt City Motor Company has opened a garage and salesrooms in Hutchinson, Kan., and taken the agency for the Oakland car.

Thomas Shock Absorbers, Philadelphia.—The Penn Square Automobile Company will be the Philadelphia agents for the Thomas shock absorbers.

Knox, Providence.—The Knox Automobile Company will be represented in Rhode Island by the Hitchcock-Banks Motor Car, 179 Aborn street, Providence.

Pittsburg "Six," Boston.—Stanley Webster has been made New England distributer for the Pittsburg "Six," his location being 1024 Boylston street, Boston.

Lane Steamer, Boston.—The Boston agency for the Lane steamer has been taken by the Cushman Motor Company, of 91 Church street.

Mitchell, Eastern Pa.—The Penn Motor Car Company, of Philadelphia, now represent the Mitchell car throughout Eastern Pennsylvania.

Cadillac, Cleveland.—The Barger Auto Company, Cleveland, agents for the Cadillac, has just taken possession of its new salesroom.

Thomas, Southern California.—R. C. Brassy, of Los Angeles, has been appointed agent for the Thomas cars in Southern California.

Pullman, Pittsburg.—The Auto Brokers' Exchange has been appointed the Pittsburg representative for the Pullman cars.

Franklin, Milwaukee.—The Milwaukee agency for the Franklin cars has been taken by Wm. F. Sanger.

PERSONAL TRADE MENTION.

P. J. Holm, formerly superintendent of the Northwestern Steel & Iron Works Company, of Eau Claire, Wis., has resigned and will go into the automobile motor and gasoline engine manufacturing field. Mr. Holm has organized the Holm Machinery Manufacturing Company, incorporated under the laws of Michigan, capital stock $100,000, and will build a large factory at Sparta, Mich. The plant will consist of a foundry, 200 x 200; machine shop, same dimensions; shipping house, pattern shop and storage building, 50 x 100 feet, with a testing shop of the same dimensions. Before going into the project, Mr. Holm secured contracts from automobile manufacturers for engines that will keep the plant busy for some time.

Theodore Deetjen, secretary and treasurer of the Wisconsin Automobile Exchange, 239-241 Wisconsin street, Milwaukee, and an assistant are making a tour of twenty-five of the largest cities of Wisconsin in Stearns and Midland demonstrators. The route will take them into every section of Wisconsin. This is the first time any Wisconsin agent has gone after business in this way, and the result of the personal tour is being watched with interest.

Monte Cross, shortstop for the Philadelphia Athletics in their championship days, and last year manager of the Kansas City American Association club, is putting in the winter in the shop of the Philadelphia branch of the Winton Motor Carriage Company, at 246 North Broad street. Monte expects to go into the automobile business for himself in the near future.

F. T. Sanford, who has been connected with the Napier Motor Company, of England, and well known to the automobile trade of New York, has opened a garage on Forty-third street, just off Fifth avenue, where he has the agency for the Thames six-cylinder cars.

Charles S. Hensbaw, of Boston, started from New York November 23 in a 1909 Haynes car on a 10,000-mile trip, which will include all the principal cities of New England. He will be accompanied by Loring Wagner, of Chicago.

E. J. Wall, for many years traffic manager of the Pope Manufacturing Company in Hartford, Conn., has gone with the New England branch of the Thomas B. Jeffery & Company, in Boston, in the capacity of business manager.

Dave Henry, formerly traveling salesman for the E-M-F Company, has accepted the position of sales manager for the Interstate Motor Car Company, of Chicago.

Charles P. Saunders, well known in the tire business in New York and Philadelphia, has joined the selling forces of the Firestone's Company's branch in Philadelphia.

Morgan R. Davis has been appointed general manager of the Penn Motor Car Company, of Philadelphia, agents for the Mitchell car in Eastern Pennsylvania.

Louis Elmer, the Ford agent at Hartford, Conn., is slowly recovering from his severe attack of pneumonia at the Hartford hospital.

J. D. Porter, who has been on the road for the E-M-F Company, has gone with the Cleveland branch of the Studebaker.

Quitting Time at the Factory of the H. H. Franklin M[illegible]

At the factory of the Franklin, Syracuse, N. Y., 6,000 automobiles [illegible] of the original thirteen Franklin cars, made in 1902, eight are known t[illegible] The Franklin factory has a floor space of 257,735 square feet. There [illegible] made, and 1,550 men are employed.

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THE AUTOMOBILE

Italy Scores over Germany In Savannah's Grand Prize With France Third and America Last

SAVANNAH'S Grand Prize is history. Italy took the honors. Germany was the runner-up. France again lost, for the third time this year under international rules. America—well, she completed the list of twenty entrants. Wagner, the '06 Vanderbilt Cup winner, was the bright and particular star, he driving a Fiat. Hemery, the '05 Vanderbilt king, made the battle fast and furious with a sturdy Benz from Germany. Nazzaro, however, was the man who seemed to have the Thanksgiving Day turkey well in hand, when, alas and alack, a "blow-out" and a too hurried replacement relegated his Fiat to third place. This serious and sad-eyed, yet most capable racing pilot from Turin, had intended if successful to make his appearance at Savannah the last in his notably remarkable career. There's a girl in the case, of course, and she is to be Mrs. Nazzaro. Whether there will be a special dispensation for another race will have to be answered in Italy. Nazzaro is likely to ask for one more race.

Such a race as Savannah had has never been equaled in some particulars. The city and the county in which it is located worked with might and main, and the results were only such as are always obtainable when conscientious men devote themselves to their task. Tiedeman, and Battey, and Granger and a score of others figure in the list of honor, which might be extended to include all the inhabitants, for certainly the South laid itself out to do the proper thing and it did it genuinely and without hesitation. While it was accomplished in the name of the Savannah Automobile Club, the credit goes far beyond its membership.

It was up to the Automobile Club of America to supply a first-class "show," and this fell to Morrell and his contest com-

Nazzaro During One of His Greatest Straightaway Flights.

mittee associates. Circumstances may have helped, but the fact remains that fourteen of the world's best drivers, supplied with superb racing crafts, came from Europe for the "Grand Prix" on American soil. To this contingent were added six American starters, who recognized the handicaps against them and sought experience and did not delude themselves with the idea of winning the A. C. A. cup. To enter into a game at which you are a novice and your opponent is an expert, isn't the best kind of judgment. 'Tis possible that nothing of the kind may happen again.

Expected Catastrophies Didn't Happen.

Before the race it was in the minds of many that the somewhat tortuous course might cause catastrophies innumerable, especially in view of the fact that the promoting clubs and the tire companies had been quite generous in prize money, and thereby the drivers might be tempted to take chances which otherwise would be passed unheeded. But the course gave evidence of the conscientious efforts of Engineer Hull, the turns being well banked, the oiling abundant—a bit too much—and the drivers negotiated the corkscrew curves rapidly and skilfully and none came to grief. In fact, the only accident was caused by the tread of a non-skid tire coming off and striking Erle in the face, thereby causing him temporarily to lose control of his juggernaut and smash into a tree alongside the road. His injuries may be comparatively slight. This was the sum total of the accident column. One mathematician figured over thirty turns, which, multiplied by sixteen, meant considerable of a strain on the drivers. The real contenders, however, were hardened to the trying and circuitous journey, and, as an example, it is said that Hemery made over 50 trial trips, becoming as familiar with the route as possible. This driver is a regular track horse for work.

Wagner Took the Turn Skilfully and Fearlessly.

For the light car race of the day before Thanksgiving, a short 10-mile quadrilateral circuit was utilized, but it was in this contest that the most serious accident happened, caused by the overturning of one of the participating voiturettes.

Excellent Guarding of the Course.

In the guarding of the course Major W. B. Stevens did the work completely with a comparatively small number of soldiers, though the crowds gathered at various points were smaller and less obstreperous than the hordes which invaded Long Island on the day of the Vanderbilt race. 'Tis possible that the Southrons are more law-abiding, but it is also a certainty that the guarding was more capably attended to than that contributed by the so-called Irish Brigade at the Vanderbilt contest.

A conservative estimate would place the number of onlookers inside the 100,000 mark, figuring that fully twice as many saw the Vanderbilt race. The prices charged were not such as can be obtained in the vicinity of New York, for one could buy seats at $3 for the two days in the most favorably located stand. The other place of vantage was for those people who came from Southern points and whose railroad tickets included a $1 place of observation. Some 20,000 must have been massed around the finish. It should not be thought, however, that the interest in the Savannah race was confined to the people who saw it. Generous stories were taken by all the daily papers, and invariably it had a front-page location. In New York City the A. C. A. provided for its members and their friends a score board and direct reports from the course, and these were read to a large crowd which filled the assembly room of the clubhouse on West Fifty-fourth street.

Light Race a Good Introductory.

The light car struggle supplied a most interesting introductory to the two days of excellent motor sport, and while the verdict went to the consistent running Lancia, made by the famous Italian driver of the same name, and guided by the cool-headed Hilliard, the American contenders were ever apparent and dangerous. Burman's Buick showed wonderful flights of speed, but apparently did not possess the ruggedness of the Italian product, though the well-calculated driving of Hilliard may have been a deciding factor. A mighty good clip was the 52.59 miles an hour of the little Lancia, though the statistics give the fastest lap to the No. 10 Chalmers-Detroit, which went the route at 57.63 m.p.h. Next was Burman's Buick at 55.98 m.p.h., and the Lancia at 54.93 m.p.h. The other little chaps had some fast flights.

In the big race the greatest speed attained, according to Trego's special timing instrument, was the 101.1 miles per hour of the Renault, driven by Strang. The companion Renault, handled by Szisz, was luckless, or otherwise the '06 Grand Prix hero might have been in the forefront of the fight.

The average of the race was even better than that of the Vanderbilt, wherein Robertson's figures were 64.3 miles per hour. The Grand Prize winner traveled at the rate of 65.08 miles per hour, even with the twisting and turning road. It was hardly anticipated that Nazzaro's Florio Cup average of 74.3 miles per hour would be touched, though the city of Savannah offered a special prize of $2,500 for the man-machine combination which might accomplish it.

Protests That Were Not Insisted Upon.

Herr Carl Neumaier, president of the Benz firm, on Saturday withdrew the protest he had filed Friday against the award of third place to Nazzaro, which, if allowed, would have given Hanriot, a Benz driver, third money. The protest was based on the Fiat crack having received outside assistance in changing tires on the last round. Nazzaro's defense was that some well meaning soldiers had insisted in helping him, and that being unacquainted with English he was unable to make it clear to them that their assistance endangered disqualification for him. There was some talk after the race of a protest being lodged against Hanriot for obtaining from a touring car gasoline which alone enabled him to complete his final round; but nothing came of it.

Telling How the Battle Waged in the Big Race

By John C. Wetmore

The Big Crowd that Filled the Grand Stand—The Supply Pits Occupied the Foreground.

SAVANNAH, Nov. 26.—Fog again threatened a long postponement of the Grand Prize, just as it had the day before in the light car race. As it was, when the cars were lined up at 8:30 o'clock, the mist so thickly clouded the course that one could not see a hundred yards up the road. At the appointed hour of 9 o'clock conditions were just as bad. Half an hour later there was some improvement, but then prudence forbade sending the drivers away into the mist clouds. A quarter of an hour later Starter Wagner sent Rigal away. By the time the field of 20 was under way, however, the sun had triumphed and a bright, balmy day was at hand.

The Start.—All of the twenty entrants faced the starter, who sent them away at minute intervals in the following order: Rigal, Clement; Mulford, Lozier; Seymour, Simplex; Burman, Buick; Haupt, Chadwick; Nazzaro, Fiat; Zengle, Acme; Hemery, Benz; Duray, DeDietrich; Szisz, Renault; Harding, National; Cagno, Itala; Hautvast, Clement; Wagner, Fiat; Hanriot, Benz; Strange, Renault; Fournier, Itala; DePalma, Fiat; Erle, Benz, and Piacenza, Itala. The Americans had the best positions in line, four of them being in the first quintette, the other two starting seventh and eleventh, respectively.

First Lap.—With the field under way in 19½ minutes, the spectators had not long to wait for the head of the flying column to reach the grandstand. It was the Lozier, Mulford having gotten by Rigal. Then came Seymour, who had also passed the Clement crack. Haupt outfooted Burman and Hemery easily disposed of Zengle. All this time DePalma, the former bicycle rider, was coming like a whirlwind from the rear with the Fiat. When the racers had passed and the times were matched up DePalma was the leader, 12 seconds ahead of Wagner, who had beaten Hautvast 6 seconds, the Clement driver in turn leading Hanriot by 2 seconds. Nazzaro and Hemery, the favorites, were content with conservative laps in 23:42 and 23:54, respectively. Szisz was pushing the Renault hard in 22:41, a 67-mile-an-hour clip.

Second Lap.—Willie Haupt flashed to the fore in the second lap with the Chadwick and got a royal welcome from the spectators, who were eager to hurrah for an American as long as they had a chance. DePalma continued to climb up the ladder hand over fist. Scoring 21:36, the fastest lap in the race, equalled only by his own in the seventh round and showing a 70-mile-an-hour gait, the Italian-American lad increased his lead over the field. He led Hanriot, who had been going some also, by 1 minute 19 seconds, a good mile and a half of margin. Wagner, Erle, Cagno, and Szisz were also hitting the pace. Nazzaro and Hemery were driving well within themselves at 65 1-2 and 61 1-2 miles an hour averages. It was a magnificent struggle for the lead of seven leaders traveling at faster than 63 miles an hour.

Third Lap.—Before the third round closed, the three Americans, Mulford, Seymour, and Haupt, had lost their leadership of the procession, and Nazzaro was making the pace. De Palma suffered a five-minute delay and dropped back from the leadership into the ruck. Hanriot and Szisz had fought their way to the front and were having a neck and neck struggle for the premiership, the Benz leading the Renault by but 7 seconds, with Erle in hot pursuit a half a mile further back. Two of the Americans, Burman and Zengle, were out of the race for good. Nazzaro and Hemery and Wagner, the ultimate trio of leaders, were back in the second division, which included Cagno and Strang.

Fourth Lap.—The fourth round saw Nazzaro, Hemery and Szisz leading the procession. They were only leaders, however, so far as the order of passing the stand went, for Hanriot still held the lead, the Benz having covered 100.52 miles in 89:44. Another Benz man, Fritz Erle, was in second place on 44 seconds behind his team mate. The German pair had opened close to a two-minute gap on Nazzaro, who was being hotly pursued by Hemery, a half a minute further to the rear. Haupt was making the best showing of the Americans, the Chadwick being still in the middle of the European bunch with as many behind him as ahead of him.

Fifth Lap.—Hanriot still hung stubbornly to his lead, but by a round in 22 minutes flat, a 68.5-mile gait. Wagner had dislodged Erle from second place. It was now becoming a race that for closeness will long live in automobile history. The leaders were only seconds apart, their order and times being: Hanriot, 1:14:10; Wagner, 1:14:14; Nazzaro, 1:14:44; Szisz, 1:14:46; Hemery, 1:15:02; Erle, 1:15:12, for 125.65 miles. This was probably the most closely contested round of the race.

Sixth Lap.—Nazzaro and Hemery were now driving their cars for all they were worth in an effort to overtake the flying Hanriot. They managed to outpace Szisz, Wagner, and Erle, but Hanriot for the time being was too much for them, for the Benz showed a round in 21:52, which landed it 34 seconds ahead of Hemery and 1 minute 8 seconds to the better of Nazzaro. Wagner was their pursuer.

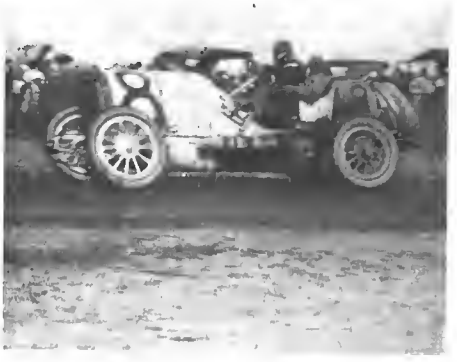
Seventh Lap.—Hanriot slowed down a bit in this round, but not enough, however, to cost him his lead. Nazzaro and Hemery were having a fine duel between themselves, the Frenchman leading the Italian by but 14 seconds. Both were hot foot after the runaway Benz. Wagner was hanging fire a bit, but DePalma had got his Fiat going again and was after the leaders in earnest with a lap in 21:36, which tied his record of the second lap. All this time the fat and prosperous veteran Fournier was not making a half bad showing with the Itala, plugging along pretty steadily at a 60-mile-an-hour gait. Seymour was driving

tbe best of the Americans, Haupt having thrown up the sponge for good during the preceding round.

Eighth Lap.—Before tbe halfway post had been passed, Wagner, Hemery, and Nazzaro, the ultimate leaders in the race, had fougbt their way into the three leading positions. At the end of the round, in fact, they occupied the positions named, which were the order of tbeir final finish. Wagner led Hemery 30 seconds, who had a margin of but 10 seconds over Nazzaro. The Fiat crack, following bis invariable custom, stopped at the half-way post to replenisb fuel. So did tbe Benz champion. Wagner, however, continued. Hanriot bad halted by the wayside and was now in fifth position, Hautvast having passed him. The other racers were now hardly in the running, so far as bopes of the first three places went. In the preceding round, by the way, Szisz had dropped out, having broken a bearing in the front axle of his Renault.

Ninth Lap.—The race had now practically narrowed down to a triangular duel among Wagner, Hemery and Nazzaro. Wagner lost his narrow lead this round by making his delayed stop for gasoline and oil. Entering the last half of the race, Hemery began to ride like a speed fiend possessed. Covering this lap in 22:22 he completed it with 39 seconds of precious margin to his credit. Wagner having fallen over a minute to the rear of Nazzaro, Hautvast, Hanriot, DePalma, and Erle were also spurting hard, but they were too far behind for their spring to be of much avail.

Tenth Lap.—The three-cornered fight for the lead kept the spectators "on their toes" all the time. They watched eagerly for the coming of the first of the trio and listened attentively for the figures as they were announced. Wagner got by Nazzaro, but was still 9 seconds behind Hemery.



Hemery, Who Looked a Sure Winner.

Eleventh Lap.—In the preceding lap, Wagner had made the 25:13 mile circuit in 22:11. He lowered this to 22:05 in tbis round, and by his sprint secured a lead of a minute over Hemery and 1 minute 19 seconds over Nazzaro. Cagno was put out of the race in this lap by a broken rear spring.

Twelfth Lap.—It was now up to Nazzaro to be up and doing something. He did it. A lap in 22:52 aided by a faltering of Wagner and Hemery gave him the lead, and a pretty good lead, too, considering how near the finish was. In fact, the score board was completely upset, Nazzaro leading Wagner by 2 minutes 39 seconds and Hemery by 2 minutes 44 seconds. It looked to be all over but the shouting for Nazzaro.

Thirteenth Lap.—Increasing his pace to a 23:38 lap, Nazzaro pulled still further away from Hemery. Wagner had slowed down to 24:45 and wound up the round 1 minute 5 seconds behind Hemery, who was 3 minutes 39 seconds behind Nazzaro. It looked to be more ever a cinch for the Italian.

Fourteenth Lap.—Hemery spurted gamely in this round, scoring 22:48 for tbe circuit and cutting down Nazzaro's lead to 2 minutes 27 seconds. Wagner went even faster, and at the finish of the lap had reduced the Benz's lead to 29 seconds by a round in 22:12, his fastest circuit so far.

Fifteenth Lap.—Nazzaro, having the race well in hand, slowed down a wee little bit. Wagner quickened his pace to 22:11, his fastest in the race, and Hemery raised his gait to 22:38. The two French pilots were making a magnificent effort to overtake the cool-headed Italian. To what a high pitch of excitement the closeness of the struggle had wrought up the spectators can easily be imagined. All hands were on their feet watching up the stretch for the appearance of the leader and straining their ears to catcb promptly tbe figures the timers gave out.

The Finish.—Nazzaro entered tbe final round witb a lead of 1 minute 52 seconds over Hemery, whose margin over Wagner's was but 2 seconds. Barring one of those bundred accidents that can befall an automobile racer, Nazzaro was the winner. Within 2 minutes after Hemery and Wagner had passed the stand, the megaphone man fired a bombshell into the crowd.

"Hemery has passed Nazzaro!" A telephone man had sent the message, but he gave no particulars. The crowd refused to believe its truth until the white Benz was seen coming down the stretch. Nazzaro was, indeed, beaten, but Nazzaro had not started until 6 minutes after Hemery, and the race was not over. Then came Nazzaro, the first of the trio to start. Then came at last, after what seemed hours of suspense to the waiting crowd, Wagner. There was a deatblike silence, and tben some one in the Fiat pit cheered. Then came the megaphoned time. Wagner had won. He had beaten Hemery by 56 seconds and Nazzaro by 2 minutes 27 seconds.

A puncture, in fact, two of them, had been the Italian's undoing. A tire was quickly replaced, but Nazzaro had gone but a short distance when he discovered that the tire he had just put on was soft and another change was necessary.

The finisb of Hanriot, who was fourth, was ludicrous. His Benz had run short of gasoline at tbe head of the slight decline forming the bome-stretch, and it literally coasted in. Its crew swayed their bodies and the crowd "rooted" to belp it along. It just managed to get across the tape.

At the conclusion of the race Wagner and Hemery were brought before the "royal box" in their cars and presented to tbe spectators, who cheered them heartily.

The first four finisbers were equipped with Michelin tires and divided among themselves $3,800 in prizes given by tbe Michelin Tire Company, made up of $2,000, first; $1,000, second; $500, third; and $300, fourth. Fifth and seventh places fell to cars fitted with Dunlops. Sixth, eighth, and ninth finishers were equipped with Michelins.

All nine of the cars that were timed for the entire 402.08 miles were fitted with Bosch high-tension magnetos, thus winning $500, first; $250, second, and $100 for third, offered by the Bosch Magneto Company.

Eigbt thousand dollars in cash was put up by the Automobile Club of America, which was won as follows: Wagner, Fiat, first, $4,000; Hemery, Benz, second, $2,000; Nazzaro, Fiat, third, $1,000; Hanriot, Benz, fourth, $750; Hautvast, Clement-Bayard, fifth, $250. The money will be handed over to the winners at the Automobile Club of America's clubhouse Wednesday.

With Governor-elect Brown as the chief guest of honor, it was evident that the State had lent itself in making the success one that encompassed Georgia.

In its comment upon the race, the Savannah *Press* editorially said: "From the very first the whole city entered into the movement with the finest possible civic spirit. No work was too hard, no concession in reason too great, to meet with an instant and favorable response. City and county authorities have pulled together as one man, and the military has responded promptly and gladly. Tens of thousands of dollars have been advanced by the various local interests, not for the purpose of taking a penny of profit directly, but by way of making Savannah known to the world as one of the very 'biggest,' most energetic, most virile cities of its size on the map. In this Savannah has succeeded."

Technical Consideration of the American Grand Prize

By David Beecroft.

NOTHING shows more conclusively the excellent workmanship in many of the high-grade racing cars than the fact that nine out of the twenty that started in the 402-mile Grand Prize race actually finished the course and three others were running in good shape when the referee declared the race off, making twelve out of twenty or 60 per cent. in commission after the gruelling experiences over the rough roads for almost seven hours. Of the eight that dropped out, one was due solely to an accident, namely No. 19 Benz, driven by Fritz Erle, which was overturned on the White Bluff road by the tire tread on the right rear wheel coming loose and striking Erle, who was knocked unconscious. This left but seven cars actually put out of the running because of troubles with the machines or the drivers. Two of these went out through broken springs, one through oiling troubles, one because of a broken camshaft, one a broken ball bearing, and two others because of troubles caused through running off the road.

That the foreign cars were in a class by themselves was evident from the completion of the second lap, when they began setting a pace all of their own, and running with the utmost regularity. The motors ran perfectly, the drivers not having to raise the hood throughout the entire race with several of the cars and having no other task than guiding them on the road, taking on gasoline and oil, and repairing tires. In the sixteen laps that each of the nine foreigners, to finish, flashed past the grandstand not a single instance of running on three cylinders occurred, and only one case of a motor in the symptoms of distress appeared. The cars were built for the task and trained to it. Before any of the cars contested in their first races this year they were given thousands of miles of touring work through Europe, when the drivers had a chance to learn every detail of them and when the cars had an excellent opportunity to get worn in.

The troubles with the American cars in most cases were due to lack of preparedness: either the cylinders were not properly worn in, the lubricating means had not been sufficiently tried out, or other parts duly tested. In connection with the American machines it must be remembered that three were stock machines with a few racing necessities added, and the others semi-racing cars which were but natural evolutions of stock machines and not out-and-out racing locomotives built expressly for the big road races of 1908. It is unusual in road races for cars to be eliminated because of broken springs, which, however, was due to the rough condition of parts of the course and some of the bad trolley crossings, two of which the cars had to cross.

Wagner with the winning Fiat had few other troubles than tires and stops for gasoline and oil. His motor sounded the best of the three Fiats, although he did not make as fast time as did DePalma. Wagner's motor had a very regular purr which was rhythmical to the extreme and an examination of the complete car at the end of the run failed to disclose any evidence of trouble to the running gear. In the twelfth lap when stopping at the grandstand pits to take on oil and a new tire the mechanician examined the jackshaft at the left end and used a bit of rope in tying up apparently some small part of the chassis which had nothing to do with the jackshaft. This was the only evidence of trouble the car had during the entire race.

Hemery's No. 8 Benz did not even give that much trouble, and the only stop made at the grandstand was in lap eight to take on gasoline and oil. Nazzaro with third honors had an equally clean record, his car running perfectly throughout the contest and tires only being the troublesome factors. Hanriot with No. 15 Benz in the first seven laps looked like a certain winner and was leading in time for several successive laps and the Trego timer reported him making the mile straightway at a speed of 100 miles per hour. But the pace broke the oil lead from the hand pump to the crankcase, and a delay of nine minutes in the eighth lap and seven minutes in the ninth frosted the fondest hopes of his admirers. Having to change two tires in one lap at this time was the expected result of the terrific pace he had set and still further separated him from the premier position. He further lost 2 minutes 31 seconds in the eighth lap when taking on gasoline and oil and ran out of gasoline at the end of the last lap, and his car was barely able to coast over the finishing line, which made his last lap about 3 minutes slower than his average.

Hautvast, in No. 13 Clement, drove a remarkably consistent race and had the Clement machine working at its limit most of the time. He made but two stops in front of the grandstand pits, one in the ninth lap when two minutes were consumed in changing a couple of rear tires and in taking on of supplies. Again in the last lap he stopped for 25 seconds. Lewis Strang, the winner of first honors on the same course last March in the stock chassis race, was in hard luck with his Renault machine, and although he made the fastest miles on the homestretch, running as high as 101.7 miles per hour, he never averaged high on his laps. He was over 25 minutes on the first lap and came past the grandstand with the bonnet off and completed the race without it. On the third lap he lost three minutes at the grandstand pits in changing a left rear tire; at the start of the seventh lap he lost nearly 15 minutes with tires and engine troubles.

Rigal in No. 1 Clement started off with bad luck in the first lap, when he was compelled to put on a second magneto, the first one going out of commission and costing him seven minutes at the start of the race. On the eighth lap he changed the two rear Dunlop tires and took on gasoline and oil, the three operations being completed in 3 minutes and 15 seconds, and the one man doing the tire changes in the minute. Rigal's car was not so fast as the Fiat or Benz but its regularity of running was such as to bring forth cheers from the grandstand as soon as it realized what the machine was doing.

After Rigal in the honor roll came Henry Fournier with his shaft-driven Itala, the only one of the three cars of this make to be running at the end of the race. For the first eight laps he drove consistently, doing all of them in 24 minutes and a few

seconds; but after this bis pace was slower. Laps 9 and 10 were slow, due to tire changes and taking on fuel, and the last six laps averaged more than a minute slower than the pace he set in the first half of the race. Cagno, driver of No. 12 Itala, withdrew at the end of the tenth lap because of breaking the long leaf in the left rear spring where it turned around the shackle bolt. The four springs on this car were completely taped, as were the shackle links and bolts, and it required the cutting off of this taping before the exact nature of the break could be discovered. When the trouble was detected the car was driven off the course at the end of the pits, where it remained until the completion of the race. Piacenza driving the third Itala No. 20 went off the road on the Isle of Hope turn and withdrew from the race and it was impossible to discover the exact cause.

Duray, driving No. 9 De Dietrich, met with misfortune in lap five, when the radius rod on the right side broke, allowing the jackshaft sprocket to pull back toward the rear wheel, after which the driving chain broke and cut Duray severely on the right arm above the elbow. He drove to the grandstand, where the wound was dressed, after which the broken parts of the car were repaired, 21 minutes 15 seconds being needed, and which

Strang's Renault Reached the Highest Recorded Speed.

was enough to put him out of the race. Later in the tenth lap three minutes were lost in taking on gasoline and changing a rear tire, and again in the twelfth 1 minute 48 seconds were needed in wrapping the injured arm. He had completed fourteen laps when the race was called off.

De Palma in No. 18 Fiat was picked by many as the possible winner of the race, and the way he reeled laps off at the start did much to convince others tbat the confidence many had placed in him was well placed. He did four laps in less than 22 minutes to the lap and there was only one lap made by any of the other drivers under the 22-minute mark, and that was by Hanriot's No. 15 Benz, which set the sixth lap at 21:52, whereas De Palma placed the mark at 21:36 in the second lap and duplicated it in the seventh and made a couple of other laps in 21:48 and 21:55. But the pace worked havoc with his oiling and tires and in the third lap his car actually roze for a time because of not having fed enough oil to the cylinders. He required 47:54 for the lap during which time he was lapped by nearly all of the others and lost every hope of getting within the first five. To add to this loss of time was 4 minutes 15 seconds in lap five, when he changed a tire and took on gasoline. In the sixth lap 7 minutes 30 seconds were lost in oiling the motor and overcoming the difficulties caused by lubrication. In the ninth lap 5 minutes were lost in taking on gasoline, oil and water. In the twelfth lap 1 minute 5 seconds were needed to take off an old tire from the car and hang a new one on; and in the fourteenth another 2-minute stop was needed for taking on more oil. It may frankly be stated that De Palma's entire troubles were due to the terrific pace he set and not increasing the oil feed in proportion to it. To add to these difficulties he had troubles galore. At the finish of the fifth lap when changing a right front tire the big jack slipped letting the rim of the wbeel down on the ground and making the car axle too low to get tbe large lever jack under and making it necessary to use a small screw jack to raise that side of the car enough to get tbe lever jack in position. Again at the end of the sixth lap when changing tires he changed the left front and right rear and put a couple of new ones on the back of his car. He then decided to change the left rear and in doing this the first demountable rim with tire he tried was too tight and after kicking for some time to get it on bad to roll it back to the pit. The second one be tried was no better and after wasting time be called for a third one which slipped on easily.

Something Concerning the American Cars.

Of the six American cars contesting not one finished the sixteen laps, but two were running at the finish, the Lozier and the Simplex. The Simplex suffered because of new eylinders which had not been worked down to the smooth finish necessary. The car handled by Seymour made good time in the first three laps, but at the end of the fourth had to stop at the pits for water and oil, losing exactly 5 minutes. A new tire was taken on at the same time. In the eigbth lap another stop of 4:30 seconds duration was made during which two old tires were thrown off the tire rack on the car and three new ones placed on it; this done gasoline, oil and water were taken on. Again in the tenth lap a 5-minute stop was made at the pits when a new tire was taken on and gasoline, oil and water replenished. None of Seymour's laps were made in less than 23 minutes, and the car, barring its motor troubles, as already stated, had no trouble whatever, but the frequent stops for tire changes. He was in the fifteenth lap when the race was called off and running fast.

The Lozier was the first car to stop in front of the grandstand, halting for one minute at the end of the second lap to take on water and put on a new rear tire. On the tbird lap another stop was made, and again in the eighth. The car plainly sbowed the results of not being ready for the fray, and like the Simplex had it had 2 or 3 weeks workout there would be a different story.

The six-cylinder Chadwick, driven by Haupt, after making the first two laps in a few seconds above the 23-minute mark, stopped at the end of the third lap and worked some time on the emergency brake lever. The third lap was two minutes slower than the previous two, and the fourth still slower. During the fifth a telephone message announced that the car bad quit the race due to the hand oil pump becoming disabled, which resulted in the reported burning out of one of the motor bearings, presumably a connecting rod one. General regreat was expressed on every hand that Haupt should have troubles of the same nature as De Palma, which were not in any sense due to faulty construction but rather to feeding too little oil.

The Acme six, driven by Zengle, in its first two laps gave promise of finishing the course and about a 26-minute per lap pace, but in the third lap broke the right front spring and was over 2 hours making the circuit. When it appeared at the grandstand the frame at that point was supported on a block of wood that was ropped and strapped in position. With this handicap the car made four more laps close to the 27-minute mark, but finally dropped out a couple of hours before the finish of the contest, the pace being too fast on such spring suspension.

Harding in the six-cylinder stock National car got into difficulties on the first lap when some waste got into the gasoline line requiring over 55 minutes to make the lap and remove the impediment. After this the car had a little carbureter trouble, but was running with good regularity, and during the eighth, ninth, tenth, and eleventh laps was running a neck-and-neck race with Seymour in the Simplex and caused the grandstand to begin computing on which of them would be the leader in the American car class. In the eighth the Simplex led by less than a minute. In the ninth it had increased this to 69 seconds. In the tenth it dropped to 56 seconds, but by the end of the eleventh it was increased to over 3 minutes. At this point the National stopped in front of the grandstand and pulled off the course, where it remained until the completion of the race, the apparent trouble being the disabling in some manner of the camshaft of the motor.

RACE FOR THE GRAND PRIZE OF THE AUTOMOBILE CLUB OF AMERICA, SAVANNAH, GA., NOVEMBER 26, 1908.

No.	CAR	Driver	25.13 Miles 1st	50.26 Miles 2d	75.39 Miles 3d	100.52 Miles 4th	125.65 Miles 5th	150.78 Miles 6th	175.91 Miles 7th	201.04 Miles 8th	226.17 Miles 9th	251.30 Miles 10th	276.43 Miles 11th	301.56 Miles 12th	326.69 Miles 13th	351.82 Miles 14th	376.95 Miles 15th	402.08 Miles 16th	Total Time	Average miles per hour
14	FIAT	Wagner	22:30	45:03	69:46	92:14	114:14	138:50	163:07	184:57	208:47	230:58	253:03	279:31	304:16	326:28	348:39	370:31	6:10:31	65.08
			22:30	22:33	24:43	22:28	22:00	24:36	24:17	21:50	23:50	22:11	22:05	26:28	24:45	22:12	22:11	21:52		
8	BENZ	Hemery	23:54	48:24	70:27	92:39	115:02	137:26	160:20	185:27	207:59	230:49	254:03	279:58	303:11	325:57	348:37	371:27	6:11:27	64.94
			23:54	24:30	22:03	22:12	22:23	22:24	22:54	25:07	22:32	22:50	23:16	25:55	23:13	22:46	22:40	22:50		
6	FIAT	Nazzaro	23:42	46:45	69:30	92:01	114:44	137:40	160:46	185:37	208:38	231:32	254:22	277:14	299:52	323:32	346:45	378:47	6:18:47	63:64
			23:42	23:03	22:45	22:31	22:43	22:56	23:06	24:51	23:01	22:54	22:40	22:52	22:38	23:40	23:13	32:02		
15	BENZ	Hanriot	22:38	45:13	67:26	89:44	114:10	136:02	158:38	189:57	219:27	241:47	265:09	288:53	312:44	336:39	360:43	386:12	6:26:12	62.42
			22:38	22:35	22:13	22:18	24:26	21:52	22:36	31:19	29:30	22:20	23:22	23:44	23:51	23:55	24:24	25:29		
13	CLEMENT-B'D	Hautvast	24:36	48:41	73:06	99:17	123:24	147:31	171:23	175:19	221:11	244:10	268:49	293:00	318:08	343:30	369:13	394:06	6:34:06	61.20
			24:36	22:05	24:25	26:11	24:07	24:07	23:52	23:48	25:52	22:59	24:39	24:11	25:08	25:22	25:43	24:53		
16	RENAULT	Strang	25:13	47:33	70:29	96:23	119:10	141:55	165:30	204:52	227:52	258:18	282:03	306:08	330:03	356:47	378:58	403:37	6:43:37	59.76
			25:13	22:20	22:56	25:54	22:47	22:45	23:35	39:22	22:40	30:36	23:45	24:05	23:55	26:45	22:11	24:39		
1	CLEMENT-B'D	Rigal	32:23	57:00	81:52	106:46	130:51	154:48	178:31	202:52	230:16	254:45	280:52	304:16	329:11	354:13	380:16	405:43	6:45:43	59.40
			32:23	24:37	24:52	24:54	24:05	23:57	23:43	24:21	27:14	23:29	26:07	23:24	24:55	25:02	26:03	25:27		
17	ITALA	Fournier	24:30	48:45	73:40	98:37	123:41	148:38	173:21	197:38	225:23	252:53	277:59	303:57	329:51	355:23	381:20	406:32	6:46:32	59.32
			24:30	24:15	24:55	23:57	25:04	25:57	24:43	24:17	27:45	27:30	25:06	25:58	25:54	25:22	25:57	25:12		
18	FIAT	DePalma	22:18	43:54	91:48	113:36	40:14	169:33	191:09	213:04	243:54	266:31	289:05	315:28	338:30	363:43	388:59	411:34	6:51:34	58.60
			22:18	21:36	47:54	21:48	26:38	29:19	21:36	21:55	30:50	22:36	22:34	26:23	23:02	25:13	25:16	22:35		
9	DE DIETRICH	Duray	24:05	47:48	75:07	105:38	134:07	179:55	203:07	226:22	249:29	294:16	322:41	353:41	379:47	405:33	Running at finish of race.			
			24:05	23:43	27:19	30:31	28:29	45:48	23:12	23:15	23:07	44:47	28:25	31:08	25:58	25:46				
3	SIMPLEX	Seymour	24:25	48:23	72:06	108:59	139:26	169:06	193:56	251:50	278:14	317:14	343:48	376:26	401:02	426:25	Running at finisb of race.			
			24:25	23:58	23:43	36:53	30:27	29:40	26:50	57:54	26:24	39:00	26:29	32:43	34:36	25:23				
11	NATIONAL	Harding	55:01	80:46	107:25	136:40	163:28	198:21	225:32	252:34	279:23	318:10	345:49	Out; broke camshaft.						
			55:01	25:45	26:39	29:15	26:48	34:53	27:11	27:02	26:51	38:47	28:39							
19	BENZ	Erle	23:12	45:40	68:12	90:28	115:12	140:36	164:00	186:11	210:07	232:33	Out; driver hit by tread of tire and car went off road at White Bluff.							
			23:12	22:28	22:32	22:26	24:44	25:24	23:24	22:11	24:56	22:26								
12	ITALA	Cagno	24:11	46:40	69:25	95:21	121:08	144:20	167:27	190:49	217:11	260:03	Out; broken rear spring.							
			24:11	22:29	22:45	25:56	25:47	23:12	23:07	23:22	26:22	42:52								
2	LOZIER	Mulford	25:11	63:07	101:03	128:45	171:52	310:23	337:43	366:53	394:02	429:11	Out; running at finish of race.							
			25:11	36:56	37:56	27:42	43:07	38:29	27:20	29:10	27:09	34:69								
10	RENAULT	Szisz	22:41	45:16	67:33	92:24	114:46	141:12	Out; ball broke in bearing of front wheel.											
			22:41	22:35	22:17	24:49	22:22	26:26												
7	ACME	Zengle	27:22	54:04	181:31	208:53	236:45	263:52	Broke right front spring in 3d lap, but finally got going again.											
			27:22	26:42	127:27	27:22	27:52	27:07												
20	ITALA	Piacenza	24:41	51:31	74:48	98:07	125:48	Out; off the road at Isle of Hope.												
			24:41	26:50	23:17	23:19	27:41													
5	CHADWICK	Haupt	23:51	47:17	72:23	99:52	Out. Burned out connecting-rod bearing.													
			23:51	23:26	25:06	27:29														
4	BUICK	Burman	31:44	59:56	Out; broke down at County Farm.															
			31:44	28:12																

HOW THE LEAD SHIFTED DURING THE RACE.

No.	CAR	Driver	1st	2d	3d	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th
14	FIAT	Wagner	2	2	6	4	2	4	4	1	3	2	1	2	3	3	3	1
8	BENZ	Hemery	8	12	7	6	5	2	2	1	1	1	2	2	2	2	2	2
6	FIAT	Nazzaro	6	7	5	3	3	3	3	3	2	3	3	1	1	1	1	3
15	BENZ	Hanriot	3	3	1	1	1	1	1	5	6	5	4	4	4	4	4	4
13	CLEMENT-B'D	Hautvast	13	13	11	11	9	9	8	7	7	6	5	5	5	5	5	5
16	RENAULT	Strang	16	9	8	8	7	7	6	9	9	9	8	8	8	8	6	6
1	CLEMENT-B'D	Rigal	19	17	15	14	12	11	10	10	10	8	7	7	6	6	6	7
17	ITALA	Fournier	12	14	12	10	10	10	9	8	8	7	6	6	7	7	8	8
18	FIAT	DePalma	1	1	16	13	15	13	11	11	11	11	9	9	9	9	9	9
9	DE DIETRICH	Duray	9	10	14	13	13	14	13	12	12	12	10	10	10	10		
3	SIMPLEX	Seymour	11	11	9	15	14	12	12	13	13	13	11	11	11	11		
11	NATIONAL	Harding	20	20	18	18	16	15	15	14	14	14	12					
19	BENZ	Erle	5	5	3	2	6	5	5	4	4	4						
12	ITALA	Cagno	10	6	4	7	8	8	7	6	5	10						
2	LOZIER	Mulford	15	19	17	17	17	17	14	15	15	15						
10	RENAULT	Szisz	4	4	2	5	4	6										
7	ACME	Zengle	17	16	19	19	18	16										
20	ITALA	Piacenza	14	15	13	9	11											
5	CHADWICK	Haupt	7	8	10	12												
4	BUICK	Burman	18	18														

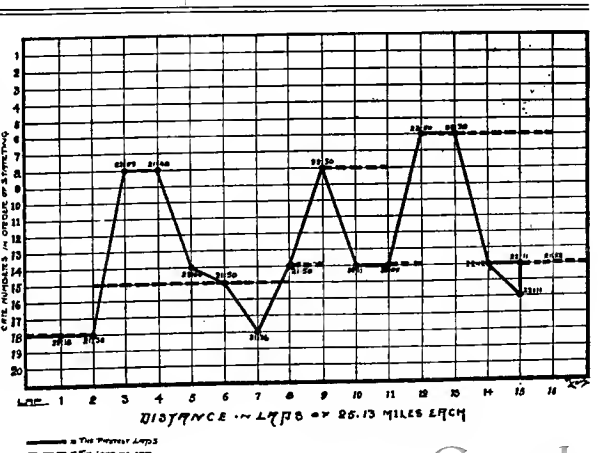
FASTEST LAP OF EACH DRIVER.

No.	CAR	Driver	Fastest Lap	Lap	Miles per Hour
14	FIAT	Wagner	21:50	8	69.16
8	BENZ	Hemery	22:03	3	68.36
6	FIAT	Nazzaro	22:31	4	66.96
15	BENZ	Hanriot	21:52	6	69.15
13	CLEMENT-B'D	Hautvast	22:05	2	68.25
16	RENAULT	Strang	22:11	15	67.96
1	CLEMENT-B'D	Rigal	23:24	12	64.40
17	ITALA	Fournier	23:57	4	62.92
18	FIAT	DePalma	21:36	2 & 7	69.80
9	DE DIETRICH	Duray	23:07	9	65.19
3	SIMPLEX	Seymour	23:43	3	63.60
11	NATIONAL	Harding	25:45	2	58.53
19	BENZ	Erle	22:11	8	67.96
12	ITALA	Cagno	22:29	2	67.07
2	LOZIER	Mulford	25:11	1	59.86
10	RENAULT	Szisz	22:17	3	67.56
7	ACME	Zengle	27:22	1 & 4	55.08
20	ITALA	Piacenza	23:17	3	64.14
5	CHADWICK	Haupt	23:26	2	64.30
4	BUICK	Burman	28:12	2	53.42

BEST SPEEDS FOR A FLYING MILE.

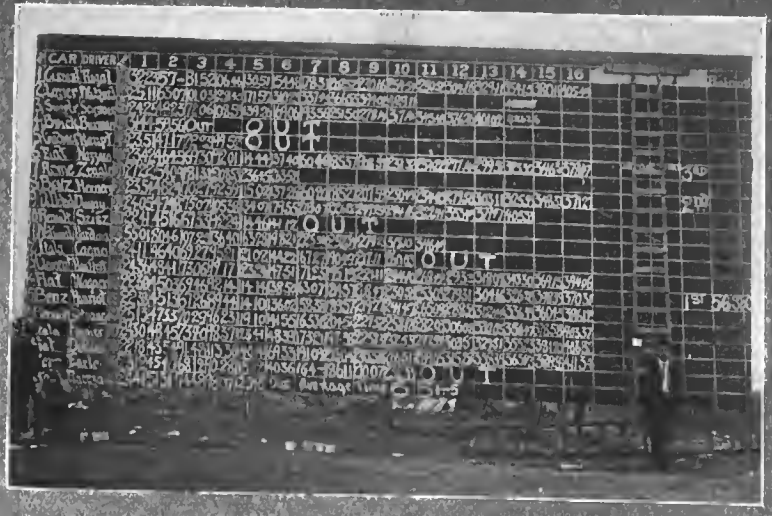
Obtained by Frank H. Trego's Electro-Magnetic Timer on a Measured Part of the Course

No.	CARS	Drivers	M.P.H.
16	RENAULT	Strang	101.1
15	BENZ	Hanriot	100.0
20	ITALA	Piacenza	99.8
10	RENAULT	Szisz	99.2
18	FIAT	DePalma	94.7
19	BENZ	Erle	94.7
8	BENZ	Hemery	94.2
13	CLEMENT	Hautvast	93.2
17	ITALA	Fournier	91.8
12	ITALA	Cagno	91.8
1	CLEMENT	Rigal	90.4
14	FIAT	Wagner	90.0
9	DE DIETRICH	Duray	87.7
6	FIAT	Nazzaro	86.9
3	SIMPLEX	Seymour	82.9
2	LOZIER	Mulford	80.7
5	CHADWICK	Haupt	78.2
11	NATIONAL	Harding	74.0
7	ACME	Zengle	72.2
4	BUICK	Burman	



ERLE'S LUCKLESS BENZ A LA TURTLE

DELEGATE COLTELETTI CONGRATULATES E. R. HOLLANDER-REFEREE MORRILL SUPERVISING



WINNING WAGNER AND HELPER HAPPY

CITY OF SAVANNAH ARRIVING WITH A. C. A. PARTY

ALONG THE REPLENISHING LINE

Some Impressions of a Former Grand Prix Manager

By Victor Breyer

WHILE in Savannah and since I returned to New York, the same question has been put to me, not once, hut I should say a hundred times: "What do you tbink of the big race?" It occurred to tbe editor that it might interest some readers of THE AUTOMOBILE to know what my impressions were down there. Not that my humhle person is of much importance by itself, but merely because I was one of tbe very few French visitors in Savannab, and also on account of my close connection with last year's Grand Prix of the Automobile Club de France. Many people on this side not being aware of the fact, perhaps I may he allowed to mention that I was in charge of the general management of this event, whicb took place on the Circuit de Dieppe, and, by the bye, resulted in a brilliant win for Nazzaro. It was a new move on the part of the French club to nominate a special man to superintend the work, with results that for the first time in the history of automobile racing on our side the 1907 Grand Prix showed a profit, and a handsome one, too.

To revert to the race under notice, it is also a curious fact to record that outside of tbe competitors, I must have been tbe only person to witness all three of the hig speed races held this year, the first in date being the French Grand Prix, which was again held in Dieppe and won by Lautenschlager on a Mercedes; the second being the Florio Cup, which took place near Bologna, Italy, and saw Nazzaro again a winner; and the third, this last Savannah event. It may seem strange to many that I fail to mention the Vanderbilt Cup race in this enumeration, but it would hardly appear a really international affair to eyes that are European.

Having therefore witnessed the ahove trio of hig 1908 races, I am exceedingly pleased to say right here that the first American Grand Prize favorably compared with the other two, both in regard to sporting interest and management. In fact, I doubt if there ever was a better conducted affair, and will confess that I have not seen or heard of any. Of course, as will always be the case witb such a buge undertaking as the organization of a long distance motor speed contest on the road, some minor points may have heen defective, but I want to say tbat they were few and far between—fewer, in fact, to my mind than was the case in either Dieppe or Bologna.

On the race itself, nobody expects me to dwell at any length, since this bas been done tboroughly by men more able than myself. While the field of competitors could not be compared to the 48 starters in the French race, when outside of last Thursday's lot such makes as Mercedes (winner), Panhard, Brasier and Opel also came to the post, its standard was distinctly higber than the field for the Florio Cup event, out of which not only the above makers, but also the Benz and Renault stayed. It looked "classy" enough and well deserves to rank as the second biggest race of the year, as far as sporting interest goes, wbile I again repeat that it was second to none in the matter of excellence of the promoting arrangements.

It may look selfisb on my part, hut wbat impressed me as being very near perfection was the press accommodations. It seemed a perfect treat to work with such facilities, comfortably seated in front of a desk, with a splendidly clear view of the course, and all information supplied you. In fact, it was too easy, I must suppose, for it so bappened that I got the name of the Grand Prize winner cabled to Paris before the race was won. In other words, through a miscalculation on my part, just before Wagner made his sensational final appearance, I made out Hemery to bave won by a small margin and flashed the news over. Luckily not more than two minutes elapsed before I corrected the error, but for some little time there must have been considerable jubilancy in the German camp over on the other side. Anyhow, this is a personal matter. But speaking again of the press arrangements for this race, I would like to point out that on our side the trouhle comes from the fact that there are so many "dead beads" who manage to squeeze in as so-called representatives of so-called newspapers, while it seemed to me in Savannah that everybody on that press stand meant business, and did it, too.

It was a bit novel to me that every one seemed to be not only delighted, but also highly surprised at the way the course was guarded and kept clear. In Europe, ever since the bloody Paris-Madrid race ended the chapter of town-to-town speed competitions and made way for the circuit road races, I have never seen or known it to be otherwise. But I understand that such has not by far always been the case in this country, and it being so, the satisfaction of the Savannah promoters was only natural. Perhaps we, too, in France shall have our share of trouble in that line, for just before leaving Paris I learned that a decree rendered by General Picquart, the Minister of War, stated that tbe army would no longer be used for anything but purely military purposes. Therefore, the French club may confront a very bothering difficulty in the promotion of the big race next year near Angers, as far as guarding the course goes.

Speaking of the course reminds me that I wish to say a word about the one in Savannah. It certainly was a tricky course on account of all the sharp turns, and now that it is all over, I wisb to confess tbat I bad my fears about accidents. Not only me, hut the competitors themselves, and this is clearly shown by the fact that during the evening before the big race, two of the most prominent among the French drivers (everybody will understand me omitting names) gave me all necessary instructions in case something should happen them. At the same time three of the mechanicians started a $100 pool, the proceeds of which were to go to the widow of whoever bappened to be killed in the race. All this would look ghastly enough if the event were not over and we did not know that no really serious mishap was

Duray, One of the Favorites in the Early Betting.

recorded. This goes to show not only what skill must drivers in a big race possess, but also that even those speed monsters called racing automobiles are marvels as far as running, reliability, and control go. Now, again, the course was exceedingly well arranged. Of course, it was tricky and difficult, and nobody could make it smooth and easy. But nobody either could have got it nearer perfection than the people who worked on it did. Some of those banked turns were perfect beauties, and going round them at top speed with an experienced driver, such as Hemery, like my friend Batchelder and myself did before the race, was a treat.

Another point where the A. C. A. and the Savannah promoters got us Europeans badly beaten is in the oiling of the road. Despite numerous inquiries, I am yet at a loss to understand the exact composition of the material used in Savannah, but I noticed that there was not a speck of dust on that homestretch, even when three cars came tearing along it, while on our side dust has always been a cause of nuisance. In fact, this year on the Dieppe course, despite liberal tarring, it was simply terrible.

The timing and scoring board arrangements were good, although I doubt if many people on the grandstand could see the figures clearly enough on the board. It also occurred to me, who sat in the press stand protected by a roof, that some of the ladies on the other side of the road must have felt that "Monsieur Phébus" was a bit too attentive. On both days, once the fog had lifted, it was very hot, and I am sure that people sitting in that grandstand would have enjoyed a canvas over their heads. This is a point on which Old Europe scores; in fact, the grandstands at both Dieppe and Bologna were to my mind far too luxurious and expensive for such a temporary affair as a two-day automobile meeting. But I suppose none of the spectators complained; at any rate, there may be quite a "happy medium" between the two ways of doing it.

A matter of great satisfaction to me was the superiority apparent, as regards the interest for onlookers, by racing held on a comparatively short circuit. For several years I have been, on the other side, fighting for a reduction in the length of the course on which the road races are held, but with only partial success. As an example, I would say that in 1906 the French Grand Prix was held on LeMans circuit, which measured over one hundred kilometers (63 miles) for one lap. The year after, under my management, the Dieppe course was brought down to 77 kilometers (48) miles), but we are yet far from the 25-mile circuit arranged for last week's big race in Savannah. It falls under common sense that the people who put up their money to see automobile races—and the enormous expense connected with the promotion of same shows that as many as possible are required—will enjoy the sight much more when cars are seen to pass frequently and their struggle can be more easily followed. This was the case last Thursday, and more so again the day before, as the small car event would have proved entirely tedious had it not taken place over a very short circuit. Without a doubt, here we have one of the reasons of the meeting's success, and also another of the points you do better here than on our side.

Showing the Road Markings of the "S" Turns.

In conclusion of this too lengthy article, I would really like to say a word or two of the way the Southern people treated the visitors, and more specially the foreigners. All the drivers, who were in Savannah a considerably longer time than I was, expressed themselves as highly delighted at the reception accorded them. They even hinted about not being used to this on our side of the ocean, which was perhaps hard on us promoters, but may be true. As an instance, the attention showed the drivers in Thursday's race in providing them with specially reserved seats from which they could view the proceedings on Wednesday, was an unprecedented thing at home, and it certainly pleased them immensely, for they expressed thanks most heartily.

Seymour and Simplex Which Made Best American Showing.

As for Southern hospitality, I suppose all has been said about it, and I could only repeat the tale of all visitors down there. Indeed, the Savannah Automobile Club members were indefatigable in their desire to attend to all the wants of this guests, and I wish to say the same of all the A. C. A. officials. As far as I am concerned, it was a great tribute paid to the paper which I had the honor of representing on this occasion, and it is a pleasant duty for me to return thanks to all the American gentlemen who contrived to make my work easy and enjoyable.

The European drivers returned to New York last Monday highly delighted with their Southern trip. The only exception was Fritz Erle, the German driver, who was injured in the race and whom the doctors will not allow to take the trip yet. He is in the Savannah Hospital, and, in fact, the latest news made him out to be not near so well as could be wished for.

All the other drivers leave New York on the French steamer *Lorraine* which sails to-day (Thursday) for Havre. They were the guests while here of several functions including the Automobile Show's luncheon on Tuesday, dinner at Paul Lacroix's the same day, lunch at the A. C. A. club house on Wednesday, and dinner with the Fiat Company as a conclusion of their stay.

HOW THE LANCIA-HILLIARD DRIVING-WON THE LIGHT CAR RACE

SAVANNAH, Nov. 25.—W. M. Hilliard, of Boston, driving tbe Lancia *Lampo,* entered by the Hol-Tan Company, of New York, won the international stock car race to-day. He covered the 196-mile course in 6 h. 43 min. 33 sec. Robert Burman, in a Buick, was second in 6 h. 49 min. 49 sec., and L. B. Lorimer, in a Chalmers-Detroit, was third in 6 b. 53 min. 55 sec. The winning car was equipped with Continental tires, and the second and third with Michelins.

Hilliard, the victor, is a veteran at road and track racing. He began his racing career by winning the Boston *Herald* trophy at the 1905 Readville track meet. On July 15 of that year he won the Mount Washington hill climb in a Napier. Later, he raced on Ormond and Atlantic City beaches. He was a contender in the Briarcliff at the wheel of a Shawmut car, and also drove a Lancia at tbe opening of the Long Island Motor Parkway.

The light car race, which was promoted by way of a curtain raiser to the Grand Prize, was run over ten laps of a 9.8 miles rectangular course. It was well attended by Savannahans and by the visiting throng of Northern and Western racegoers. Although the grandstand held 4,000 and the bleachers 5,000, the Georgians and Southerners generally awaited the running of the Grand Prize itself.

At 10 o'clock, an hour before the time set for the light car race, the chances looked slim for the impatient squadron of little fellows being sent off on time. A fog, which had been prevalent mornings for several days was again doing business at the old stand. But a quarter of an hour before the appointed starting hour Old Sol triumphed and sent the mist clouds scampering away into nothingness. The crowd began to pour into the aisles and boxes, and when 11 o'clock came more than half filled the granstand seats and boxes. The monster bleachers, however, carried not over a couple of thousands of their 10,000 capacity. It was for these that the railroads had sold coupon tickets, and the hig crowds of excursionists cared only for the big race of the morrow.

Seventeen nominations had been made for the light car race. Only 15 faced the starter. The American Aristocrat entrant had telegraphed the management three days before tbat it would not be on hand. Tbe Gregoire arrived on Sunday, but came in such an impossible condition that George Robertson very properly refused to undertake its pilotage, the risk being too great.

"Wag" had bad the cars drawn up in the order of their start for near balf an bour. Sharp at 11 o'clock he sent the S. P. O. away. The others were dispatched at half-minute intervals, except that Cameron started a minute behind Bergdoll and Burman a minute behind Poole, the American Aristocrat and Gregoire being counted the same as though present.

The order of the start was: Connors, S. P. O.; Hilliard, Lancia; Bergdoll, Chalmers; Cameron, Cameron; Poole, Isotta; Burman, Buick; See, Maxwell; Lorimer, Chalmers; Hearne, Buick; Costello, Maxwell; Burns, Chalmers; Easter, Buick; Munweiler, Maxwell; Jeffers, Buick; Kelsey, Maxwell.

Tbe crowd had not many minutes to wait for the appearance of the first car. It was the Lancia. The troubles of the S. P. O. bad begun early and in the first round it had dropped to the tail end of the procession, so far as the order of running went. Lorimer held his place bebind Hilliard. Burman made a splendid rusb from sixth to third place in line, the Buick far outstripping all the others with an initial lap in 10:58, a 53-mile an hour rate from a standing start. Little Ewing Easter, tbe New York midget, was second in actual time for his Buick.

It was up to Hilliard to be doing something, so he quickened his pace to 10:42. Even this failed to dislodge Burman from what seemed a good hold on first place. Another Buick, driven by Jeffers, took Easter's place in third position. Munweiler forced his Maxwell from ninth to fourth place with a lap in 10:05, the fastest to date, and, in fact, tbe second fastest round in the wbole contest.

Burman in Buick, Who Won Second Place.

In the third round Burman increased his margin over Hilliard by an even minute, and E. A. Hearne, the Chicago amateur, another Buick man, fought his way into third place, a position he kept stubbornly to the end of the race. Jeffers had broken a steering knuckle and was out of it.

Burman was evidently out for s killing, and did not let up a little bit on the 53-mile gait he had laid out for himself. Tbis widened the gap between him and Hilliard, who was driving the Italian car very conservatively a half mile slower to the lap. Hearne clung to third and Cameron worked up to fourth in this, the fourth lap. The air-cooled car's performance was watched with some interest, as it had been backed for $50 against $1,500 in the books to coin. The Lancia, by the way,

INTERNATIONAL LIGHT CAR RACE AT SAVANNAH, GA., NOVEMBER 25, 1908.

No.	CAR	Driver	1st	2d	3d	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th
2	LANCIA	Hilliard	3	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1
8	BUICK	Burman	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3	2	2	2	2
10	CHALMERS-DETROIT	Lorimer	6	7	5	5	4	4	4	4	4	3	4	3	3	2	2	2	3	3	3	3
11	BUICK	Hearne	4	5	3	3	3	3	3	3	3	4	3	4	4	4	4	4	4	4	4	4
6	ISOTTA	Poole	10	10	7	7	6	7	6	5	5	5	5	5	5	5	5	5	5	5	5	5
9	MAXWELL	See	8	11	8	8	8	6	7	6	6	6	6	6	6	6	6	6	6	6	6	6
17	MAXWELL	Kelsey	10	12	10	10	9	9	9	9	8	8	8	7	7	7	7	7	7	7	7	7
12	MAXWELL	Costello	13	13	11	11	11	10	10	10	10	10	9	8	8	8	8	8	8	8		
15	MAXWELL	Munweiler	9	4	9	9	7	8	8	8	7	7	7	9	10	9	9					
14	BUICK	Easter	2	6	12	12	12	11	11	11	11	11	10	10	9							
3	CHALMERS-DETROIT	Bergdoll	7	9	6	6	5	5	5	7	9	9										
5	CAMERON	Cameron	11	8	4	4	10															
1	S. P. O.	Connors	12	14	13	13																
16	BUICK	Jeffers	5	3																		
13	CHALMERS-DETROIT	Burns	0																			

was the pronounced betting favorite at three to one against it.

From the fifth to the ninth lap, both inclusive, the order was Burman, Hilliard, Lorimer. Cameron first bent his crankshaft in the fifth lap and in the next round for forced to retire altogether, having burned out his clutch.

The tenth round saw a shakeup of the score board. Hilliard during this and the preceding round let out a kink or two of the Lancia's speed. Burman was forced to return to his pit for a missing part, which provokingly could not he found by his assistants. It cost him a loss of some eight minutes, and the race itself, unless the Lancia had even more speed than Hilliard saw fit to exhibit to win. Burman's fatal lap took 19:08 to run. At its end the Buick was 3 min. 51 sec. behind the Lancia. Lorimer and Hearne all this time had heen seesawing hetween third and fourth places.

Another rather had lap for Burman was his fifteenth. It took him 15:47 to negotiate it. It cost him second place for the time being to Lorimer. In fact, it took three laps of hard riding for Burman to dislodge the Chalmers-Detroit as the runner-up.

In the seventeenth lap Burman regained second place. Hearne had dropped to third place in the twelfth round, and managed to hold it to the end, pursued in order hy Poole, See, and Kelsey.

This order—Hilliard, Burman, Lorimer, Hearne, Poole, See, and Kelsey—was maintained to the end. Hilliard beat Burman 6 min. 12 sec., who led Lorimer hy 4 min. 10 sec.

In the hattle of the tires, the Continental won first, the Michelin second, third, fourth, and fifth, and the Ajax sixth and seventh places. Hilliard won $500 in cash, offered hy the Continental Caoutchouc Company for first. Burman and Lorimer carried off substantial Michelin purses.

Bergdoll withdrew in the eleventh lap through a broken piston ring. In the fourteenth lap Easter ditched his car. His mechanic, Frank Thompson, was so hadly injured that he had to be taken to the hospital. Burns put his Chalmers-Detroit out of the race in the first round through a collision with a tree.

FASTEST LAPS, LIGHT CAR RACE.

No.	CAR	Driver	Fastest Lap	Miles per Hour
10	CHALMERS-DETROIT	Lorimer	10:12	57.63
8	BUICK	Burman	10:30	55.98
2	LANCIA	Hilliard	10:42	54.93
11	BUICK	Hearne	10:54	53.92
5	CAMERON	Cameron	11:01	53.35
12	MAXWELL	Costello	11:02	53.28
14	BUICK	Easter	11:06	52.92
16	BUICK	Jeffers	11:08	52.77
3	CHALMERS	Bergdoll	11:11	52.56
6	ISOTTA	Poole	11:24	51.58
15	MAXWELL	Munweiller	12:02	48.06
9	MAXWELL	See	12:19	47.73
17	MAXWELL	Kelsey	12:44	46.14
1	S. P. O.	Connors	19:17	31.69
13	CHALMERS	Burns		

INTERNATIONAL LIGHT CAR RACE OF THE A. C. A. AT SAVANNAH, GA., NOVEMBER 25, 1908.

No.	CAR and Driver	9.8 Miles	19.6 Miles	29.4 Miles	39.2 Miles	49.0 Miles	58.0 Miles	68.6 Miles	78.4 Miles	88.2 Miles	98.0 Miles	107.8 Miles	117.6 Miles	127.4 Miles	137.2 Miles	147.0 Miles	156.8 Miles	166.6 Miles	176.4 Miles	186.2 Miles	196.0 Miles	Average miles per hour
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	
2	LANCIA Hilliard	11:43 11:43	22:25 10:42	34:16 11:51	45:32 11:16	56:55 11:03	68:15 11:20	79:32 11:17	91:15 11:43	102:14 10:59	113:08 10:51	123:59 10:51	134:50 10:51	145:51 11:58	157:19 11:28	168:46 11:27	179:55 11:09	190:52 10:57	201:43 10:51	212:40 10:57	223:33 10:53	52.59
8	BUICK Burman	10:58 10:58	21:52 10:54	32:43 10:51	43:31 10:48	54:30 10:59	65:12 10:42	76:01 10:49	86:55 10:54	97:51 10:56	116:59 19:08	127:27 10:68	137:57 10:30	148:27 10:30	164:14 15:47	176:47 12:33	187:24 10:47	197:57 10:33	208:40 10:43	219:15 10:35	229:45 10:30	51.44
10	CH'LM'RS-D. Lorimer	12:04 12:04	24:17 12:13	36:30 12:13	48:24 11:34	60:38 12:14	72:57 12:19	83:09 10:12	94:45 11:34	107:03 12:18	117:41 10:38	130:41 13:00	142:23 11:82	153:01 10:38	164:03 11:02	174:59 10:56	186:30 11:31	199:13 12:43	212:01 12:48	224:44 12:43	233:55 11:11	50.25
11	BUICK Hearne	11:48 11:48	23:35 11:47	35:20 11:45	47:26 12:06	59:17 11:51	71:03 11:46	82:41 11:38	94:16 11:35	105:27 11:11	119:19 13:52	130:13 10:54	143:57 13:44	155:18 11:21	166:39 11:21	178:02 11:23	189:21 11:19	201:10 11:49	214:44 13:34	226:43 11:59	238:04 11:21	49.60
6	ISOTTA Poole	13:26 13:26	26:10 12:44	38:48 12:38	51:10 12:22	63:53 12:43	77:09 13:16	88:33 11:24	100:57 12:24	113:14 12:17	125:38 12:24	138:06 11:24	150:35 12:29	162:50 12:15	176:48 13:58	189:28 12:40	201:50 12:22	214:11 12:21	226:37 12:26	239:00 12:23	251:22 12:22	46.79
9	MAXWELL See	13:12 13:12	26:13 13:01	39:02 12:49	51:43 12:41	64:18 12:35	76:52 12:34	89:23 12:31	101:55 12:32	114:43 12:58	127:16 12:33	139:46 12:30	153:53 14:07	166:33 12:40	179:52 13:19	194:00 14:08	208:03 14:03	220:26 12:23	232:55 12:29	245:14 12:19	258:38 13:24	45:46
17	MAXWELL Kelsey	13:26 13:26	26:38 13:12	39:41 13:03	52:39 12:58	65:33 12:54	78:29 12:56	91:26 12:57	104:21 12:55	117:12 12:51	130:55 13:43	144:48 13:53	157:32 12:44	170:27 12:55	183:17 12:50	196:10 12:53	208:58 12:48	221:55 12:57	234:55 13:00	247:56 13:01	260:44 12:48	45.07
12	MAXWELL Costello	21:47 21:47	35:06 13:19	54:29 19:23	68:54 14:25	82:26 13:12	95:44 13:18	108:42 12:58	121:58 13:16	135:10 13:12	154:45 19:35	165:47 11:02	178:50 13:03	191:55 13:05	205:06 13:11	221:09 16:03	234:26 13:17	247:44 13:18	261:07 13:28	Still running at end of race.		
15	MAXWELL Munweiler	13:17 13:17	26:22 13:15	39:16 15:54	52:12 12:56	64:14 12:02	77:59 13:45	90:44 12:45	103:28 12:44	115:54 12:26	128:23 12:29	140:44 12:21	181:22 40:38	223:08 41:46	235:51 12:43	255:55 20:04	Still running at end of race.					
14	BUICK Easter	11:06 11:06	23:46 12:40	95:00 71:14	106:16 11:16	117:38 11:17	128:41 11:08	139:51 11:10	150:57 11:06	162:04 11:07	173:14 11:10	184:32 11:18	195:40 11:08	207:08 11:28	Broke rear axle. Car left track at Waters road and Estill Avenue; driver and mechanic both injured.							
3	CH'LM'RS-D. Bergdoll	13:08 13:08	25:51 12:43	38:07 12:16	49:08 11:11	62:28 13:20	76:07 13:39	88:31 12:24	102:35 14:04	126:42 24:07	140:09 13:27	Withdrawn; defective ring broken on piston spring, and a hole punched in piston head.										
5	CAMERON Cameron	14:10 14:10	25:20 11:10	36:27 11:07	47:28 11:01	66:27 18:10	Bent crank shaft; ruined clutch; out of the race.															
1	S. P. O. Connors	19:17 19:17	133:04 113:48	222:03 88:59	259:41 37:38	Car running at end of race. Nut got in a cylinder, breaking spark plug, and oil lead broke.																
16	BUICK Jeffers	12:02 12:02	23:10 11:08	173:54 150:44	Bent steering knuckle on Montgomery cross road. Out of race.																	
13	CH'LM'RS-D. Burns	On first lap hit a tree on Montgomery cross road. Burns slightly injured. Car out of race.																				

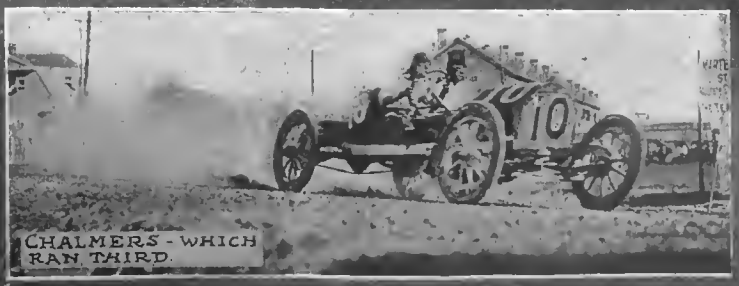
MAXWELL - "STILL RUNNING"

CAMERON - ONLY "AIR-COOLER"

DOWN THE HOMESTRETCH

OF COURSE HILLIARD AND STROBEL SMILED

BUICK - WHICH MET WITH DISASTER



CHALMERS - WHICH RAN THIRD.

SOME OF THE TROUBLES OF THE LIGHT CARS

THE troubles that beset several of the light cars during the ordeal were those common to larger machines, some of them being entirely due to the cars not being well prepared, while others were the outcomes of carelessness on the part of tbe drivers. Hilliard, in his Lancia, was entirely free from trouble from start to finish, the only time he lost on the twenty laps being 15 seconds, when he stopped in the fourteenth lap to take on a couple of gallon cans of oil that the mechanician made use of during the remaining laps. Throughout the twenty laps the car ran with commendable regularity, doing all of the laps in 10 and 11 minutes with extra seconds. It was the only car in the race to do every lap but one in less than 12 minutes. Lap after lap as it came down the stretch Hilliard seemed out on a pleasure jaunt, but circumstances proved that he seemed to be getting the maximum speed out of it.

Burman's Buick that landed second honors, had troubles all of its own whicb apparently could be traced to the use of too light springs in connection with the underslung frame used. On the thirteenth lap both of the rear springs broke, and from that time until the finish of the twentieth the rear end of the car was carried from the axle by two chains and two straps whicb had been fitted as a precaution before the start of the race. As a result of these breaking, the right rear brake connecting rod snapped and the gasoline tank, a large cylindrical one in the rear, shook loose, shearing off a couple of bolts in the metal straps that held the tank in place. The shearing of these bolts meant going back over a part of the course to the Buick headquarters, where other bolts could be obtained. After once fixed, the gasoline tank gave additional trouble, and once or twice when the car swept past the grandstand the mechanician was holding the tank in place. Still a further outcome of the broken spring was breaking off, dne to vibration, the oil lead from the hand oil pump to the crankcase, so that for the last four or five laps the engine oil supply was the splash within the crankcase. Of his twenty laps, seventeen were made in less than 11 minutes each, a most remarkable performance when it is remembered that the winning Lancia only made eight laps under the 11-minute mark. Burman had three slow laps, the tentb, fourteenth, and fifteentb, in which he lost practically 17 minutes time as compared with his averages for the remaining seventeen laps. During the entire race the bonnet on his car was not lifted.

L. B. Lorimer's Chalmers-Detroit, which won third position, required six laps before it got into proper running condition and during which time four or five stops were made because of the carbureter float sticking, as Lorimer expressed it. In several instances it was necessary to get out of the car and open the bonnet before the trouble could be rectified, whereas at others rapid changing of the throttle worked the desired results. Only once during the contest was gasoline taken on, 5 gallons sufficing, and at this time the oil supply was looked after, both being done by one man, while the other worked on the carbureter. From the grandstand point of view Lorimer's performance was a race against Hearne's Buick, while Burman's Buick and the Lancia were fighting it out. At the end of the seventh lap Lorimer passed the granstand not 100 yards in advance of Hearne, and when they bore in sight at the end of the eighth they were in the exact same position, neither having the advantage of 10 yards over the other in the entire lap. On the ninth lap Hearne passed him, but stopping at the end of this lap for water and oil gave Lorimer a chance to rush past while the fuel replenishment was being made. Hearne stopped again in the seventeenth lap to take on oil and water and also put water on the tires. Hearne made fourteen of the twenty laps in 11 minutes and some seconds, but only in the eleventh lap did he get below the 11-minute mark. All through his driving was most consistent, having but three laps in which 13 minutes and some seconds were needed to do the 9.8 miles. His winning fourth place was a popular achievement because of his amateur standing, whereas many of the drivers he was fighting with were professional factory representatives.

Al. Poole, with the "Baby Isotta," wbich was given fiftb position, made a most consistent running, the car stopping but once in the twenty laps, wbich was at the end of the fourteenth to take on gasoline and water. Throughout the race the little motor was turning over at close to 2,600 revolutions per minute, and as the Isotta factory rates it at 17 horsepower at 2,000 revolutions per minute, its working power averaged close to 22 horsepower. Every time it came down the stretch it was running with the same regularity and rbythm, and it looked as if it could keep the performance up for an endless time. Sixteen of its laps were made in 12 minutes and some seconds, three of them requiring 13 minutes and some seconds, and one was made in 11 minutes and some seconds, it never getting below the 11-minute mark.

The next four positions went to the four Maxwells, No. 9 driven by Arthur See being first and C. W. Kelsey's No. 17 next, both of which completed the twenty laps. These two were the cars with 5-inch motors of the regular Maxwell 20-horsepower variety. The other two Maxwell Juniors, excepting the cylinders had 4.25-inch bore, did not complete the circuit of twenty laps, but were running at the finish, No. 12, driven by Thomas Costello, having finished nineteen laps, and No. 15, piloted by Joseph Muntweiler, baving finished fifteen laps. As was expected before the start, all of the Maxwells kept running, and while their speed was not equal to that of their four-cylinder opponents, they set an excellent example in the rôle of consistent working. Muntweiler's No. 15 had trouble in the twelftb lap when speeding along Water's road, the left front wheel came off letting the steering pivot drop onto the hard road. Muntweiler avoided an accident by noticing the wheel wobbling and applying the brakes. The trouble was due apparently, according to the driver, to leaving the cotter pin, whicb holds tbe nut on the pivot, out. As it was, the wheel did not stop rolling until in an adjoining field. Muntweiler pluckily set to work and got it on again, but had trouble with the nut because of the threads on the spindle being ruined when it fell on the road. After the first repair it ran for 1 1-2 miles, when the wheel again came off, this time unexpectedly and when traveling fast, with the result that when tbe axle fell it formed a pivot on the road turning the car completely around. After a second repair the car was able to reach the repair pit at the grandstand, where a new steering pivot was secured. This delay caused 40:38 and 41:46 to be the time for the two successive laps, but in spite of this the little car kept going and was running wben the race was called off. Costello, with the other little Maxwell, had a puncture in the third lap, the only one of the four Maxwells to have any trouble with tbe Ajax tires. In spite of this he made tbe lap in 19:23, but stopped at the grandstand and took on a new tire; this stop being just at the start of the fourth lap made his time in this lap 1 minute longer than the average of the remaining sixteen laps he negotiated. Kelsey, in No. 17, had no troubles of any nature and made one stop, in the tenth lap, to take on gasoline. Kelsey's performance was consistency personified in that he did thirteen of the laps in 12 minutes and some seconds, and the remaining seven laps in 13 minutes and some seconds, there being but 1 minute and 9 seconds difference between his fastest and slowest lap in the entire twenty circuits. Arthur See, driving the No. 9 Maxwell, however, beat Kelsey 2 minutes 6 seconds in the twenty laps, but did not do such consistent work, requiring 14 minutes and some seconds for three of the laps and setting a low-water mark of 12:15 for one lap as against Kelsey's low figure of 12:44. Compared with these times, however, Muntweiler, with the little Maxwell, made considerably faster time, doing five laps below the 12:55 mark set by Kelsey and setting a record lap figure for the Maxwells of 12:02, or approximately 49 miles per hour for the 9.8 miles. See's car stopped in lap 15 to take on oil and

Hilliard's Lancia Making Its Speed Evident by Passing Easter's Buick Rounding One of the Turns.

adjust the steering gear and in lap 19 he stopped for gasoline.

H. Connors, in the S. P. O., which was running at the finish, but had just completed the fourth lap, was in hard luck from the start. The car had been rebuilt from a different model touring car after its accident of the previous Saturday, and Connors and his assistants had worked night and day upon it. The back wbeels had a wider tread than the front ones, and several other glaring irregularities were noticeable because of the impossibility of getting duplicate parts to do the rebuilding with. The first lap was made in 19 minutes and some seconds, but in the second trouble with the engine developed.

Of the six cars that were not running at the finish, the first to drop out was unlucky No. 13, Chalmers-Detroit, driven by W. R. Burns, which just covered 4 miles of the required 196 miles and was the only machine not to make a complete lap. On the second bank turn, on the White Bluff road, the car's front wheels, provided with plain tread tires, failed to hold the turn and skidded over it, and the car collided with a tree throwing the mechanician out, and Driver Burns, remaining in his seat, was rewarded for his heroic efforts by losing four of his front upper teeth and injuring tbe roof of his mouth by striking upon the steering wheel. The accident was not due to taking the turn too wide, but too fast for the plain-tread tires. The heavy fog of the early morning was equivalent to a rain, and in connection with the oil made a slippery surface.

Not an bour later anotber car came to grief on this same turn, Earl Jeffers in No. 16 Buick being the victim. Jeffers, like Burns, was traveling fast and made the turn well, but just when straigbtening up on the Montgomery road the left steering knuckle arm broke, the wheel wobbled for a while, and then the car headed for the left side of the road.

Tbe little four-cylinder Cameron air-cooled car, with its 32-inch wire wheels, was the next car to drop out, which it did after reaching the grandstand on the fifth lap, when it pulled into the open space at the end of the pits and remained until the end of the race. Its trouble was due to burning out of the clutch. This little car made a most auspicious start, and while its first lap was a little slow, the next three were made in 11:10, 11:07, and 11:01, and everybody began to look for a duplication of its performance in the Sweepstakes, but were rudely disappointed a lap later wben it witbdrew. Although this car was very light, it held the course beautifully, and made the fastest getaway at the start of the race.

L. J. Bergdoll's No. 3 Chalmers-Detroit followed the Cameron withdrawal at the end of lap 11. This car was handicapped in that the car did not reach Savannah until Tuesday, the day before the race, and the 3.75-inch cylinders arrived a couple of days earlier. The regular 3.875-inch cylinders had to be removed, being too large for the race, and the smaller ones placed on. They were new and had to be worked in, and there was no time for this. As a result, the motor heated during the run, which caused a loss of time. Bergdoll also used bevel-seated valves, and it was with one of these that the trouble arose which put him out of the running. The valves are located in the cylinder heads and shearing the pin in one of the stems against which the washer for the valve-spring seating rested, allowed the valve to fall into the cylinder, and the piston was broken, putting the car out of racing commission. It was withdrawn and stood in the space at the end of the repair pits until the race was over. The car stopped at the end of lap 9 and withdrew at the end of lap 11.

The last car to drop out was No. 14 Buick, driven by Hugh Easter, which broke its rear axle when making the banked turn off Water's road onto the homestretch, which resulted in ditcbing the car over the outside of the banked turn and severely injuring Mechanician Thompson.

The rules allowed of using a four-cylinder motor with 3.75-inch bore and any stroke, and the three Chalmers-Detroits and four Buicks availed themselves of this measurement; the winning Lancia had a bore of 3.5 inches, the S. P. O. 3.75, the Cameron this limit also, and the Baby Isotta 2.43, being the baby of the lot. The mosquito fleet of four Maxwells comprised the only two-cylinder contestants, all of them having the conventional Maxwell motor with the two opposed cylinders mounted crosswise in front of the dash and in two sizes, Nos. 12 and 15, having 4.25-inch bore, and Nos. 9 and 17 with 5-inch bore, which was the maximum permitted in a two-cylinder machine.

Of the four-cylinder machines four, the three Chalmers-Detroits and the Isotta, used cylinders formed in one casting, the Isotta having the intake and exhaust valves in the cylinder beads with one rocker arm for each valve and an overhead camshaft which, witb the rocker arms and valve cages, entirely enclosed by an aluminum cap, which forms an oil-tight compartment within which a splash occasioned by tbe rocker arms is maintained for the cams and rocker arm parts. The Lancia, Buicks, and S. P. O. have cylinders cast in pairs, the Buicks with valves in the heads, and the other two with valves in the bottoms of chambers on one side of the cylinders. Remy magnetos were on the Cameron and Nos. 8 and 16 Buicks, the two latter with underslung frames, and on all of the other contestants were Bosch high-tension magnetos with a spare battery system carried on the majority of them. All of the Buicks were fitted with Schebler carbureters, the Chalmers-Detroits with Kingstons, the Cameron with a Breeze, the Maxwells with tbe stock Maxwell carbureter, and the Isotta, Lancia and S. P. O. with types of their own make. Tbere was a strong tendency shown toward three-quarter elliptic springs in the rear, five of the cars, the three Chalmers, S. P. O. and Lancia, being so fitted; the two 4.25-inch Maxwells used elliptic springs all around and the two 5-inch ones semi-elliptics; the two Buicks, with frames carried above the axles, used elliptics in the rear, and the two with underslung frames used a style of inverted semi-elliptics which resembled two very short inverted semi-elliptics placed end to end with a short uniting straight piece between them and whicb served for attaching to the axles tbrough the usual clips. The springs on the majority of the cars were well wrapped with tape and shock absorbers. Hartfords were fitted all around on the three foreign machines, Lancia, Isotta and S. P. O., whereas not an American car fitted an absorber of any nature other than rubber bumpers and leather rebound straps.

Nine of the fifteen cars carried Michelin tires; the four Maxwells carried Ajaxes; the S. P. O. was fitted with Pennsylvanias, and the Lancia with Continentals.

(*Story of the Grand Prize continued on Page 795.*)

BENEFITS DERIVED BY HEAT TREATING STEEL*

By THOMAS J. FAY, President Society of Automobile Engineers

METALLIC salts are superior to metals for heat baths in heat-treating work because higher temperatures are possible on one hand, and lower initial temperatures are possible on the other. It is one of the objects in heat-treatment work, to be able to raise the temperature of the parts slowly, from a low temperature to the ultimate temperature. This would not be possible in a metallic bath because the heat of the bath cannot be less than the temperature of the melting point of the metal. Tbe use of metals with a low melting point would not serve the purpose because with metals it is not feasible to keep on increasing the temperature to any extent.

Metallic salts on the other hand can be controlled within very wide limits, as for illustration, if it is desired to attain a maximum temperature of 1,000° C. from a very low initial temperature, it is only necessary to provide the metallic salts as follows:

1,000° C. METALLIC SALTS HEAT BATH.

(NaOH)	Sodium Hydrate	8%
(NaCl)	Sodium Chloride	91%
(KNO)	Potassium Nitrate	0.5%
(K_2CrO_4)	Potassium Chromate	0.5%

Up to 1,000° C. this bath will not vaporize, hence it is available for use in heat-treating work for the purpose of heating steel previous to quenching, for any temperature up to the maximum, as stated. If, on the other hand, a higher temperature than 1,000° C. is desired, then it is necessary to use:

Pure Crystalline Chloride of Barium.

The melting point of this material is about 950° C., hence in using it the materials must first be heated in a bath of such metallic salts as will melt at a lower temperature, if it is a fact that suddenly beating the steel at such a high point will affect the results adversely. The chloride of barium salts will allow of a temperature of 1,350° C.

If chloride of barium and chloride of potassium are mixed in the ratio of 3:2 the result will be a metallic salt bath that will give good results up to 950° C., with a melting point 670° C., but as before stated, if the melting point is to be lower, the 1,000° C. bath is the proper one to use. By varying the proportions of the salts it is possible to fix a variety of temperatures both initial and final. The advantages of the salt bath are obvious, since the immersed steel takes on the temperature of the bath and the steel is protected from contact with all else besides.

It has been found that the salts do not affect the steel in any way and in transferring the steel from the salt bath to the quenching bath the steel is protected from atmospheric contact, so that the steel remains clean and free from surface oxidation. This question has received much attention at the hands of Dr. Geo. W. Sargent, Metallurgist in Chief of the Carpenter Steel Co. in America, and while the salts gave trouble in a steel wire process by clinging to the wire (thus clogging the dies), it was not the claim of Dr. Sargent, in his discussion of the matter, that the salts imparted any bad qualities to the materials of which the wire was composed.

Methods of Using Metallic Salts.

In Germany, the method of heat treating with metallic salt baths, has been advanced to a high state of perfection, and it is believed there is no question of deterioriation of the steel, as a result of contact with the salts. The author is indebted to Dr. Sargent for much valuable information on the subject, and it is believed it was to him the introduction of said method of heating (in America) must be accredited.

NOTE.—The investtgatton of the metallte salts for thts purpose was conducted tn Germany by Mr. Joseph Schaeffers, M.E., Mem. S.A.E. and A.G.T. (Ger.) tn 1906-7, for the author.

*Continued from page 741, "The Automobile," tssue of Nov. 26.

The equipment may be regarded in substance as an electric heater. Tbe heater itself consists essentially of an iron container of suitable size, lined with asbestos brick faced with fire clay. The cavity within is then filled with the salts and the electrodes are so placed as to require the electrical current to traverse the salts to form a connection, in other words the circuit is completed by the salts between tbe electrodes. A pyrometer inserted in the molten salt bath shows the temperature of the bath and the steel immersed in the bath will take on the temperature of the same.

The electrodes are of iron (flat plates). The iron of the lowest carbon (soft Swedish iron) best serves the purpose. The electrical current is alternating about 50 periods, at about 190 volts electromotive force. It is at first necessary to melt the salts before the hardening process can be started and a path for the current (of lower resistance) must at first be provided. As soon as a molten streak is formed in the salts the process then proceeds without further difficulty.

"Atoms of chlorine and barium are set free at both electrodes, the chlorine combines with iron to form chloride of iron while the barium and free iron." The iron being heavier than the liquid salts, falls to the bottom of the heater, from whence the excesses may be removed at will, while tbe salts are molten. The iron is simply scooped out of the molten bath.

The heat regulation is very simple, since by raising or lowering the voltage of the electrical current the current strength will fluctuate accordingly. The electrical energy is accordingly changed to suit the occasion in the manner as follows:

$$W = E\,I = I^2Z = E^2/Z = \text{Energy in watts.}$$

In which:

I = The square root of mean square current in amperes.

E = The square root of mean square electromotive force in volts.

Z = The impedance of the circuit (salts) between the electrodes.

It will not be necessary to go into the question here of the phenomena of the alternating current circuit in metallic salts bath, because the problem from the point of view of the heat treatment of steel does not demand exact knowledge of the details of the alternating circuit.

That the impedance Z will change with the temperature is true, but the means for varying the voltage being at hand and adequate for the purpose renders it unnecessary to investigate this phase of the subject.

Witb the increasing impedance it will be necessary to increase the electromotive force at a somewhat higher rate, because with the increasing temperature, the heat losses will be more. The current strength should slightly increase then, and tbis will be at the expense of increasing voltage.

The heat equivalent of the electrical energy will be as follows:

$$H = I^2\,Z\,t\,0.24 = \text{small calories.}$$

In which:

t = time in seconds;

I and Z as before.

With means for ascertaining the heat equivalent of the electrical energy, it is just as feasible to use the electrical current for the purpose as it would be to use any other source of heat. The electrical means of heating is the more convenient, because the heat is delivered to every molocule of the salts with great uniformity and the conditions are perfectly satisfied.

The cost of the electrical energy is not high, in comparison with the service rendered. For a heater 6.25 x 6.25 x 7 inches the electrical energy consumption was reported as follows:

Temperature.	Energy in kilowatts.
880 degress C.	5.4 per hour
1,400 degrees C.	8.5 per hour
1,300 degrees C.	12.25 per hour

Besides the cost of the electrical energy, there is the replacement of the iron electrodes, which is but a small item; then there is the replacement of the salts as they are volatilized. This is not a large item, since the replacement will not exceed two pounds of barium salts per hour.

The inside of a heater, if it is a crucible, which would be very satisfactory (a clay pot) for the purpose, would last for an indefinitely long time, because, even if it were to split, the salts would seal the opening again and there is no other wear. The amount of hardening that can be done with an outfit of this sort will be very considerable, since the control is rapid and accurate. The pieces to be treated would quickly raise to the desired temperature in the bath, and to repeat the process would be a very simple thing to do.

Correct Temperature Observations.

Any suitable pyrometer will serve to take temperatures. That the galvanometer used for noting the strength of the current should be "dead beat" and accurate goes without saying. Such outfits as the Le Chatalier pyrometer would serve admirably the purpose, with the proviso that a master galvanometer be available for use in checking the working instruments. This would be true with any system, moreover; the check instrument should be available even in small plants.

The check galvanometer should be sent to a testing laboratory at regular intervals to be calibrated, and it should be mounted in a suitable place during the period of its service. There are various types of galvanometers among which the D'Arsonval, all of which can be provided with a scale to read temperature degrees instead of angular deflections or milli-amperes as the case may be. If the means for heating are to be quick and accurate, surely the provision should be something besides a tub of dirty water. The several quenching baths are as follows, named in the order of merit:

(I) mercury;
(II) acidulated water (ice cold);
(III) salt water (ice cold);
(IV) salt water (normal);
(V) water;
(VI) water and skim milk;
(VII) lime water;
(VIII) fish oil;
(IX) cod-liver oil;
(X) cotton-seed oil.

The mercury may not be used excepting for very small parts in view of the poisonous vapors it emits. The water quenches are more to make parts very hard, while the oils render parts tough and less hard. Double quenching is sometimes resorted to, the idea being to attain toughness and considerable hardness besides.

For quick work it is desirable to provide a means of maintaining the quenching baths at a constant temperature. There are diverse ways of accomplishing this feat, among which a pump to circulate the liquid and a cooler with a fan to abstract the heat from the same. The usual methods of cooling automobile motors would serve perfectly well.

There are various other ways of fitting up to accomplish the several ends. On the whole the idea has been to advocate even indirect heating, rather than to allow the parts to contact with the fire direct or for that matter with the heated products of combustion as in a muffle furnace. The muffle furnace is good, but the molten bath is better. The order of merit of the several methods then would seem to be as follows:

(I) molten salt bath (electric heater);
(II) muffle furnace (gas heater, or, oil);
(III) open forge (charcoal fire);
(IV) bunsen burner (direct flame).

The forge is better than the Bunsen burner because in the forge it is possible to cover the parts and to so urge the fire as to bring the parts up to the desired temperature slowly and more evenly than with the Bunsen burner. Both methods are very defective from the point of view of the best results.

The quenching equipment should serve for the purpose, no matter what may be the means of heating. The annealing methods on the other hand can be varied, to suit the occasion and the materials. A bed of lime does very well; ashes serve for some purposes; allowing the parts to cool in a muffled furnace is still another way.

Tempering at temperatures below 350° C. may well be done in oil. The parts may be placed in oil and the same can be gradually raised to the desired temperature; there to be held for the requisite period depending upon the mass and quality of the material. If higher temperatures are demanded, the parts can be transferred to the molten salt bath; there to be raised to the desired temperature.

Tempering is a matter not always fully understood. The mere raising the temperature to some predetermined point is not likely to be productive of the anticipated results. If a part is very thin, of no great mass, it is possible to temper (draw the temper) by virtue of the mere application of the heat requisite to raise the temperature of the mass to the predetermined point. If, on the other hand, the mass is considerable and the section is more or less the same in all planes, a time factor must be introduced.

The time required to temper a piece depends upon the mass and upon the state in which the piece happens to be. It is equally a fact that some grades of steel will be more persistent than others. Nature hard steel (steel that habitually resides in the hard state) will not so readily consort with softness, as the products of the character "normally soft" and difficult to render hard.

For tempering, the lead bath is sometimes used, or lead antimony may be employed. It is even possible to use alloys of the white metals to afford temperatures differing by quite small increments. In all such cases it is plain to be seen that to some extent, at any rate, the metal will adhere to the parts to be treated; thus becoming a nuisance.

MELTING POINT OF ALLOYS.

Lead.	Tin.	Bismuth.	Degrees Fahrenheit.	Degrees Centigrade.
1	1	1	250	121.1
2	2	2	292	144.4
3	3	1	310	154.4
4	4	1	320	160.0
6	1	0	381	193.8
1	2	0	441	227.2
1	3	0	482	250.0
1	5	0	511	266.1
1	10	0	541	282.7

These metal baths should be covered with charcoal powder else they will oxidize away very rapidly indeed. The exactness of the temperature depends upon the purity of the metal and the exactness of the proportions. The temperature will remain constant just so long as some of the metal is melting; temperature will raise after all is liquid, if heat is urged.

The melting point of the pure metals unalloyed would be as follows:

Lead.....618 degrees F. = 325.5 degrees C.
Tin.....446 degrees F. = 230.0 degrees C.
Bismuth.....507 degrees F. = 263.3 degrees C.

Zinc would serve for a somewhat higher temperature if it could be used at all, but it would cling to the metal to be tempered with great tenacity. Lead alone affords a good means for tempering parts to be tough but not file hard. Bismuth would, if used, result in considerable hardness of the quenched parts, in view of its comparatively low melting point. If the temperature of the molten metal is allowed to increase, after the metal is all dissolved, the poisonous vapors given off will be very detrimental to the health of the artificer, and it is a question if it is humane to allow work to be done regularly in this way.

At all events men who work around lead baths should be very careful not to inhale the fumes. The arrangement of the bath should be such as to have the fumes sucked up a "flue" or a

suitable fan of good design. It is quite general to attempt to judge temperatures by color, but, as it is quite well appreciated by mostly every one connected with the art, to judge correctly is a difficult, if not an impossible, undertaking. The susceptibility of the "retina" of the eye of the observer to light, would be a fair constant in a place of "constant illumination," or in the dark under well defined conditions, yet even so no two observers would reach the same conclusion. The generally accepted temperatures in relation to color may be set down as follows:

TEMPERATURES CORRESPONDING TO COLOR. (M. Poullett.)

High temperatures.	Degrees.
Incipient red heat	977 F. = 525 C.
Dull red heat	1,292 F. = 700 C.
Incipient cherry red	1,472 F. = 800 C.
Cherry red	1,652 F. = 900 C.
Clear cherry red	1,832 F. = 1,000 C.
Deep orange	2,022 F. = 1,105 C.
Clear orange	2,192 F. = 1,200 C.
White heat	2,372 F. = 1,300 C.
Bright white	2,252 F. = 1,400 C.
Dazzling white (maximum)	2,912 F. = 1,600 C.
Dazzling white (minimum)	2,732 F. = 1,500 C.

The melting point of steel depends upon the composition, as for illustration: The carbon has a marked effect upon the melting point. For each point of carbon in the steel the melting point is lowered *one degree centigrade*. On this account it is not possible to fix a definite temperature for the white heat bordering upon the melting point of the steel. The colors above set down are for products showing color due to high temperatures. Steel in the comparatively cold state will also show color consistent with its *temper*, and in tempering steel it is common practice to go by that color. It would be better, of course, to temper to a definite temperature by the pyrometer. The usual values accepted for the temper corresponding to color in comparatively cold steel may be set down as follows:

TEMPER COLORS.

Low temperatures.	Degrees.
Deep orange	421 F. = 216.1 C.
Orange	473 F. = 245 C.
Red	509 F. = 265 C.
Violet	531 F. = 277 C.
Indigo	550 F. = 288 C.
Blue	559 F. = 293 C.
Green	630 F. = 332 C.
Oxide gray	752 F. = 400 C.

The temperature in degrees C. is given in round numbers for convenience; the error is but slight. In noting the temper color is it necessary to polish a spot on the steel? Different observers will reach different conclusions. A fair conclusion is but the result of experience. Temper colors will not develop excepting in the presence of air; moreover, the parts have to be bright to show the colors clearly. The colors do not develop always at the same temperature, because the steel is not always of the same composition. If the color shows readily in a given specimen of steel it will be a fair inference that the steel quenches to great hardness

In some grades of steel the color will *rub off* readily. This will be in cases involving steel that does not quench to great hardness. The best temperature of quenching is the temperature that affords the requisite hardness. The lowest possible temperature should be taken in every case, allowing, of course, for the desired hardness. In tempering the reverse is generally true. The temper should be drawn at the highest temperature that will enable the steel to be used for the given purpose. In drawing the temper the mass of the pieces to be tempered must be taken into account. They must be left in the bath long enough to make sure that the steel is up to the temperature of the bath itself. Fixed instructions as to the time are not possible, because of the considerable differences in conditions.

For tempering, the bismuth bath affords the right temperature for a considerable variety of articles, as taps, dies, numerous tools of carbon, steel, and springs for some purposes. Certain animal oils serve the purpose also. In using the oil bath it is necessary to exclude the air or the oil will take fire. Burns from oil are particularly painful and even dangerous.

It might be well here to define what is meant by tempering. If by quenching we mean hardening, then by tempering we mean "drawing the temper," or, as they say, "letting down." On the other hand, it is not uncommon to say tempering is hardening (result of quenching), whence drawing the temper is the converse. The author argues that "temper" is a final condition, hence drawing the temper is in the act of tempering. Quenching, then, is not tempering, unless the parts are to remain as quenched. They never are left as quenched in practice, and it is not uncommon to say, "quenching and tempering," that is to say, "hardening and tempering," or hardening and subsequently annealing would amount to the same thing.

It is not the purpose of the author to struggle with the vagaries of the language used by mechanics more than to attempt clearness sufficient to render the meaning apparent and to avoid license, excepting when that same license will serve a useful end.

(*To be continued.*)

THE GENERAL ASPECTS OF AUTOGENOUS WELDING

THIS process of joining metals seems to offer a solution to many difficult problems, and in some respects is more favorably regarded than the better known electric welding process. The limit of application is a matter that will have to be settled in the future as the product of experience, and for the present it will suffice to confine discussion to the elimination of fallacies, as, for illustration, it is said that aluminum cannot be welded by the autogenous method, whereas the contrary is true. The autogeneous process consists essentially of uniting metals by intervening a molten mass of substantially the same material. The high heat (6300 degrees Fahrenheit) is so intense that the melting phenomenon is localized. To more clearly illustrate the process attention will be called to the old method by which lead is burned together through the good office of a hydrogen flame, in which the needle-like flame is directed against the faces to be joined and the metal on the faces melts, bridges across, and the whole operation is performed so quickly that the joint is made before much heat is imparted to the mass as a whole, hence the shape as a whole is not destroyed. Aluminum is a peculiar product with a comparatively low melting point, and the needle-like flame of the high temperature, as above set down, must be directed in obedience to the tactic movements of a person of some skill. Cast-iron offers no such difficulties, because its melting point is considerably higher and the autogenous process is especially efficient in connection with cast iron, particularly if we take into account its non-ductile character. With whatever metals to be welded, it is a fact that thickness more or less defeats the operation. If the parts to be welded are quite thick, the edges will have to be backed off in order that the flame can actually contact with the mid-section surfaces, since it is true of autogenous process that the flame must contact with every particle of metal that is required to flow. The indirect application of heat, if the autogenous process is considered, would result in the flow of the metal that contacts with the flame and would destroy the shape of the parts without actually producing a weld, since the metal in the weld flame would receive its heat by conduction, which would not be enough to cause the metal to flow. The high temperature of the autogenous process is, therefore, efficient in proportion to the skill of the operator, and inefficiency will run rampant in the absence of skill.

VALUE OF NITROGEN IN THE MIXTURE

IT HAS been pointed out that nitrogen is present in the "mixture" in gasoline motors to a very considerable extent, and, too, tbat the nitrogen is inert, bence of no fuel value. The same authorities reach the conclusion that the absence of direct fuel value in the nitrogen is conclusive proof that the nitrogen is detrimental, in diverse ways, as fostering an obnoxious smell, decreasing thermal efficiency, and augmenting ignition troubles.

This is equal to saying a telegrapb poll is of no value because it does not directly transmit the electrical impulses, and it does attract lighting, which is somewhat discommoding in various ways. Remove nitrogen from the mixture and the same will take on the degrees of an explosive. There is a distinction to be drawn as between an explosive and a quick burning mixture, in which the rate of flame propagation is with a time factor that bears a manageable relation to the moving mass. This time factor is quite as necessary as the gasoline. The fuel value is desirable, but the means of its use cannot well be done away with, if good results are to follow. It is easy enough to so increase the rate of flame propagation, as to have the energy break out througb the cylinder walls instead of as a desirable manifestation.

The Minimum Sufficient Amount of Air Required.

It is generally considered that the minimum sufficient amount of air required with one pound of gasoline will be slightly more than 15 pounds, in which some 12 pounds of nitrogen will be found. It is conceded, however, that this rich mixture is not so very valuable because the motor heats up and the combustion is incomplete. Increasing the air content improves the mixture and raises the thermodynamic efficiency. On the other hand, tbis same increase in the quantity of air increases the quantity of nitrogen. Is it not strange that the results should be better if nitrogen is a detriment?

The products of combustion will be not less tban,

$CO_2 = 2$ pounds
$N = 11.8$ pounds
$H_2O = 1.5$ pounds
} for one pound of gasoline and 15.3 pounds of air.

The water and the carbon dioxide are products of fuel combustion, while the nitrogen, in itself, of no fuel value, absorbs heat on the peak of the heat wave and "fattens" the curve by giving up the excess heat. It does more by way of affording a measure of time to the flame propagation. The nitrogen then stands to the fuel, just as springs are to the chassis, or better yet, it is a "shock absorber." Without nitrogen the flame propagation would be on the basis of a detonator and the shock would be felt since the mechanism would not be free to absorb the same.

Whenever anyone wants to know positively as to the value of nitrogen in the mixture, they can readily have the negative answer by trying nitro-glycerine instead. Concentrated fuel is another name for a detonator, and it positively is not what is wanted in automobile work. The piston must either recede ere the pressure builds up or the cylinder walls will protest. The piston does recede, with the mixtures diluted with nitrogen, fast enougb to so influence the wave of pressure as to keep the same at a safe maximum.

Mixtures of Atmospheric Air and Hydrocarbons.

The present mixtures of atmospheric air and hydrocarbons tben has many advantages, among which safety is capitalized. The oxygen abstracted from the air is free to all and the nitrogen (shock absorber) is equally inexpensive.

When carbureters are properly adjusted and the fuel is nicely balanced the relation between the point of self-ignition and maximum pressure is about all that cast iron cylinders can be expected to stand. It is the nitrogen that makes it possible even as it is. If, on the other hand, the results are not all that cast iron can stand, it is the carbureter that is crying for attention and not a case of "too much Johnson" (nitrogen) as some are wont to claim.

Comparing gasoline with alcohol it has been pointed out that the nitrogen is in less presence, and the alcoholic mixtures are claimed to be superior because of this fact. Let us scan the scenery a bit, and see wbat the purturbances really are. It is the fuel that must be paid for by "coin of the realm," hence any comparison must be made on a basis of the fuel. It will be all right, for the present, to disregard the pound price, on the ground that alcohol has no market; nor will it have, until the relative values are equalized. Taking one pound of alcohol and the same amount of gasoline, it is to find that the fuel value for each may be measured in pounds of CO_2 and H_2O in the products of combustion, under equal conditions of service. These values may be set down as follows:

One pound of fuel and minimum necessary air.

Alcohol.	Gasoline.
$CO_2 = 1.9$	$CO_2 = 3$
$H_2O = 1.2$	$H_2O = 1.5$
Total $= 3.1$	Total $= 4.5$

and $$\frac{3.1}{4.5} = .688$$

In other words, the products of fuel combustion will be 68 per cent. of what will obtain witb gasoline, for alcohol, per pound of liquid fuel used.

Gasoline Is More Effective than Alcohol.

The volume of products considering gasoline will be more, and more nitrogen will be present in consequence, since the weight of liquid fuel is the same for both fuels considered. But, if there is more nitrogen with gasoline there is also more energy in the fuel to spend upon the nitrogen, and the result is not the disadvantage one might be led to understand. In gasoline, the ratio of potential products to inert products is as follows:

$$\frac{15.3}{4.5} = 3.4$$

while with alcohol the ratio, on the same basis, is

$$\frac{9}{3.1} = 2.9$$

In other words, there is 3.4 times as much inert gas in the gasoline as there is potential products, while in alcohol the value shrinks to 2.9. As a result of this exposé, it is to predict that the rate of flame propagation will be faster, somewhat, for alcohol than for gasoline. On the other hand, it does not necessarily follow that an advantage will be directly due to this fact, since it is true that efficiency is dependent, not only upon the heat energy in the fuel, but the ability of the mechanism to utilize that energy efficiently. There is much energy in a cyclone, but windmills do not seem to cope with it, efficiently. The same idea dominates the motor and the fuel.

Incomplete Scavanging Has the Same Effect as Nitrogen.

There is such a thing as going too far in the direction of retarding the rate of flame propagation, and spent products of combustion are likely to be the cause. On the other hand, if a motor is not well scavanged, this fact does not constitute a good reason for claiming that nitrogen is as a detriment. Certainly a motor must be well scavanged if it is to do good work, and the more completely the process is, the more will be the nitrogen requirement. In the advance of the industry it may be that concentrated fuel will be available. This will be when materials of construction will allow of higher pressures, and when the cost of such fuel will be low enough to compete with gasoline. The turbine, and oxygen from some cheap source of supply, to mix with the fuel, will be something to take notice of.

LETTERS INTERESTING AND INSTRUCTIVE

SOME LOSSES IN TRANSMISSION DISCUSSED.

Editor THE AUTOMOBILE:

[1,654.]—In connection with an electrical vehical I am overhauling, I want to reduce the electrical losses as much as possible, and would be glad to have you favor me with a formula, such as would serve to fix upon the right sizes of wires for the work. The normal rate of discharge is 20 amperes of current at 80 volts, E. M. F.

New York City. HYSTERESIS.

There are two considerations, i.e., (a) the wire must be big enough to abort undue heating, no matter what the "drop" in volts may be; (b) after determining the "drop" in volts by the formula here given, find out if the wire (conductors) will overheat; if so, reduce the "drop" in volts still further by making the size of wire of that area in circular mills, which will conduct the current in amperes without overheating. Formula:

$$m^2 = \frac{F A\ 21.21}{V} = F A Y = \text{area of conductor in circular mills (copper);}$$

$$F = \frac{m^2\ V}{F\ 21.21} = \frac{m^2}{A Y} = \text{the distance in feet (one way) from this source of supply to the delivery, counting the resistance of both the + and — leads;}$$

$$A = \frac{m^2 V}{F\ 21.21} = \frac{m^2}{F Y} = \text{current in amperes;}$$

$$Y = \frac{21.21}{V} = \text{a constant for copper;}$$

$$V = \frac{F A\ 21.21}{m^2} = \text{the "drop" in volts.}$$

A circular mill is equal to the square of a mill; one mill is equal to 1/1000 inch. Hence, the diameter in mills squared equals the area in circular mills. The heat question is a matter involving some uncertainty in view of the fact that the "emisivity" is dependent upon numerous considerations as, the diameter over the insulation; the degree of exposure to air currents; the color of the surface of the wire, and the insulation, etc. In general it is to say the energy in watts dissipated will be as follows:

$$W = \frac{1}{223} \times \text{degrees } F \times s = \text{energy in watts dissipated;}$$

whence:

$$I = \sqrt{\frac{W}{R}} = \text{the current in amperes;}$$

and;

$$R = \frac{10.3 \times L}{m^2} = \text{the resistance in ohms, of the wire, per foot of length.}$$

The allowable increase in temperature in degrees Fahrenheit may be fixed as 60 deg. Fahrenheit, and the emissivity may be taken (in work of this sort) as equal to that which satisfies the formula for "*W*." The surface in square inches can be taken as the surface over the insulation. In the formulæ, s = surface in square inches and L = length of wire taken, = 1 foot, = 12 inches, to find the surface in square inches, to use in the formula. In wiring a car it is well worth while to reduce the losses as much as possible.

FIAT "CYCLONE" AND CHADWICK BRIARCLIFF.

Editor THE AUTOMOBILE:

[1,655.]—Was the Chadwick entry in the Vanderbilt Cup race a stock car? Was the Chadwick recently tried out at Bristol a stock car? What is the size and type of engine used in the Fiat Cyclone?

St. Paul, Minn. L. O. G.

The Chadwick cars were regarded as stock models. The Fiat *Cyclone* is 140x130 millimeters, bore and stroke respectively, valves on the top of the cylinders.

FACILITIES FOR A RESERVE GASOLINE SUPPLY.

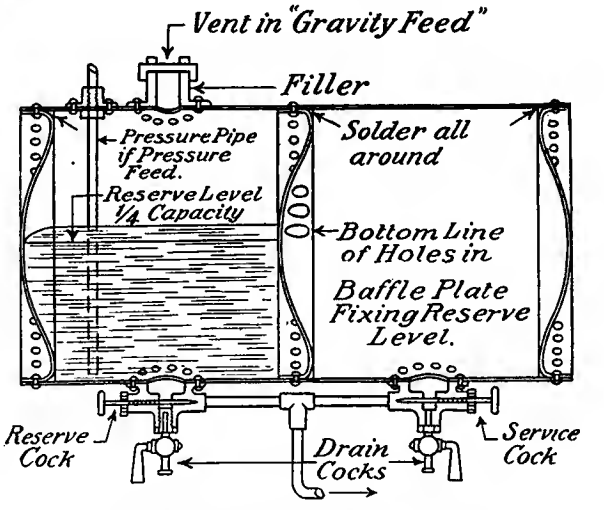
Editor THE AUTOMOBILE:

[1,656.]—I may be "an absent minded beggar," but the fact remains that I have, on more than one occasion, found myself without gasoline, at a distance from any possible source of replenishing the same. I dislike auxiliary tanks. How can I fix up a good scheme? P. A. B.

Nsw York City.

One way that might commend itself to you is here illustrated. The shell is of "20-ounce cornice copper." The heads, of 16-ounce, same material. The baffle plate is in the middle (of the same material as the heads), with holes to let the gasoline through above the horizontal center line.

This tank will hold in reserve one-quarter of the total capacity, which will be rendered at once available by opening the reserve cock. The service cock can be left open while the reserve is being used or it may be closed. In filling the tank, the filler is on the reserve side, so that the overflow goes to the service account.



Divided Gasoline Tank, Showing Reserve Supply.

If the gasoline is fed with pressure it must be observed that the pressure pipe is attached to the reserve side in order that the flame (if there is any) will be quenched in liquid fuel when the reserve fuel is all there is in the tank. It is assumed that the "pressure" will be led from the exhaust.

The "cocks" do not have to be in the "well" castings; they can be in the "make-up." The tank can be round, oval or any desired shape, suiting the space available in the car.

SOME TOURING CAR TIMING TROUBLE.

Editor THE AUTOMOBILE:

[1,657.]—I have a 1908 Reo touring car, Model A, and would like some information on timing the spark. My car has double-opposed engines, and the instructions say that the spark should fire on each cylinder at the same position on the flywheel. Now, I cannot get it to do this. The explosion will take place at the right place on one cylinder and on the other four inches late. Now, if you can give me the remedy, I will be greatly obliged.

I wish to ask you the cause of my exhaust pipes heating as they do. On coming home at night after a 14-mile run my exhaust and muffler will be red hot. H. B. ROBSON.

Anna, Miss.

The information afforded you in relation to the accuracy of timing, is beyond criticism. If you cannot locate the reason why the timing relation between the two cylinders resists your efforts, there is nothing for you to do but to call in the services

of someone who will locate the lost motion, or, difference in adjustment that is at the bottom of the undesirable result.

Exhaust pipes heat up because they are too small, unless it is that you are running on a retarded spark, or, using too much gasoline.

SOME VALVE SPRING TROUBLES DISCUSSED.

Editor THE AUTOMOBILE:

[1,668.]—I have had occasion to note that in some cars the valve springs seem to last as long as the car, while in other makes it is not uncommon to have to replace the springs at frequent intervals. Is it due to the quality of the steel, overwork, or what?

New York City. R. C. O.

Trouble could issue as a result of overwork, or, the quality of the springs might be at the bottom of some cases of failure. As a rule, it is to another circumstance that the "lazy" action will be traced.

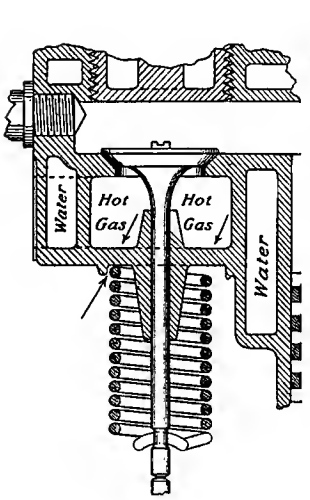


Fig. 1—Showing how the spring's temper is drawn by the heat.

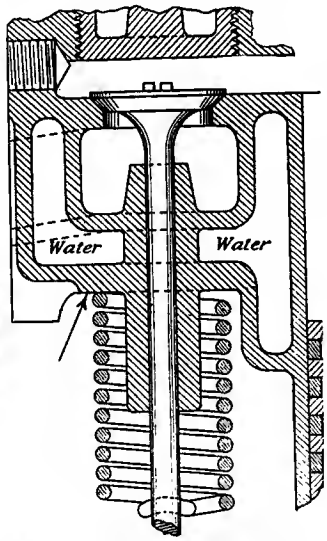


Fig. 2—Showing the spring protected from excess heat.

Fig. 1 shows a case in which this trouble would be eminent in view of the fact that the spring comes into intimate contact with the wall, on the other side of which the products of combustion are not separated by a water jacket.

Fig. 2 shows a better construction, in which the springs do not contact with "gas hot walls," it being the case that the water jacket intervenes. This is an example from one of the finest products with a high reputation for reliability, and the valve springs do not "wilt" if this idea is executed.

SPEED CHANGING BY TIMING DIFFERENTLY.

Editor THE AUTOMOBILE:

[1,659.]—From your recent articles on valve timing I do not get any clear idea of what possible changes I could adopt to make a car pull stronger on slow speed. I mean by this, of course, not changing the faces of the cams, simply by the meshing of the half-time gears. Would not a few remarks on this side of the subject be of interest to many readers? I have a car that has more speed than I care for on these roads, and I have been considering the purchase of a set of lower ratio final drive gears, but if it would be possible to set the valves to get more power at low speeds, it might be as well and cheaper. What influence might the change have on fuel consumption?

Let "Subscriber" (Letter No. 1, 601) look at his timing. It might be that one cylinder fires very much behind the others, which would make that cylinder very weak and jerky, but could not be so noticeable at higher speeds and lighter loads. KNOX.

Thomaston, Me.

It will not be inexpedient to try to change the gear ratio (effect) by so altering the timing as to make the motor go slower. Any change, such as this, will cause excess gasoline consumption, difficulty in starting and eccentricities in operation.

TEMPERATURE OF EBULITION OF LIQUID FUEL.

Editor THE AUTOMOBILE:

[1,660.]—Will you please insert this in "Letters Interesting and Instructive." I would like to know if any one has ever tried to generate gasoline into gas, for use in gasoline engines? If this can be done, would it not be better than the liquid in several ways? Perhaps you will say gasoline cannot be generated into gas without heating, which would be too dangerous and complicated and out of the question for use on an automobile. But I think it can. I have a device, which I have been testing for some time on a gasoline stove and it works fine. No liquid gets to the burner, nothing but the pure gas, very simple and perfectly safe, taking less than half the gasoline used for the ordinary stove for the same fire. Will soon test it on gasoline engines.

Would be pleased to hear from any one who has ever tried gas of any kind for engines and with what success. Will be glad to correspond with any one who is interested in this business.

Austin, Minn. F. E. KENDALL.

It is not uncommon to evolve gas (an explosive mixture) through the intermingling of gasoline with atmospheric air. The gasoline (hexane) when mixed with 15.3 pounds of atmospheric air, will become a homogenious gas at a constant temperature, and the 16.3 pounds of products of combustion will include 3 pounds of carbonic acid, 1 1-2 pounds of water and 11.8 pounds of nitrogen. In this combination you have the most complete combustion possible of attainment by any method whatsoever, and it takes into account the vaporization of the gasoline. You cannot accomplish more by any process, and the builders of gasoline automobiles are striving for this perfection.

WOULD TELEPHONE MAGNETO SERVE?

Editor THE AUTOMOBILE:

[1,661.]—Would you please tell me in your "Letters Interesting and Instructive" if an alternating current magneto, such as was used with the old-fashioned telephone bell, could be made to give, through an induction coil, sufficient spark for automobile use? Also, why is an alternating current magneto used with a vibrator coil? Why can't it be used with a step-up transformer, and thus get rid of the vibrator? L. C.

Brookline, Mass.

Very likely, it depends upon the windings on the armature of the magneto and the strength of the magnetic field. The magneto might be a little weak and better results would follow a more pretentious magneto, especially designed for the work.

Transformers are used in connection with magnetos, as you suggest.

TO CHANGE DEGREES FAHRENHEIT TO CELSIUS.

Editor THE AUTOMOBILE:

[1,662.]—What is the relation of Fahrenheit to Celsius degrees?

New York City. P. S.

$$\text{Celsius} = \frac{(\text{Fahrenheit degrees} - 32)\ 5}{9}$$

INFLUENCE OF INFLATING GASES ON RUBBER.

Editor THE AUTOMOBILE:

[1,663.]—Upon receipt of a communication from Philip A. O'Neil, of 1020 Bedford avenue, New York City, in relation to the effect of tire inflating gases upon the rubber of the tires, and in view of the fact that Mr. O'Neil complained of the rapidity with which the tires deflated, the matter was taken up and investigated at some length. The investigation included the opinions of numerous of the tire makers and the result can be stated in no better language than that of one of them:

"Carbon dioxide is absolutely not injurious to rubber, and in that respect is slightly superior to ordinary air, which, in the absence of direct light, oxidizes rubber very, very slowly. For inflating purposes air is entirely satisfactory, since its rate of oxidation is so low as to be practically negligible except in the presence of direct light. Obviously the latter condition is not to be feared from any inflating medium. Carbon dioxide appears to be open to the objection that it diffuses more rapidly through rubber than air, and for that reason tires inflated with carbon dioxide must be inflated more frequently. We would not anticipate any difficulty whatever in satisfactorily carrying either air or carbon dioxide in pressure tanks and we certainly would not expect a formation of any nitric oxide or anything else which would injure either the rubber or the valves." THOS. J. FAY.

Brooklyn, N. Y.

Model XXX, the Four-Cylinder Stevens-Duryea for 1909.

BEGINNING in 1891, the Stevens-Duryea Company, of Chicopee Falls, Mass., introduced a pioneer automobile and from that day to this they have been building automobiles, advancing as their knowledge permitted, until to-day the Stevens-Duryea product is of world-wide fame. Instead of a hide-bound policy the Stevens-Duryea Company made such revisions from time to time as the exigencies of service indicated, and when they found that increasing the number of cylinders promised to them, more than increasing the diameter of a less number of cylinders, they took up the trail and blazoned the way that ultimately resulted in the six-cylinder motor, the flexibility of which is only equaled by the continuity of its overlapping torque. That they pursued a sane course, bounded by a certain conservatism, is evinced from the fact that the Stevens-Duryea product includes a six-cylinder car for the class of work demanding the same and a four-cylinder car in the specialized service for which the four is noted.

In this description, portraying the more recent products of the Stevens-Duryea Company, intending to include the Model XXX, four-cylinder motor, and the Model Y, six-cylinder motor, it will be possible to advance the discussion along common lines to a certain extent, because of the consistent practice of the designers in this case, who seem to hold to the impression that the three-point suspension, for instance, is good in connection with each of the models, if it is good in any case, as it certainly proved to be.

Utility of the Three-Point Suspension.—In connection with both of the power plants here to be discussed, the motor, clutch, and transmission are all within the confines of a common cylindrical case, the material of which is aluminum alloy, which case is suspended from two arms at the front end, and is supported on a rocker at the rear end. In this fashion the contortions of the chassis, following the interception of road inequalities, are not transmitted and taken up by the individual members of the power plant, for the simple reason that a unit suspended from three points only is incapable of participating in the transmission of moments of whatever character, if the moments, so called, are the product of outside potential forces. It is the claim of the makers in this case that the principle here enunciated is such as to preclude a chance of the disalignment of bearings, or the introduction of bending moments into the crankshaft, the clutch-spindle, or driving shaft, or, such other parts as make up the "train" in the trasmission of the motive power. By rendering the whole power plant, including its transmission devices as a single unit, they not only thwart outside influences but in the machining process means are afforded by which the alignment of the bearings is assured, and the mechanism *in toto* is protected as against forcign substances, while oiling becomes a simple matter. In this way the life of cars will be prolonged the greatest possible length of time.

Accessories Common to Both Types of Motors.—Admitting that there will be differences in point of linear dimensions as dictated by the ratings of the two types of motors, it is a fact, nevertheless, that in a broad sense this description will lose no force if it continues along lines common to both. Considering the ignition, for instance, it is to note that two independent systems of ignition are employed, comprising the Bosch high-tension magneto and a multiple coil. The gasoline system in connection with both models consists essentially of a new type of single-jet, float-feed carbureter in combination with a well placed piping system, and an adequate gasoline tank. The control takes into account both spark and throttle with levers and sectors on the steering wheels, so arranged, however, that the control levers do not rotate with the steering wheels. An auxiliary foot accelerator connects with the throttle in each case. Likewise the cooling system is by means of a cellular radiator, centrifugal pump, and belt-driven fan, in which the belt is wide and driven from the flywheel. The intake and exhaust manifolds, the piping and incidentals are equally worked out for the respective models, and the oiling, which is probably one of the most important accessories, is by means of a force-feed oiler located under the hood

Model Y, the Exponent of the Six-Cylinder Stevens-Duryea Idea.

and connected to lubricate the engine in each case. The steering gear, cardan shaft, and differentials are packed in grease, while the transmission gears run in oil, and the transmission bearings receive their supply from the splash.

Features of Clutch and Transmission.—The differences between the clutch and transmission in the two models here under discussion are of size and not of material or the principals involved. The clutches used are a "patented" multiple disc type, consisting of two sets of steel discs, one set being faced with asbestos; no oil is used. The transmission gear in each case provides three speeds and reverse, and an automatic position finder for the shifter. The drive is through bevel gears and direct on the high. From the bevel drive, the transmission passes through floating type rear axles, actuating wheels of the artillery type, the hubs of which are drop-forgings of an appropriate grade of steel. The woodwork in the wheels is of a high order, the design of which is such as to lend strength.

Chassis, Springs, Brakes and Detail.—In both models, the chassis frame is of chrome nickel steel, of correct design, and channel section. The latterals are suitably spaced, properly secured, and the fittings are of fine grades of material and securely fastened in such a way as to distribute the stresses. In both cases the chassis frames are suspended on semi-elliptical springs, excepting that for the Model Y there is a third semi-elliptical cross-member. In the Model XXX the front springs are 36 inches long, and the rear springs are 56 inches long. While in the Model Y the front springs are 36 inches long and the rear semi-elliptical springs are 48 inches long with a cross-spring 36 1-2 inches long. The spring shackles and other details of the spring suspension are of a high order of merit. Coming down to the brakes, it is to say there are two sets on the rear hubs, considering both types of cars. The external sets are contracting brakes, asbestos to metal, operated by foot levers. The internal sets are expanding brakes, metal to metal, operated by an emergency lever. In each case the brakes are extra wide of face and liberal for the work to be done.

Model XXX Power Plant.—The motor is with four cylinders, 4 3-4 by 4 1-2 inches, bore and stroke, respectively; they are cast in pairs with water jackets integral. Inlet and exhaust valves are located on the same side of the cylinders and are operated by one camshaft. The mounting is such that a clearance of 11 3-4 inches obtains for the flywheel, and the power of the motor is such that the speed of the car ranges between 50 and 55 miles per hour, depending upon the number of passengers in the car, it being the case that the Model XXX is equipped with a three-passenger body, and the lower speed mentioned will obtain if three passengers are seated. With a view to the utilization of the power available in such a way as to engender nice conditions of road performance, the wheelbase is 109 inches, with 56 inches tread, and the tires are 36 by 3 1-2 inches front and 36 by 4 inches rear. The center of gravity was given its due measure of attention, and considering a safe ground clearance as dictated by American roads, the machinery is set as low down as possible.

Model Y Power Plant.—The six-cylinder motor, 4 3-4 by 4 1-2 inches, bore and stroke, respectively, with water-cooled cylinders cast in pairs, jackets integral, in which the exhaust valves are located on the same side, operated by single camshafts, furnishes the power. If the unit power plant is desirable in general, it is particularly valuable in connection with this power plant, in which as a matter of necessity the overall length is something to take into account. In this plant the clearance under the flywheel is 12 inches, and 16 inches under the crank case. The least clearance is under the rear axle, which is 10 1-4 inches, while the clearance under the front axle is 12 inches. To consider the power plant without taking into account the relation it bears to the car as a whole would be to ignore not only important, but the essential of relations. In this case the wheelbase is 142 inches, the tread 56 inches, with 36 by 4-inch tires in front and 36 by 5-inch tires for the driving wheels. For a seven-passenger car, considering the power of the motor, and all the other conditions found in this product, the relation of the power to the chassis can be regarded in a very favorable light.

Commercial Considerations in Relation to Both Models.—In the Model XXX car, the equipment consists of lamps and a gas generator. The price is $2,850. In the Model Y car the equipment consists of full lamps and gas tank, while the price is $4,000. From the point of view of purchaser of automobiles in considering the price, it will not be out of place to take into account the presence of annular ball bearings throughout, excepting in the engines in each case, the absolutely standard body construction, the perfect carriage finish, rich upholstery, commodious space, and the period of years through which this product has evoluted.

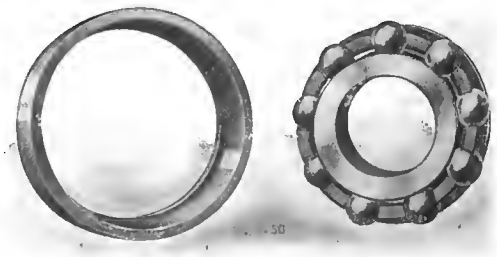
Finally, in relation to the respective models, it is to say the Model XXX car has a standard finish comprising English purple, lake body and frame, with primrose yellow for the running gear, but any special color will be provided at an additional cost of $50. The weight of this car complete is 2,400 pounds. For the Model Y the body is in English purple lake, the chassis in carmine, stripped, but it will be optional with the purchaser to select brewster green for the body and chassis, or any special color at the extra cost of $50. This car weighs 3,400 pounds.

A NEW MAGNETO BALL BEARING.

Thoroughly tested by a season's practical use, the Hess-Bright Manufacturing Company, of Philadelphia, as well the German DWF at Berlin, and the French DWF at Paris, are now offering for general use a new magneto bearing, which follows in the main the general annular type of which this company was the

Cross-section New Hess-Bright Magneto Bearing.

originator. The inner race is grooved in the usual way, but the outer race is grooved at one side only. The balls are held in a special short steel retainer. A dismembered group of the three elements, inner race, ball retainer with balls, and the outer race, is clearly shown in the illustration, as is a cross section of the



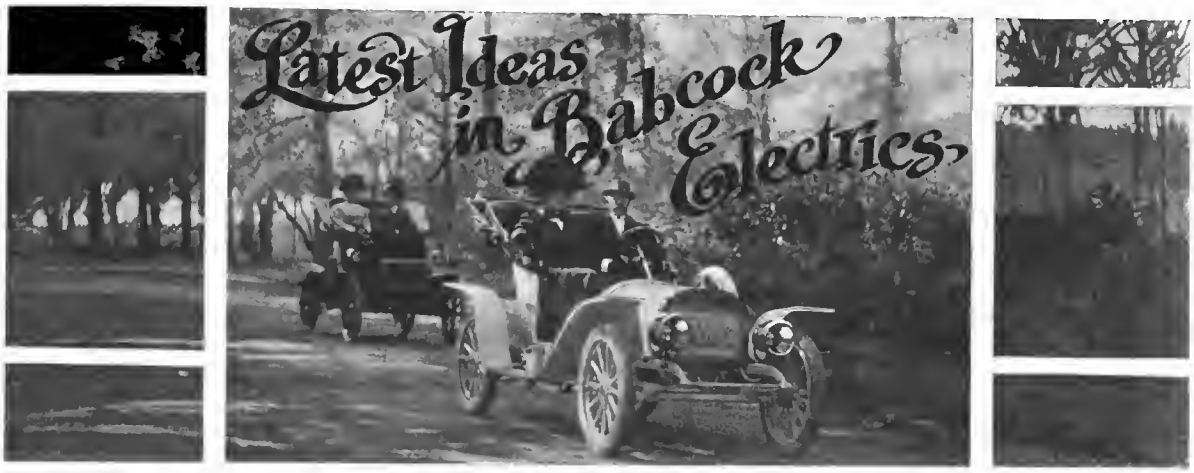
Group Showing Inner and Outer Races, Retainer and Balls.

bearing. At the present time three sizes are being regularly furnished, of the following dimensions:

	Bore.		Diameter.		Width.	
	MM.	Inches.	MM.	Inches.	MM.	Inches.
7882.....	10	.39370	28	1.10236	8	.31496
7802.....	15	.59055	35	1.37795	8	.31496
7778.....	17	.66929	44	1.73228	11	.43307

Other sizes are furnished on special demand, and will be added to the stock sizes as the demand indicates the advisability of carrying them.

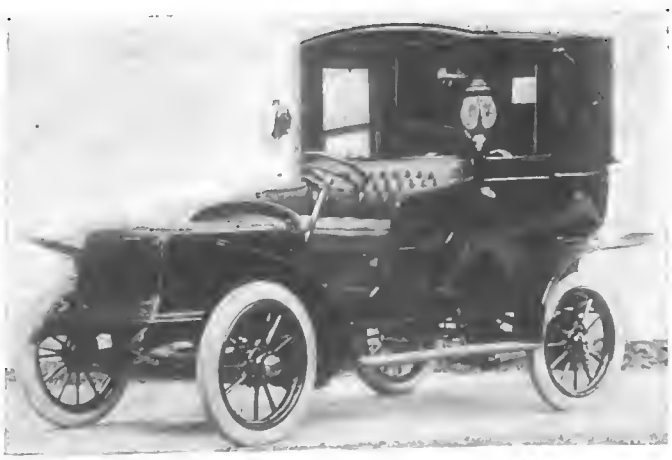
City of Mexico, Mex.—The Mexico City Cab and Omnibus Company has in operation on the streets of this city five automobile omnibuses and has placed orders for ten more. The 'buses are built on 35-horsepower Panhard chassis and are 25 feet long; they seat 30 passengers.



F. A. Babcock in the New Babcock Electric Roadster.

BUFFALO, Nov. 30.—"If you are going to try to imitate the lines of the gasoline car, why not go the whole thing and make a complete job of it while you are about it?" said F. A. Babcock, of the Babcock Electric Carriage Company, when speaking of the new model electric roadster which his company will feature for the coming season. And the result, as shown by the car itself, which is depicted in the accompanying photograph, indicates that the builder has had the courage of his convictions in this respect and has left nothing undone to perfect the deception. This likewise holds true where other essentials are concerned as well, for considering the legitimate field of the electric to be town work, the designer has installed the control on the left-hand side, despite the prevailing fashion, though the adoption of this feature by some of the taxicab builders strongly indicates that the necessities of the case will shortly rule supreme where this essential is concerned.

Starting with the armored wood frame, that has always been a characteristic feature of Babcock construction, it is easy to trace the same trend of design that has become familiar on these vehicles during the past several seasons, and which has doubtless been responsible for their continued success. The "power-plant" consists of 42 cells of the special Babcock battery, equally divided between the space under the hood and that under the rear deck, and a single motor rigidly attached to special supports directly under the footboard, or exactly in the center of the car, thus making for an ideal distribution of the weight. This motor is also a special Babcock design and is built to the specifications of the company by one of the large makers of electrical apparatus. By means of a Morse silent type of chain, it drives to a countershaft, from which the final drive to the rear wheels is taken through the usual standard type of double chain drive. Both front and rear axles are of tubular construction, thus giving lightness with strength, the wheelbase being 92 inches and the tread slightly narrower than the standard, or 52 inches. Flat semi-elliptic springs are used for suspension all round, thus carrying out prevailing gasoline car practice in this respect. The tire equipment consists of 32 by 3 1-2-inch pneumatics on all four wheels, a special electric type of tire being employed.



The New Babcock Electric Town Car or Taxicab.

One of the chief features of interest about the Babcock roadster, although it is an item of construction that applies to all the Babcock cars, is the special pedal control. The usual controller, giving five forward speeds and two reverse, is located beneath the foot board where it is readily accessible for inspection, and is operated by means of the small side lever ordinarily employed for this purpose. But in addition to this, there is a pedal by means of which the speed of the car may be controlled at will without disturbing the side lever, this making for a close approach to the method of clutch control usual on the gas car, in addition to simulating the appearance of the latter, in the case of the Babcock gentleman's roadster.

This pedal operates a graduated switch acting through a resistance and permits of the use of several steps in the supply of current to the motor, as limited by the position of the side lever. If the latter happens to be set for full speed ahead, the pace of the car may then be controlled from a stop to full speed, merely by using the pedal; if set at the third speed forward, then the pedal switch handles the amount of current that this position of the lever provides from the batteries, acting in the same manner with regard to any one of the lever positions, whether for forward or reverse speeds, a feature that is of great help in handling the car in heavy traffic, as the control may be by the two pedals alone, the foot switch and the brake, leaving the hands entirely free for the wheel.

The Babcock gentleman's roadster is geared for a maximum speed of 32 miles an hour, and under favorable conditions is good for 100 miles on a single charge of the battery, at an average speed of 17 to 18 miles an hour. Unlike its compeers in the gasoline field, its rumble will face aft, a special footboard being provided for the comfort of the occupant of that seat, whose view will accordingly not be confined to a vista of the rear of the top. Another new model that will be featured by the Babcock company for the coming season is a town car, which will also

be available for taxicab service, and in view of the experience that some companies have been undergoing in the shape of an excessive percentage of equipment constantly in the shop due to mechanical troubles, interest in electrics is again awakening.

The Babcock town car is also equipped with a 42-cell battery of 15-plates each, the weight being distributed in a similar manner, though where its control is concerned a departure has been made by substituting a second wheel just beneath the steering wheel for the side lever control, so that with the special pedal switch already described, the driver is never under the necessity of removing his hands from the steering wheel. The tire equipment in this case consists of 32 by 4 1-2-inch pneumatics all round. A feature that is employed on all Babcock cars is the safety switch which prevents tampering with the car when left standing at the curb. This consists of a Yale lock operated in the usual manner, but so connected up that unless the switch has been unlocked prior to inserting the starting plug, the use of the latter causes the usual warning bell to start ringing, which continues as long as the plug is left in with the lock in this condition.

The past season has proved an unusually profitable one for the Babcock factory and the Buffalo plant, which probably comes nearer to turning out a complete electric vehicle under its own roof than any other in the country, has been working to its full capacity for some time past with the prospect that this will be the case throughout the coming season. The demand from the Far West has been particularly encouraging and Salesmanager Pearly of the Babcock forces, who is now in Southern California, will devote his entire energies during the next two or three months to looking after the details of the business on the Pacific Coast. In that time, he will have an opportunity to make a thorough canvass of the field where the outlet for electric vehicles is concerned, and before returning East, he will organize the Babcock selling forces in that territory in accordance with the result of his investigations. Following this, agencies in other centers, such as Chicago, where quite a number of Babcock cars have been sold during the past season, will come in for attention, Mr. Pearly believing that 1909 is going to prove a banner year for the electric as well as for other classes of cars.

SOME RECENT RECORD-BREAKING AT BROOKLANDS

LONDON, Nov. 10.—Although the Brooklands season has come to an end as far as the public meetings are concerned, attempts at record are still the order of the day. Perhaps the most interesting of all was the performance of the little six-horsepower Sizaire-Naudin voiturette—the particular car which won the Coupe des Voiturettes last September.

In spite of the wind and rain of Wednesday, November 4, M. Naudin, accompanied by M. Sizaire, decided to make the attempt. From a flying start the first half mile was covered at a rate of 66 1-2 miles an hour, and, keeping up its speed with great regularity, the curious looking blue car passed the 50-mile mark in 45 minutes 54 seconds—an average of 65 1-2 miles an hour. In the hour 65 1-2 miles were covered, and finally the full hundred miles were completed in 1 hour 31 minutes 54 seconds, equal to 65 1-4 miles per hour. The bore of the single cylinder was officially measured up to be 3.93 inches, while the length of stroke is said to be 8.8 inches, or possibly even more.

A new name has been added to the record list by the performance of one of the Grand Prix Brasiers, driven by Bablot. This car just comes within the 60-horsepower classification and, as was anticipated, it made short work of the existing figures, which represented a speed average of just over 85 miles an hour. The flying half-mile was covered by the Brasier at 108 1-2 miles per hour, and the ten laps, which, taken from a standing start, constitute the second standard distance, showed an average of 101 3-4 miles for the 27 miles.

A second monster which helped to make this a day of note was the Napier *Sampson*—memorable from its contest with Nazarro's red *Mephistopheles*. Driven by Newton, the car raised the 90-horsepower half-mile record to an average of 114 3-4 miles per hour—somewhere near the limit of Brooklands' speed possibilities. The ten laps were soon reeled off at 102 1-4 miles per hour, but while this is a record, it is somewhat disappointing when compared with the Brasier speed.

Motorcyclists have not shown much interest in the track hitherto, but a fortnight ago C. Collier established a new world's record. Riding a seven-horsepower twin-cylinder Matchless machine of his own make, Collier covered 70 1-8 miles in the hour, easily passing the previous record of 63 miles set up by Guippone at Paris as far back as 1905.

THE AUTOMOBILE CALENDAR

AMERICAN.

Shows and Meetings.

Dec. 31-Jan. 7..—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reeves, General Manager, 29 West 42d St.

Jan. 5.....—New York City, Fourth Annual Meeting Society of Automobile Engineers. (Will adjourn until January 19 after opening session.)

Jan. 16-23.....—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. M. L. Downs, Secretary, 7 West 42d St., New York City.

Jan. 25-30.....—Detroit, Light Guard Armory. Seventh Annual Automobile Show, Tri-State Automobile Dealers' Association.

Jan. 27-Feb. 3..—Philadelphia, Second Regiment Armory, Eighth Annual Show, Philadelphia Automobile Trade Association.

Feb. 6-13.....—Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. S. A. Miles, Manager, 7 East 42d St., New York.

Feb. 15-20.....—St. Louis, Mo., Annual Show, St. Louis Dealers and Manufacturing Association.

Feb. 15-20.....—Detroit, Wayne Pavilion, Annual Show, Detroit Automobile Dealers' Association.

Feb. 15-20.....—Cleveland, First Regiment Armory, Annual Show, Cleveland Automobile Dealers' Company.

Mar. 6-13.....—Boston, Mechanics' Building, Seventh Annual Automobile Show, Boston Automobile Dealers' Association. Chester I. Campbell, Manager, 5 Park Square.

Mar. 27-Apr. 3..—Pittsburg, Duquesne Garden, Automobile Show, Pittsburg Automobile Dealers' Association.

Races, Hill-Climbs, Etc.

Dec. 8.....—Worcester, Mass., 200-Mile Endurance Run of the Worcester Automobile Club.

Jan. 1-2.....—Philadelphia, Two-day New Year's Run of the Quaker City Motor Club.

FOREIGN.

Shows.

Nov. 28-Dec. 13.—Paris, Eleventh Annual Salon de l'Automobile, Grand Palais, Automobile Club of France (Pleasure Vehicles, etc.).

Dec. 20-28.....—London, Stanley Show, Agricultural Hall.

Dec. 22-29.....—Paris, Eleventh Annual Salon de l'Automobile. (Commercial Vehicles, etc.)

RAPID INCREASE OF AEROPLANES IN FRANCE

PARIS, Nov. 30.—It is not generally realized, even in France, to what an extent the aeroplane movement has already grown. On a moderate estimate there are under construction in Paris and its immediate neighborhood not less than 350 aeroplanes. The public hears little of them, for in most cases they are experimental machines, that the designer prefers to try out in peace before bringing before the attention of tbe world. There are fifty orders in hand for the Wright aeroplane, which will be in the hands of well-known sportsmen next season; in addition to this, such shops as those of Voisin, Antoinettc, Astra, etc., are busy on machines for French sportsmen. Many men, as, for instance, Louis Bleriot and Melvyn Vaniman, the engineer of the Wellman balloon expedition build quietly in their own shops, and it is not until the machine is brought out for flights that the public wakes up to the fact that something has been doing.

It is not surprising that there is so much activity when there is in Europe alone a sum of about $250,000 awaiting to be won for aeroplane performances. Experienced men, however, are lacking, for most of those building or buying machines are new to the game, and when they get their apparatus are unable to fly with it. To overcome this, one of the largest firms of aeroplane constructors is about to open a practical aeroplane school, in which they will be more concerned about teaching the practical handling of an aeroplane than the theories regarding its operation. Leon Delagrange, too, has turned teacher, and is prepared to show anyone how to fly on an aeroplane for the sum of $200. At the Auvours camp Wright is now completing the education of his three pupils, one of whom has already flown alone, and these three men, as soon as competent, will be used to teach the art to others.

Preparations to Build a Number of Wright Aeroplanes.

It is declared that next year the Chanticrs Navales de France will undertake the building of Wright aeroplanes in large series for the French committee. Already an order has been given a French firm for a large series of motors on similar models to the one used by Wilbur Wright. The first order given was for an exact duplicate of the Wright engine. The constructors objected that the motor was defective in several respects and asked to be allowed to make detail modifications. Wilbur Wright refused to listen to them, and the exact duplicate order was maintained. While working according to instructions, however, the firm built an improved engine, on the same general lines, but remedying the many small mistakes in the one used in America and Europe. On a test being made the improved motor was found to give so much more power that Wright was immediately convinced that he was mistaken, and accepted the changes. It is declared that the engine used for the most successful flights in Fracne barely develops 25 horsepower, which is a remarkable tribute to the efficiency of the aeroplane, for there are scores of machines with four timcs this power which fail to leave the ground.

Specially Designed Aeroplane to Cross English Channel.

One of the first machines specially built to cross the Channel from France to England is now nearing completion in the Voisin Frères shops. It is a monoplane ordered by Prince Bolatoff, a young Russian sportsman, who will equip it with a special light weight Panhard engine of 100 horsepower. It is practically certain that an attempt will be made during the early months of 1909 to cover thc twenty miles separating France from England, for apart from the various sportsmen who are desirous of accomplishing the task there are half a dozen firms of builders who would give much to have this powerful means of publicity. It is recognized that the sensational flight is not difficult on condition that an engine can be obtained which can be relied upon to run the necessary length of time without a falter. Up to the present it is the engine that is giving the greatest amount of trouble, few light weight engines being capable of running long without developing weaknesscs dangcrous to the aviator.

Practical Men's Opinions on the Types of the Future.

Generally European aeronauts are of the opinion that the flying machine will develop on sporting lines, in the same way as was done by the automobile, but that, owing to the more fascinating naturc of aerial navigation, it will have a greater success than the automobile, and less importance from a commercial standpoint.

Wilbur Wright is not of this opinion, and in a recent conversation with THE AUTOMOBILE correspondent declared:

"The flying machine is a military proposition. It will naturally attract a certain amount of attention as a sport, but its greatest future is for use with armies. I believe that owing to the intensely fascinating nature of flying a number of sportsmen will become interested in the flying machine, but their number will not be so great as to have any serious influence on the automobile. I have always been of the opinion that the future of the flying machine was in army work, where it will largely take the place of cavalry, and where it will be an instrument with which the enemy can be constantly harassed. In the immediate future hundreds of these machines will be attached to every regiment. As a commercial proposition there is little future for the aeroplane, for it can never compete with railroads and steamships.

"There is naturally a certain amount of danger with a flying machine, but it need not be any greater than on an automobile, and in my opinion it is more risky to be on the Paris streets than aloft. With my machine there is no danger from a passenger moving; as a matter of fact, I could sit on the tip of the wing and still balance the machine.

"Though of course it is useless to carry unnecessary weight, there is nothing to be gained by the search for extra light motors. Even if the gasoline engine had not come to the fore when we made our early experiments, it would have been possible to fly with a steam engine. To-day there are plenty of automobile engines that we could lift off a car, place on our aeroplane and fly without any change whatever. The aeroplane of the future will be fitted with an automobile engine with a little of the superfluous weight removed."

Asked whether he had succeeded in his experiments up to his expectations, Wilbur Wright declared:

"When we began work we believed that it would be 50 years before man would be able to fly; two years later my brother and I had flown together. It is impossible to say what is the greatest difficulty, for there are a thousand problems in one, and as soon as you settle one difficulty you are on the heels of another."

"During the next five years," declared Henry Farman, "pleasure flights will become exceedingly common, especially around all holiday resorts. There will be no attempt for a long time yet to fly over towns, or over mountain ranges, for journeys with two or three passengers and for distances up to 200 miles the aeroplane is the coming mode of locomotion. Trips across the English Channel are not likely to be undertaken just yet, for although greater distances than this have been covered. there is so much risk that the journey is not worth attempting. By reason of its development as a sport, the aeroplane is bound to have a very serious influence on the automobile. Certainly long-distance touring witb costly, high-powered cars will fall off in popularity at a very early date."

M. Levavasseur, designer of the Antoinette light-weight engine and builder of numcrous successful aeroplanes, has an entirely different vicw of the future of the flying machine.

"In five years there will be a new industry, which will be more important than the automobile industry at present. In this period the aeroplane will have reached its maximum of develop-

ment, and large passenger carrying machines will be common. The future is entirely with the large aeroplane; we are making a mistake at present by building light and small. Large machines will be much more successful than small ones; an eagle can fly in a gale, while butterflies and all small birds are obliged to seek shelter. Next year we shall have an eight-passenger aeroplane driven by a 200-horsepower engine, capable of traveling over 100 miles an hour. The success of the aeroplane is assured as a sporting proposition, and by reason of its success will cause the abandonment of the automobile."

Comte de la Vaulx, long-distance balloon champion: "It is along sporting lines that the aeroplane will be developed during the next five years. There is very little future for it from a military standpoint and practically none in the commercial field. Already the aeroplane is too fast to be of any use for military reconnaissance, the speed at which it travels making it impossible for any officer to obtain accurate information on the doings of the enemy. Its inability to go out in all weathers makes it impossible commercially, at any rate for the present."

Ernest Archdeacon, part donator of the Deutsch-Archdeacon $100,000 prize: "The two most important problems to be solved by the aeroplane are some means of starting without an initial run over the ground, and the provision for passengers. The successful aeroplane of the future will be the one that unites these two qualities, and has in addition the minimum displacement for the maximum bearing capacity. At present constructors persist in copying the bird, thus producing a machine of very great area and only handled with ease in open spaces. It is a mistake to follow nature, and the future aeroplane, in my opinion, will be not one large bird but several small birds joined together."

BELIEVE RACING AUTO WILL GIVE WAY TO AEROPLANE

PARIS, Nov. 289.—There had been a short, sharp skirmish for the control of aerial navigation in France, with the result that what at one time looked like a war for supremacy has been avoided by a satisfactory settlement. As it became daily more and more apparent that the aeroplane will attract an enormous amount of attention as a sport and industry, the Automobile Club of France decided to interest itself and get such a hold of the sport that it would in time control it as it now controls the automobile. The Aero Club of France, which has struggled with spherical balloons, dirigibles, and now seems likely to be important as the result of the arrival of the aeroplane, frowned upon this intrusion. The League Nationale Aerienne, a patriotic body which dreams of giving France the top notch in all matters of the air, also became jealous.

Finally a gathering of all three parties was arranged, with the result that it was decided to appoint a joint commission from all three bodies with sole power to draw up rules governing aerial competitions and generally govern the sport of flying. Each of the three bodies is left free to do its own work, and while the League and the Aero Club will continue as before, the Automobile Club will branch out in a series of experiments, competitions, and demonstrations for the flying machine.

Though an agreement has been arrived at, it is easy to see that there will be rivalry between the Aero and the Automobile clubs, for the latter realizes that as a sporting proposition the automobile will have to give place to the aeroplane at no distant date. It will be manifestly impossible to get crowds to watch automobiles run over roads at 70 miles an hour when aeroplanes can be seen traveling through the air at 100 miles an hour. Thus the one who secures hold of the aeroplane industry and sport has a permanent and profitable position.

All the various commissions of which the Automobile Club of France is composed, will in future occupy themselves with aeronautics. Already it is announced that the club committee has made arrangements for the purchase of an aerodome in the neighborhood of Paris, to be used as a training ground for its members, a place where new machines can be tried out, and for competitions. The touring commission has begun to get busy on two maps for aerial navigators, showing air line distances from one town to another in France. Later it is the intention of the committee to have fixed up over every village and town large distinctive signs composed of a group of letters of the alphabet and numbers, corresponding with similar groups marked on the map. The aeroplanist flying across country will read off the sign, turn up a list supplied with his map, and thus locate his position. Another idea is to arrange for electric searchlights at the outskirts of towns to serve towards aviators just the same as lighthouses now aid sailors.

It is declared that the technical committee will undertake serious work in the direction of organizing competitions and making researches in the direction of the most suitable motors for aeroplane work. It is generally admitted by aeronauts that as soon as a thoroughly reliable aeroplane motor is produced the aeroplane will make immense progress.

An indication of the serious manner in which the club is taking up the aeroplane question is shown by the fact that a very large portion of the industrial Salon, to open in Paris, December 24, is devoted to flying machines.

Indications are that there will be aeroplane races near Angers in connection with the Automobile Grand Prix next June or July. The local committee has taken up the matter and is anxious to hold a race from Angers to Saumur and return, distance about 60 miles. The prizes are a challenge cup, to be held for one year by the winning club, and a large sum in cash for the pilot of the successful machine. Much interest will result in this way and profit in the long run.

WILBUR WRIGHT'S WINNING OF FRENCH HEIGHT PRIZE

PARIS, Nov. 28.—Wilbur Wright's winning of the height prize of the Aero Club of France is likely to cost that body dearer than they expected. Farman made a try for the prize a few days ago, fulfilled all the conditions, but was not awarded the money on account of a technical objection. Farman protested, and has since been awarded the prize; but in the meantime Wright has flown to the necessary beigbt and is without doubt entitled to tbe prize also. The only solution is to double the prize, giving one to each aviator.

Wilbur Wright won the prize under difficult conditions, the regulations stipulating that he must start off under his own power. The American aeronaut refused to abandon his skates for wheels, but started from his wooden rail without the use of the falling weights. Before going away for the high fly be touched ground at two points indicated to the committee in advance, then, without stopping his engine, went up aloft. The line of small balloons 82 feet above the ground, was passed with a margin of about thirty feet, and a few seconds later the flyer was at its starting point.

A flight with Captain Girardville followed, and had been under way for about twenty minutes when, at a height of 15 to 20 feet from the ground, the chain driving the right-hand propeller suddenly snapped. Feeling that something had gone wrong, Wilbur Wright put up his hand and cut out the ignition, bringing the aeroplane to earth gently after describing a circle in descending. An hour later flights were resumed.

An Improved Roadway on Long Island that Intersects the Picturesque Northern Coast.

NEW ENGLAND GOVERNORS ON ROADS AND AUTOS

BOSTON, Nov. 30.—The conference of Governors, other officials, and prominent citizens of the six New England States on the conservation of the resources of this section of the country and uniform legislation, closed last Tuesday afternoon with a session devoted to highways and automobile laws. At the previous meetings forestry, fruit cultivation, and fisheries were considered, but the highway and automobile questions attracted the largest attendance in Tremont theater. There were three speakers on the general topic of "Highways and Their Use." These were Chairman Harold Parker, of the Massachusetts Highway Commission; Highway Commissioner James H. McDonald of Connecticut, president of the American Roadmakers' Association, and former Governor Nahum J. Bachelder of New Hampshire, master of the National Grange.

Commissioner Parker's sub-topic was "The Construction of Highways" and he told of the growth of the highway system in this country, how it first was started to connect centers, then was neglected for waterways and later for railroads, and how it has now again come to the front. The State of Massachusetts, he said, was one of the first to consider seriously the question of building its roads under the authority of trained men. The Legislature established the Highway Commission which has been in existence for fifteen years. In that time it has built nearly 800 miles of thoroughly well devised stone or gravel roads. It has taken charge of the construction of several hundred miles of town highways which have been built under its direction and supervision, hut which still remain town ways. In the course of his talk Mr. Parker said:

It is my belief that the macadam road as now built, with modifications such as different road builders adopt under different conditions, such as the use of only No. 1 stone, with a sand binder, filling the road completely during the process of rolling, where traffic is heavy, and other small changes, will not be materially changed, whatever damage may be caused by the use of automobiles on the highways. It may be, and undoubtedly will be, that a material will be found, if it has not already been found, which when placed upon the surface or embodied in the top course of a macadam road will offer a surface which will not be destroyed by the corroding action of automobile wheels. It may be proper to say here that this Commission has experimented for several years in the use of tar, pitch, asphalt and oil in surfacing and even building roads, and it is not yet prepared to say what material, if any of those experimented with, will become the material for a permanent road structure. That the automobile has introduced a wholly new condition is undoubtedly true. It is also undoubtedly true that it has caused the revolution of the theory of the macadam road.

Commissioner McDonald of Connecticut urged the importance of trunk line highways in New England. The only way to bring these about, be said, is to take the money out of the State treasuries. He said:

The roads are first for the business of the State and then for pleasure. When the automobile came, with its persistent and annihilating ways, it caused many sleepless nights to the various commissioners and some of them could not help saying, "O, Lord, how long, how long?" But we have realized that the automobile is a permanent institution and we are now trying to meet its demands as best we can. The single "cider-jug and hoe-handle road-building brigade" should go. I would substitute for the words "Democrat" and "Republican" the good roads platform and "a business administration."

Former Governor Bachelder, discussing "Automobiles and Their Regulation," said in part:

It is in regard to the regulations relating to the registration and identification of automobiles, and their equipment with lights, brakes, horns, etc., that there would seem to be the greatest

Making a Wayside Repair on One of the Straightaway Stretches of a Characteristic American Road.

Pennsylvania Scenery That Skirts the Highways.

need for uniformity. The present diversity of laws on these points makes it possible for an automobile owner who is duly registered in bis own State, and has complied with all the requirements of its laws, to be an unconscious lswbreaker in an adjoining State because of a misunderstanding as to the nature of tbe regulations covering certain minor details. This matter should be taken up promptiy by the Legislatures of these States so that an agresment can be reached as to a simpls code of regulations, providing for the public safety, but interfering as little as possible with the orderly and reasonable use of the automoblie.

Uniformity is also highly desirable in regard to the taxation and licensing of automobiles. As these vehicles are personal property, and presumably taxed by the district in which their ownsrs reside, a tax imposed by the State is double taxation, and therefors opposed to our principles of government. A reasonable license fee can properly be charged, but there would seem to be no justification for imposing taxes on this particular kind of property.

In this connection I may refer to the proposition for Federal registration of automobiles used in interstate travel, which has been advocated at ssveral sessions of Congress. It is not proposed that Congress should interfere with the power of the various States to prescribe regulations governing the safe operation of motor vehicles, but merely to provide for a system under which an automobile registered in the State of its owner's residencs and also by the Federal Govsrnment, shall bave the right to travel over the roads of all other States without the payment of any additional tax. It is urged by the advocates of this legislation that its snactment will not only do away with the present system under which the citizen of one State is subject to vexatious restrictions and taxes by ths various States through which he may wish to travel, but will tend to further the adoption of uniform and reasonable legislation.

In conclusion I would sumbit that there is urgent nesd for a concerted movement by the various automobile clubs and associations to bring their influence to bear on tbe owners of these vehicles, with a view to securing a faithful compliance with the spirit of the laws regulating their uss on the public highways. There is no question but that public sentiment is ths most effective factor in checking dangerous driving, and if automobilists will join in a campaign against reckless speeding, tbey will make it much easier to secure the enactment of fair and liberal legislation on this subject.

Among those who participated in the discussion, following the reading of the stated papers, were Colonel W. D. Sohier of the Massachusetts Highway Commission, who urged the necessity of curbing the reckless operator and putting a stop to driving by intoxicated persons, and Francis Hurtubis, Jr., of Boston.

On a Southern Road Used Where They Haul Cotton.

WHO HAS NEW YORK STATE'S NUMBER ONE?

In view of the fact that the registration in New York State is now close to the 65,000 mark and that much of it has been added in the past year or two, inferring that a very large percentage of the total number of cars represented by this unprecedented figure are still in actual use, more than the usual amount of interest attaches to the fate of the first thousand hangers, and particularly to the now historic Number 1. Who has "N. Y., No. 1?" Likewise, who has "N. Y., No. 13?" Seen going down Broadway either one of them would attract no small following and the speed of its carrier would probably not permit of its too ready escape from the curious. It would be interesting to learn whether the first 1,000 New York hangers are still doing duty in their legitimate field of activity, or whether the majority of them have not found honored places as wall decorations in the homes of their owners. If any of our subscribers happen to be the proud possessors of cars the registry of which was made sufficiently early to come within this limitation, or know of the existence of such cars that are still in active service with their original tags, we should be pleased to learn the make of the car and something of its record. Doubtless a very large proportion of that first thousand cars were of foreign manufacture, and nothing could tell the story of the success of the American manufacturer more strikingly than the changing character of the registration of New York State as it progressed into the thousands and tens of thousands.

GOOD ROADS WORK IN THE SOUTH.

ATHENS, Ga., Nov. 9.—To advance the good roads movement in the South, the State College of Agriculture proposes to hold a good roads school next January in this city. At this time a course of lectures and demonstrations will be givcn for the purpose of instructing those who attend in the best ways of accomplishing the much-needed road improvement in the South. Besides the men from the college, who will deliver lectures, many experts in road construction from all over the country will be here to aid in the good work. People in every section of the State are much interested in the movement, and from the present indications this first attempt will be a complete success.

RUBBER AS A MATERIAL IN PAVEMENT.

Asphalt, alone, as a material for pavement, has its limitations and the wearing qualities of rubber would seem to have value in this connection. This is especially so in view of the fact that a process—used in France—is such that the asphalt and the rubber enter into combination with each other—cold—which combination, on a concrete foundation, is proving to be far more durable than asphalt pavement in the absence of rubber. The asphaltum—reduced to powder—and the rubber, in acceptable form, are suitably combined and applied to the concrete, after a sizing coat, to the desired thickness and rammed.

HOW TO PASS OVER A WATER BREAK.

Water-breaks are still numerous in many parts of the country. If possible, take them straight, at a slow enough rate of speed that the jar is not too great. If they are taken at an angle, the frame will be racked and twisted, loosening things up more than hundreds of miles' running would do. To prove that the twisting of the frame affects the car, raise any wheel so that the tire is six inches off the floor. Then try and turn the motor over with the starting crank. It will be found almost impossible, the twisting of the frame affecting the engine base also and throwing pressure on bearings far in excess of what they should stand.

Some Things Mr. Miltoun Encountered En Route.

IF laws forbidding street obstructions were enforced with half the fervor with which the local bumbles all over the world put the screws on the automobilist for fancied sins of omission and commission there would be considerably more safety for chauffeurs. Not all of us are reckless drivers, nor are most of us heedless of the welfare of others. Sometimes, ofttimes, in fact, it is we—who pay by far the highest taxes ever known for the use of public (sic) highways—who get more than injustice meted out to us all along the line.

France is the land of automobile touring par excellence, as we all know; the land of good roads and good cooks; and how well the two go together only the touring automobilist in France really knows. The following recitals are selected at random from the notes of the writer made during sundry tens of thousands of kilometres of roving up and down la belle France during the past five years.

In The Charente, in the thickly populated west of France, at Pons, a tiny town not marked on every road map, on the direct road from Bordeaux to Paris, the great Route Nationale runs straight through the vaulted substructure of an old-time monastery. It is a safe enough road under most conditions; at other times it is not so safe, as, for instance, when one meets with a throng of peasant folk returning from market. Within the depths of this cavern, on one happy autumn Saturday, we came unawares upon a flock of sheep attended by two dogs and a small boy, three donkey carts and two calves attached by a cord to the hindermost. There was a horrible mix-up, too horrible for words to describe. Our radiator smelt of burnt wool for a long time after, and there was one sheep less in the world, a dog with a lamed paw and a badly scared crowd of donkeys, both of the human and animal genus. Whose fault?

It is a question as to which is the silliest, least responsible, most provoking thing of life, which obstructs the roads which should be free to wheeled traffic—the other kind as well as that which rolls on pneumatics.

Through a flock of half a hundred silly hens, running hither and thither over one of the most used portions of the great highway across Normandy, between Paris and Trouville, the writer caught only one. Again: Whose fault?

"A Valence le Midi commence," was a phrase we had learned by heart out of Daudet's masterpiece, "Tartarin of Tarascon." Valence is a hundred and fifty kilometres north of Tarascon, on the famous road by the Rhône, known of all automobile travelers between the north and the south of France.

We never changed our gears once during the traject, and with thoughts of a real Provençal déjeuner, with the wine of the Rhône, black olives, the "beurre de Provence" and all the rest at the Hotel des Empereurs, we plunged into the heart of Tartarin's birthplace, with no more than the usual care in entering a conventional French town of its class. Before we knew it we were in the midst of a half a hundred café tables and chairs, the occupants fleeing in a horrible fright in all directions.

Tarascon was en fête, and the proprietor of the Café de France in imbecilic fashion had extended his establishment out over the width of the street, almost to the opposite curb. No one was killed, but everybody got a scare—ourselves as bad a one as the rest. Before the dreamy Provençaux could gather themselves together we were off again. We did not eat déjeuner at Tarascon; the better part of valor was to make wheel tracks south and that as speedily as possible. No one was killed, but a score might have been though, through no fault of ours. Whose fault, then, this time, if you please?

The automobilist's mattress is not always made of roses. Moreover, the automobilist is not a murderer by choice—not even of hens and chickens, who are not road users at all; at least, they pay no taxes for the privileges which they so generously make use of. The rest of us do, and so long as the powers that be give us good roads for our money we are content; it is when the country bailiff puts it in his own pocket that we object.

FRANCIS MILTOUN.

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AMERICA'S FOREIGN CAR RACE.

Judged from a spectacular point of view, and giving at the same time full credit for the very complete arrangements in its carrying out, the foreign car race at Savannah, known as the Grand Prize of America, was the best event of an automobile racing character ever seen in this country. Furthermore, one well known expert who has been at all the European contests is authority for the statement that he has never seen anything as good on the other side, where there may have been larger fields and greater financial returns, but less thoroughness in management and intensity in the struggle itself.

The event at Savannah was third in a series which began at Dieppe, was renewed at Bologna, and concluded on American soil. France lost to Germany in the first race, succumbed to Italy in the second, and now the Italians have again taken the honors in the third motor battle. Opinions differ as to whether the race at Savannah was either necessary or logical. It would not have taken place if the Automobile Club of France had not supported the Automobile Club of America in the latter's contention with the American Automobile Association. There were several speed races in Europe this year which did not observe the much mentioned Ostend rules. Apparently any substitution thereof for these rules was wrong in America. Might often is a deciding factor these days. The big club of France may be sorry now that it made Savannah possible.

However, Savannah rose to the occasion in grand style, and, profiting by the stock car racing of last March under A. A. A. auspices, it left absolutely nothing to be desired within its physical and road limitations in supplying a perfect course and as perfect guarding. All that remained for the A. C. A. was to bring on its show, and the talent included fourteen of the best foreign cars and drivers, with six American starters to complete the score demanded by Georgia's enterprising city. The race was costly both to the city and to the club, but Savannah considers that it received profitable advertising in plenty and the club preserved its "foreign prestige." And those present saw a magnificent racing spectacle.

In furthering the selling of cars, the value of the event is problematical, and whatever the amount in advertising, it will figure mostly in the "general results" column. The winning importer may "cash in" his outlay and some more besides. The others may say that racing does not pay.

The futility of American makers engaged in such racing, with hurried and inadequate preparation, was never more glaringly demonstrated. They injure themselves, and the American industry as a whole loses in reputation. If a thing is worth doing at all, it is worth doing well. If we will take the time and devote ourselves conscientiously to the task, we can hold our own and share the honors in racing. But let us hereafter remain beside the road when we have not the time to get fit.

* * *

SPIDER WEAVES HIS WEB TO NO PURPOSE.

When the ordinary grades of steel to be had for automobile construction failed to satisfy the needs of the occasion, the demand was for finer products, which the fabricators of the same promptly offered, not forgetting to charge a most unholy price. No sooner did they get used to the idea of the high price and the smell of quality necessary to accompany it than they were shocked at the lack of appreciation of automobile engineers, who promptly evolved a plan by means of which they were enabled to utilize the cheaper grades of steel, inducing in them at will the qualities required.

The heat treatment of steel is not new, nor did automobile engineers do more than bring it to the high state of perfection that now enables them to impart to the steel they use the several qualities demanded for the respective parts. By suitable manipulation it became possible to render the steel hard or soft, ductile or dynamic, and, in diverse ways, exactly in accord and with the most precise requirements.

The same method of bringing the structure of the steel up to the especial requirements, in view of the work to be encountered, possesses the virtue of lending itself to the plan, in that the heat treatment is an after process, so that the steel at first can be fashioned into the required shape (in its soft state), and it can then be rendered fit, even though the requirement is for glass hard surfaces over a highly kinetic core. Users of automobiles are benefited materially by the process, since they are afforded initially sound and serviceable parts at a low first cost. Better yet, the cost of replacement is very low indeed. The coming of the automobile was the signal for a display of the potentiality of mind over matter.

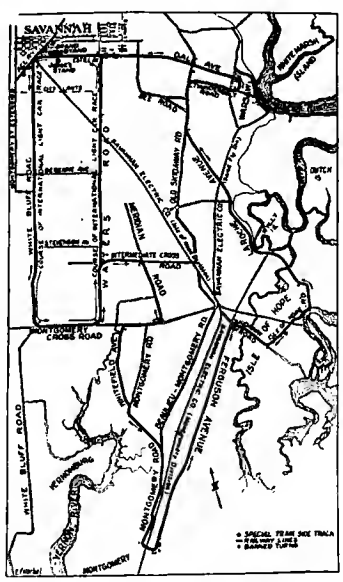
GOSSIP OF THE RACE

Fournier, the Well-Remembered Paris-Berlin Winner, Whose Itala Finished Just Outside the Prize Money.

Among Those Present.—The trade was generously represented at Savannah, and the list included the following: George P. Tangeman and C. H. Tangeman, of the Hol-Tan Company; Alfred Reeves, general manager of the A. M. C. M. A.; Paul LaCroix, Renault Frères branch; Lee Counselman and C. H. Page, Chalmers-Detroit Company; R. H. Johnston, Lewis S. Masuay and Secretary A. R. Warner, White Company; Benjamin Briscoe, F. D. Dorman, F. J. Tyler, Messrs. Monroe & Denzer, the Buffalo agents, Commodore McCloud and Gabriel Cheiro, the Detroit agent, Maxwell-Briscoe Motor Company; Horace DeLisser, Ajax-Grieb Tire Company; L. D. Rockwell, Standard Welding Company; E. V. Hartford, Hartford Suspension Company; Ned Broadwell, Fisk Tire Company; Guy Vaughan, F. B. Stearns Company; E. S. Partridge and A. W. Church, Wyckoff, Church & Partridge; H. A. Lozier, C. W. Mead, C. A. Emise, John G. Perrin, Lozier Motor Car Company; M. Hauvette-Michelin, nephew of M. Michelin, and J. C. Matlack, of the American Michelin factory, Milltown, N. J.; William Mitchell Lewis and James Gilson, Mitchell Motor Car Company; Alexander Dow, Dow Tire Company; J. Frank Eveland, New York agent of Stevens-Duryea; W. B. Hurlburt and C. R. Teaboldt, Garford Motor Car Company; Egbert Lillie, Itala Import Company; Clare M. Hamilton, Isotta Import Company; J. S. Josephs, Fiat Import Company; Andre De Magnin, Panhard & Levassor Import Company; William DuCros, Dunlop Tire Company.

A. C. A. Steamer Party.—The *City of Savannah*, of the Savannah Line, which had been chartered by the Automobile Club of America, had a memorable, happy, and some say hilarious voyage. The ship sailed from New York on Saturday evening and reached the entrance to the harbor early Tuesday morning, but did not dock until that afternoon, having been held up by fog at the mouth of the Savannah river. The following evening the clubmen gave a largely attended reception to Savannahians. The ship was trimmed with lanterns and the deck given over to dancing. A speech of welcome was made by Mayor Tiedeman, to which Winthrop E. Scarritt, a former president of the club, responded with appropriate eloquence. The *City of Savannah* sailed out of the river at 9 o'clock Saturday morning and docked in New York on Sunday at 2:45 P.M. The ship's hold was filled with touring cars belonging to the members aboard.

Maxwell-Briscoe Ladled Out Shrimp Soup.—Among the social functions of race week was a supper given to the newspaper men at the Casino, at Thunderbolt, by Carl W. Kelsey, manager of the Maxwell "mosquito fleet," in behalf of the Maxwell-Briscoe Motor Company. Shrimp soup, fried hominy, and other Southern dishes were forthcoming to tickle Northern palates. The souvenirs were miniature steins. Frank T. Battey, president of the Savannah Automobile Club, was by common consent installed as the guest of honor. He jollied and was jollied, you may rest assured, to beat the band. Kelsey modestly promised that the "mosquito fleet" would be running at the finish, and made good, and landed two of the little cars near enough to be timed before the race was closed.



Map of the Course.

Waldon Still Enjoys Racing.—While it is a fact that the Packard Motor Car Company hasn't been interested in racing for some time, S. D. Waldon, its sales manager, seldom misses a big contest, and, of course, he was present at Savannah. It may have been forgotten by many that once upon a time the Packard Company had a racing craft called the *Gray Wolf*, designed by Charles Schmidt, a former comrade of Fournier. This craft in the early days of the Ormond-Daytona racing journeyed to the Florida beach, where it accomplished a mile in 46 2-5, which at that time was only 2-5 of a second lower than the world's record held by Augieres with a Mors car over twice the horsepower of the *Gray Wolf*. Mr. Waldon was in charge of that record breaking expedition.

Winning Lancia Used Continentals.—In the light car race the Lancia was the only car equipped with Continental tires. According to one story that was current before the race, Hilliard sent for J. R. Cothran, the Continental representative at Savannah, and asked him to wire Joseph Gilbert, the American manager, asking that the arrangement for prizes be changed so that only one prize of $500 be given and that for first position. "I intend to win the race, not run second or third," said Hilliard. The request to New York was granted by Mr. Gilbert, and the result was that Hilliard received $200 more from the tire company than would have been the case under the original offer.

Special Trains to the Race.—Excursion trains were run from New York on several lines. Noteworthy among them was the "Wall Street Special," promoted by Mills & Moore, who, the passengers say, made good their promise that it should be a veritable "train de luxe." It left Savannah after the race and landed its passengers in New York early Friday evening. Its success was so pronounced that its promoters have announced their intention of running these trains de luxe to all big motoring functions, beginning with the proposed Cuban race in January.

"Van" Had a Narrow Escape.—The night before the light car race N. H. Van Sicklen, who did much to make the Savan-

nah races of March last a success, had a narrow escape at the hands of an amateur owner from Augusta. The latter crossed to the wrong side of the road at an "S" turn and there was a head-on collision with Van's Jackrabbit, which left the latter minus front wheels and with other marks of the encounter. Luckily no one was injured, though both cars were badly wrecked. The accident happened in the dusk of early evening.

Absence of "Herb" Lytle was Noted.—There were many inquiries for "Herb" Lytle, whose driving of the Apperson at the March meeting was well remembered. The information was current to the effect that the popular driver was suffering from typhoid fever, supposed to have been caused by a bad mess of oysters, eaten at a well-known New York hotel. Several others of the same party similarly became ill. The latest from Toledo, O., is that Lytle has had a relapse and is threatened with pneumonia, and that his condition is far from encouraging from the physician's point of view. He has the wishes of a host of friends for a speedy return to health.

Said the Savannah Press: "To each and every one of the thousands of strangers who are, and will be, within out gates to-day and to-morrow Savannah bids a hearty Welcome to Our City! Some of the visitors are distinguished and many more are not; some are rich, but the majority could not with propriety be placed into that category. But the welcome to everybody, without reference to Bradstreet rating, is sincere and hearty. Savannah is mightily pleased to have all of these people visit her, and she will do everything in her power to make their stay agreeable."

The Foreign Delegates.—Chevalier Coltelletti was the only real special delegate from abroad, and he represented the Automobile Club of Italy. George E. McQuesten, a Bostonian, who is a member of the Royal Automobile Club, figured as the British delegate. Charles Raoul Duval, who is connected with the importing of a French car, was the authorized delegate of the Automobile Club of France. Apparently, Pontus Lindstrom. the delegate from Sweden, did not appear on the scene, nor did any one come to represent Germany.

Big Betting with the "Bookies."—Betting on the race was frankly carried on in the De Soto lobby and on the grandstand. Tod Sloan, the jockey, and Kid McCoy, the pugilist; Fellowes & Company, and other bookmakers were on hand and made books well up in the thousands. The Fellowes book was in combination with another big book run at one of the prominent "Rialto" hotels. The Lancia was favorite for the light car race, and Hemery for the Grand Prize, Nazzaro and Wagner ruling as second choices at 4 to 1.

From New Orleans to Savannah.—There was a notable display of touring cars in the parking spaces at the grandstand. Several hundred cars were driven over the roads. The distinction of having driven the furthest and over the most difficult roads to attend the races belonged to R. D. Lambert, who drove in his 30-horsepower White steamer from New Orleans, a distance of 1,150 miles. Mr. Lambert was eight days on the road, and almost all of the journey being through deep sand or heavy clay roads for which the intervening distance is noted.

What the Michelin Man Says.—F. W. Libby, of the Michelin Tire Company, is quoted as follows: "In the light car race four out of the first five used Michelin tires. In the Grand Prize the first four cars used Michelins, as did seven out of the nine that finished. We are pleased, but not exalted. Our tires do their work. People learn that there must be a reason behind a tire that continually carries the greatest cars and drivers to victory in the world's greatest contests."

Henry Ford Still Keen on Racing.—Ever since he built the "999" Henry Ford has retained his interest in racing, though he says that it interferes sadly with the regular routine of a big establishment. "If we get caught up on orders," said he at Savannah, "we may yet build a racing car, despite the fact that it disarranges factory routine to an alarming degree."

Vanderbilt Winner Was An Onlooker.—One of the most interested observers of the race was George Robertson, who won this year's Vanderbilt race, driving the 120-horsepower Locomobile. Robertson was to have been in the light car contest, but, unfortunately, the Gregoire arrived in such condition as to make its starting impossible.

Banquetted at Café Martin.—Joseph S. Josephs, president, and E. Rand Hollander, general manager, of the Fiat Automobile Company, at the Café Martin gave a banquet last night to Wagner, Nazzaro and De Palma, who had the mounts on the Grand Prize Fiats. The other foreign drivers in town were also invited.

Lubricating the Lancia.—Nowadays the interest concerning a winning car seems to include almost everything connected with it. Therefore, the G. A. Hawes Company, makers of Panhard cylinder oil, are priding themselves upon the fact that the Lancia car used Panhard oil.

Chairman of the Vanderbilt Commission Was An Official.—Jefferson deMont Thompson, chairman of the A. A. A. Racing Board and Vanderbilt Cup Commission, was among those present, which also included Robert Graves, another well-known member of the commission.

Lubricating the Grand Prize Cars.—Seven of the nine cars, including the winning Fiat, that finished in the Grand Prize race used Monogram oil. Mr. Stow, a representative of the Columbia Lubricants Company, of New York, is the authority for the statistics.

Clubs Had Latch Keys Out.—The Oglethorpe, the Hussars and other clubs had their latch keys out for all visitors ready and eager at all times to give the Northerners a taste of Southern hospitality in most palatable and quenching form.

Donlin Made a Hit.—W. J. Donlin, secretary of the Chamber of Commerce, who was Savannah's press guardian, was on his job to such good purpose that he sent away every newspaper man an enthusiastic press agent for Savannah.

"Joe" Tracy Saw the Race.—One of the most interested spectators was Joe Tracy, the former Locomobile pilot of the 1906 Vanderbilt race.

How Jervis Puts It.—This is his comment: "At Savannah the trees are moss-grown, but the citizens appear very far from being moss-backs."

A. A. A. NOW HAS 187 CLUBS AND 20,000 MEMBERS

THE sixth annual meeting of the directors of the American Automobile Association was held at national headquarters, 437 Fifth avenue, New York, Monday. The morning session was of the outgoing directors, the afternoon, a preliminary meeting of the new board recently elected which took office Wednesday. Both sessions were largely attended, that in the afternoon being notable for the presence of nearly forty directors, representing as many clubs. Both sessions were presided over by President W. H. Hotchkiss. The annual reports of the officers were filed and considered and many detail matters disposed of.

The more important matters considered were those suggested by a conference of directors and State officers held at national headquarters November 20 and 21. At this conference there was also a large attendance, representatives being there from no less than twelve State associations and through such State associations, about 100 clubs. The more important matters suggested by this conference, the results of whose deliberations were quite generally approved by the board of directors, were the following:

No More Sanctioning of Racing on "Horse Tracks."

After two years of agitation within the Association, the following resolutions were emphatically and unanimously adopted:

Whereas, Automobile speed contests on circular tracks built for horse racing has ceased to serve any useful purpose; and

Whereas, Such contests do not have the approval of the general public or any considerable portion thereof; be it

Resolved, That speed contests by automobiles on circular tracks built for horse racing and of a mile or less in length be condemned by this association; and be it

Resolved, That hereafter this association have nothing whatever to do with such contests.

It was voted to begin as soon as possible the publication of a monthly official journal similar to those issued by corresponding bodies in other nations, and the publication of such journal was placed in the hands of a temporary committee.

The report filed by Secretary Elliott brought out some interesting statistics, particularly with regard to automobile contests and the spread of the national idea represented by the American Automobile Association. During the past year but twenty-four sanctions for track meets were granted by the Racing Board as against fifty-two in 1907; while on the other hand, twenty sanctions were granted for hill climbs as against five the year preceding.

Growth of the Membership.

In the matter of membership, the national body now has 25 State associations as against sixteen a year ago, and 187 clubs as against 132 then, while the official membership of its present clubs was then about 17,000 and is now upwards of 20,000.

Practically all of the Northern States, with the exception of Maine, New Hampshire, and Iowa are now federated into State associations; similar associations exist in California, Colorado, and Oklahoma, while movements looking to State bodies are already under way in Iowa, Arkansas, Montana, North and South Dakota, Washington, Oregon, Louisiana, and several of the other States. A notable fact is the growth of some of the more important clubs, that of Buffalo having increased from 1150 to 1501 members; the New Jersey Automobile & Motor Club of Newark from 640 to 1450; the Philadelphia Automobile Club from 400 to 800; the Automobile Club of Kansas City from 320 to 520; the Automobile Club of Southern California from 330 to over 500; the Automobile Club of Minneapolis from 400 to 580; and the Springfield (Mass.) A. C. from 150 to 300.

Included in the Report of President Hotchkiss.

In the course of his very interesting report, President Hotchkiss supplies the following information concerning the work of the association:

THE NATIONAL IDEA.—The notable feature of the year's work is the growth and strength of the national idea. During the first years of the association's history, the sport governing function was prominent, and, as most sporting events were in the neighborhood of New York and the association did little to stimulate the interest of clubs outside of that territory, the national idea was not brought out. It was not then fully appreciated that in the United States one club and one neighborhood could not control or dictate. This is now understood and appreciated even in the so-called metropolitan district. In the nature of things, national headquarters should, for a time, be located in New York, but any policy which recognizes conditions in New York as controlling upon the affairs of motordom in all of the States, territories and federal districts of the Union will inevitably fail. In this connection, I quote from the monthly bulletin for November of the Automobile Club of Philadelphia.

"A word now to the motor user: As an individual, you cannot bring about the result you want, nor yet as a local club, nor as a single State federation. You must combine nationally—the man into the local club, that club into a State body, and this, in turn, into a compact national organization. * * * The above tells you the reason for the existence of this club, the Pennsylvania Motor Federation and the American Automobile Association. No single club, local or State, can do this work in the American spirit; it must be a representative body, reflecting the will and action of the local movement everywhere." This is the national idea!

LEGISLATIVE BOARD.—The work of this board has been splendidly done, largely because of the efficient service of its chairman, Mr. Terry. Indeed, when federal registration shall have become an accomplished fact, to him will belong the credit. It is currently reported that the members of the Judiciary Committee at Washington frankly admitted that no bill was ever argued before them with more ability and cleverness than was the federal registration bill by Mr. Terry last March.

GOOD ROADS BOARD.—The work of this board was largely in connection with the convention at Buffalo. That it was well done cannot be questioned. It resulted in the appointment of a national committee, representing all the cooperating bodies, to which was committed the convention of next year. Such convention will thus be largely in our hands, through the good roads board. Work should be begun at once, and the convention held in the summer or fall. I cannot too strongly comment on the very efficient work of Chairman Hooper of this board.

The meeting was protracted and there was an animated discussion of many matters of vital interest to American motordom. This discussion will be continued at later meetings this week.

Hotchkiss Consents to Serve Again.

At the adjourned meeting of the board of directors, held Wednesday afternoon, the following officers were elected for the ensuing year: President, Wm. H. Hotchkiss, Buffalo, N. Y.; first vice-president, L. R. Speare, Boston, Mass.; second vice-president, Ira M. Cobe, Chicago, Ill.; third vice-president, Frank M. Joyce, Minneapolis, Minn.; treasurer, H. A. Bonnell, East Orange, N. J.; secretary, F. H. Elliott, New York.

President Hotchkiss immediately announced the appointment of the following chairmen of boards: Legislative, Charles T. Terry, New York; Good Roads, C. Gordon Neff, Cincinnati; Contest, Frank B. Hower, Buffalo; Touring Information Board, Powell C. Evans, Philadelphia. The Racing Board was abolished and its functions vested in the Contest Board.

The following executive committee, in addition to the president, first vice-president, secretary, treasurer, and board chairmen, was named: S. A. Miles, New York; H. O. Smith, Indianapolis, Ind.; Wm. E. Metzger, Detroit, Mich.; Oliver A. Quayle, Albany, N. Y.; Paul C. Wolff, Pittsburg, Pa.; W. C. Crosby, East Orange, N. J.; Jas. T. Drought, Milwaukee, Wis.; C. H. Gillette, Hartford, Conn.; Frank G. Webb, Brooklyn, N. Y.; Frank M. Joyce, Minneapolis, Minn.; J. P. Coghlin, Worcester, Mass.; L. E. Myers, Chicago, Ill.; Edwin S. George, Detroit, Mich.; John Bancroft, Wilmington, Del.; L. J. Powers, Jr., Springfield, Mass.; H. M. Rowe, Baltimore, Md.

The first three named were officially designated by the National Association of Automobile Manufacturers at its executive committee meeting held Wednesday to serve on the A. A. A. hereafter. This action on the part of the national body of manufacturers indicates co-operation between the two bodies that should have notable results.

O. P. Fritchie and His Long Distance Electric.

RECORD-BREAKING TRIP IN AN ELECTRIC.

In order to demonstrate what his electric car was capable of, Oliver P. Fritchie, president of the Fritchie Automobile and Battery Company, of Denver, Col., started from Lincoln, Neb., November 2, and reached New York City on Saturday last, having been but 28 days on the road. Of this period only 20 days were given up to traveling, the remainder of the time being spent in Chicago, Pittsburg and other towns along the route, so that the car averaged 90 miles a day for the 1,800-mile run, coming over the A. A. A. tour route from Pittsburg to Philadelphia and New York. On Wednesday last, Mr. Fritchie left New York for Washington, D. C., where he intends to establish an agency; he is also seeking to locate a factory site somewhere in the East. Later in the season he will drive the same car to Chicago for the show there.

The car in which the long trip was so successfully made is an electric victoria of the Fritchie company's make and is geared for a maximum speed of 19 miles an hour, while it is capable of traveling 100 miles on a single charge of the batteries, though its longest day's run was 125 miles, after leaving Toledo. The shortest day's run was in the blue clay mud of Iowa through which only 45 miles could be accomplished. The car was equipped with Goodyear tires and suffered no tire troubles on the run. Though the trip demonstrates the worth of the car, it is not to be inferred that the electric is a touring vehicle, for according to Mr. Fritchie only an electrician could make headway, as at many towns he had to do all the work himself. Mr. Fritchie was accompanied by Mr. Pfaff of his firm.

PACKARD ESTABLISHES AN AUTO SCHOOL.

DETROIT, Nov. 30.—In order to help local owners of Packards to a better understanding of the construction of their cars and the proper methods of handling and maintenance, the Packard Motor Car Company has established an owners' school which has now been holding weekly sessions each Tuesday night out at the plant. Last week the opportunity was taken of showing the pupils the working of a large automobile building plant at night, as the Packard factory has been running overtime full blast, employing its entire personnel of 3,100 men. The occasion was of considerable more interest under electric light than would have been the case in the daytime. Passing through each department, E. B. Finch, manager of the Technical department of the company, who is acting as instructor, gave his class impromptu lessons in construction and assembly, taking as his models the parts and cars in the various stages of completion as found in the different departments visited. The class has increased at each session and now includes two score of Detroit's most prominent citizens. The course includes a detailed description of the Packard car and its workings, with many digressions into other lines concerning the practical operation of automobiles.

DRAWING FOR THE BRESLIN SHOW SPACES.

Local branch managers and agents of cars to be exhibited at the Madison Square Garden and Grand Central Palace shows were entertained at the Hotel Breslin on Tuesday afternoon, incidental to the usual drawing for the privilege of placing a car on exhibition in the Breslin during each of the shows. Representatives of the A. L. A. M. and the A. M. C. M. A. cars both had a drawing. The former was won by E. W. Heddington, for the Haynes, and the latter by Emerson Brooks, for the Pennsylvania. Walter E. Hildreth, the Breslin manager, welcomed the guests. Brief speeches between courses were made by C. F. Clarkson, of the A. L. A. M.; Alfred Reeves, of the A. M. C. M. A.; Victor Breyer, of L'Auto; E. E. Schwarzkopf, president of the Flat Tire Club; R. B. Johnson, of the New York *Sun*, and A. G. Batchelder. John C. Wetmore acted as toastmaster.

These were the trade representatives present who participated in the drawings: A. B. Cordner and W. H. Flinn, Acme; E. W. Heddington, Haynes; W. K. Carrutbers, Mitchell; C. Trewin, Welch; H. U. Kibbe, Renault; Richard Newton, Stoddard-Dayton; A. J. Picard, Stearns; E. W. Nicholson, Midland; C. M. Hamilton, Isotta; Frank Eveland, Stevens-Duryea; H. R. Mallow, De Luxe; Harry Fosdick, Lancia; LeRoy Moody, Allen-Kingston; C. W. Bennett, White; W. J. Lasher, E-M-F; C. F. Redden, Studebaker; H. W. Nuckols, Columbia; Emerson Brooks, Quinby; Herbert Strong, Pennsylvania; C. H. Page, Chalmers; J. A. Clark, Peerless, and D. C. Fenner, Knox.

GARDEN DECORATIONS PROCEEDING APACE.

Under the direction of W. V. Knowles, architect in charge of the decorations that are to transform Madison Square Garden on the occasion of the Ninth Annual Automobile Show to be held there January 16-23, under the auspices of the Association of Licensed Automobile Manufacturers, the work on the huge triumphal arch is now being carried ahead rapidly. This enormous piece of staff construction is to have a span of 48 feet and will stand 87 feet high. It will be erected at the rear, or Fourth avenue end of the Garden, resting on four Roman-Corinthian capitals and will form the *piece dè resistance* of the decorative scheme. These columns measure 3 feet 6 inches in diameter, and one-fourth of them will be embedded in the arch itself, the remainder standing out in relief. Between the columns will be three bays, their arches being just beneath the cornice, while their bases will be at the balcony rail. In these bays will be massive plate glass mirrors, the center one measuring 20 feet in width, while the side glasses will be but one foot smaller. The arch will be a background for the Garden's decorative scheme.

Massive Triumphal Arch for Madison Squa

FRENCH SALON IS NOW OPEN.

PARIS, Nov. 28.—The Automobile Salon in tbe Grand Palais this morning was opened by President Fallières, which substantially indicated the continued great interest in the industry. In an interview, just after tbe opening of the show, the French expert, L. Auscher, expressed himself in glowing terms.

M. Auscher seems to be favorably impressed with "Knigbt" motor, the latest novelty in France, and he points out that in tbis motor the valves (of the conventional sort) are done away with. The valvegear is also out of the way, and there are no more springs, nor bolts, pusbing on stems. The noise of seating valves is done away with, and, in fine, the Frencb Knigbt motor is regarded by bim as something to take notice of. It is pointed out that there is yet the commercial try-out to be considered, and while the motor looks good, the practical demonstration may be relied upon to tell the tale. The "shaft drive" is much in evidence, and to the despair of "side-chains." The taxicab has assumed very great importance, and is now regarded as a regular product by all the makers of importance. Commercial automobiles are being exploited at some length, and the future of the commercial, in France, is most promising. Nearly every maker of any note has evolved a light type of car, and the future of the industry, in France, at any rate, will depend largely upon the success of the light automobile.

IMPORTERS WANT DUTY REDUCED.

WASHINGTON, Nov. 27.—Automobile importers sent Charles H Sherrill, lawyer, to lay some facts and arguments before the Ways and Means Committee to-day in favor of reducing the duty on automobiles from 45 to 30 per cent. The rate recommended was presumably to represent the difference in the wages of workingmen abroad and at home in the automobile factories.

The committee learned from Mr. Sherrill that only the skeletons of tbe running part of automobiles were imported, all tbe rest of the machine, including many of the castings, being made in this country. In this respect be thought automobile importers were different from all other importers, being indirectly large employers of American labor.

A machine used as an example was the Italian Fiat that sells here for $6,000. It costs $1,600 plus the duty laid down in New York, and the importers spend $2,600 on it here in getting it ready for the road. Fifteen per cent. of the selling price went to the sales agent and the difference was the gross profit of the importer. Mr. Sherrill started to give accounts of the importers expenses out of that when Mr. Clark interrupted to say:

"You better stop figuring or you will put the importer in a bole."

The profits of the American manufacturer were fixed by a trust, Mr. Sherrill said, and were unreasonable. All but three concerns wbich made cbeap cars belonged to the combine, which dictated the price of all parts and the price at which the machine should be sold at retail. He thought revenues would be greatly increased by decreasing tbe duty.

Chairman Payne announced that none of the manufacturers of automobiles had applied for a hearing.

INDIANA ROAD ENTHUSIASTS ORGANIZE.

INDIANAPOLIS, IND., Nov. 30.—At a mass meeting, attended by good roads enthusiasts from all parts of Indiana, a permanent organization of the Indiana Bureau for Good Roads was formed at the Board of Trade Building last Tuesday night. The following officers were elected: R. A. Brown, 614 Indiana Pythian Building, president; George C. Pyle, vice-president; J. C. Crabill, 1609 Bellefontaine street, secretary, and F. I. Willis, 115 West Market street, treasurer.

[ROYAL MOTOR CAR CO. RECEIVER DISMISSED.

CLEVELAND, Dec. 3.—Tbe receiver of the Royal Motor Car Company has been dismissed and a new organization has been effected, which will immediately get under way.

THE CHAUFFEURS OF WILKES-BARRE, PA.

WILKES-BARRE, Pa., Nov. 30.—About fifty of tbe regularly employed automobile drivers of Luzerne County left on one big "joy ride" last week when the Chauffeurs' Club of Wilkes-Barre was started out on a "test." The start was made from room 45 of the Simon Long Building, whicb has been elaborately furnished by the members, who bope some day to be in the hall of fame with Robertson, Strang, Haupt and the other notables.

When the chairman called the meeting to order, all the "cut outs" were ordered closed, and as a result everything operated quietly. After adopting a constitution and by-laws, George Kessler was elected to preside at the wbeel. William Miller, employed by F. M. Kirby, was selected as the first driver behind the pilot, and Ralph Wolfe was chosen as general mechanician, with orders to look after everything for a year. Archie Roberts was given care of the funds and from the amount collected at the outset it is not likely the members will have to journey on "flat tires." To see that the road is kept clear for at least a year, Edward Brown, Joseph Doty, and John Zorzi were selected as a board of governors, while Isaac La France, John Cavanaugh, and Harry Richards were chosen as a membership committee to look after the "entry list." In appreciation for his services in assisting with the organization, Arthur A. Casper, a local car owner, was made honorary president.

MICHELIN AT WAR WITH A. G. A.

PARIS, Nov. 30.—Michelin is at war again with the Association Generale Automobile. This offshoot of the Automobile Club of France sells tires, automobile sundries, etc., to its members at the price they are usually delivered to dealers. Michelin objects to this, declaring that the Association is robbing legitimate traders of business by giving to rich automobile owners a commisson that rightly belongs to the dealer. Further the Association pays no trading tax, and is therefore robbing the State as well as the supply man.

The case is now before tbe Tribunal de Commerce at Paris, Michelin claiming an injunction stopping the trading of the Association, an indemnity of $40,000, and insertions in the newspapers. The defense of the Association is that the Tribnnal is not competent to judge the case, for it has been recognized by the revenue authorities, after a thorough examination of their books, that they are not a trading body. They declare that they do not sell direct to their members, but transmit all orders received by them to an agent who, for special reasons, is able to give a discount of 5 per cent. on tbe Michelin product.

There is no doubt that a certain amount of harm is done to agents by the system of giving discounts to members as practised by the Association Generale and other bodies. The point is whether such discounts are legal, and herein lies the importance of the case. Judgment has not yet been pronounced.

EVENTS SCHEDULED FOR PALACE SHOW WEEK.

In connection with the Grand Palace show, opening New Year's eve, the American Motor Car Manufacturers' Association announces the following schedule of special nights and meetings:

Thursday, Decembsr 31—3 P.M.—Private view of automobile show; Meeting, Executive Committee, New York Automobile Trade Association, 8 P.M., "Gala Night"; 10 A.M. Meeting, Show Committee, A. M. C. M. A.

Friday, January 1.—Army and Navy night.

Saturday, January 2.—Studente' night; 10:30 P.M., Show smoker to visiting motorists and dealers at A. C. A. Clubhouse.

Mondsy, January 4—2 P.M.—Executive Committee meeting, American Automobile Association; "Engineers' Night."

Tuesday, January 5—10 A.M.—Executive Committee meeting, National Retail Automobile Dealers' Association; "Society Night"; 4 P.M., meeting Board of Governore, Automobile Club of America; 1 P.M., Show luncheon to exhibitors by A. M. C. M. A., Hotel Manhattan; meeting, Society of Automobile Engineers.

Wednesday, January 6—10 A.M.—Meeting of Committee of Management, A. M. C. M. A.; 8 P.M., meeting Board of Directors, Importers Automobile Salon; Executive Committee meeting, Motor and Accessory Manufacturers; "Merchants' Night."

Factories of the Ajax-Grieb Rubber Company, at Trenton, N. J.

Carriage Dealers Invited to Palace Show.—At the request of a number of prominent carriage dealers who are selling automobiles in connection with their horse-drawn vehicles, the show committee of the American Motor Car Manufacturers' Association has decided to send an invitation to a selected list of 2,200 carriage dealers, each having a capital of $50,000 or more, requesting their presence at the big exhibition, which will open at Grand Central Palace, New York City, on New Year's Eve. Upon presenting the invitation each dealer will be provided with a badge giving him all the privileges of the show. This preferred list of carriage dealers, numbering 2,200, all enjoying the wide acquaintance of a wealthy buying public, and with their salesrooms and repair shops, should make excellent agents for automobiles and accessories. They are taking up with the auto very fast, and it is believed that the decision of the show committee to give them the recognition they deserve will bring the largest number of dealers that has ever attended a motor car exhibition.

Life of an Automobile.—Sales Manager Charles B. Shanks, of the F. B. Stearns Company, of Cleveland, who is reputed somewhat of a statistician among his newspaper friends, has figured out that the average life of an automobile is just about five years. Possibly the Stearns hustler bases his computations from the public motor car statistics made up by the fatherland of automobiling—France—where they figure from 1903, when there were 12,984 registered motor cars in that country, and when 6,900 cars were manufactured and 350 imported. At the end of 1903, however, there were only 17,107 automobiles, against the 23,234 that there would have been had all of them remained in service. By taking similar comparisons for the following years the estimate of 4.99 years as the average period of usefulness for an automobile was evolved, a period that will probably lengthen as the industry advances.

Peerless to Have New York Branch Building.—The Peerless Motor Car Company is to join the ranks of the prominent automobile concerns doing business on upper Broadway, New York City. Title has been taken to an "L" shaped parcel of property with a frontage of 70 feet on Broadway abutting that of the Baptist Tabernacle of Fifty-sixth street, and 25 feet on Fifty-seventh street. An eight-story fireproof building will be erected thereon, and the building will be ready for occupancy in time to look after the Fall trade of 1909. E. H. Parkhurst, vice-president of the Peerless Motor Car Co., in speaking of the decision to build a branch on Broadway, said that the move had been made necessary by the great increase of Peerless business in the Metropolitan district.

Private Railway at Franklin Factory.—It takes three-quarters of a mile of industrial railway to provide for the quick and easy transportation of materials among the many buildings at the plant of the H. H. Franklin Mfg. Co., at Syracuse, N. Y. With a product of the bulk of automobiles, made up of so many parts, intra-factory transportation is a problem, but it has been solved by this railway, which has now been in use long enough to demonstrate its continued utility. Everywhere about the grounds and in and out of the buildings the cars run on narrow tracks. Convenient switches at intersections make trips between buildings possible without wide detours. The cars run so easily that they are pushed without difficulty by a workman.

Moon Tour of the Great Southwest.—Henry C. Merrill, touring salesman for the Moon Motor Car Company of St. Louis, who is making a two months' tour of the Southwest in a Moon car, has arrived at Oklahoma City. Besides many smaller cities on his way, he will pass through Dallas, Fort Worth, Galveston and Houston, Texas, and New Orleans. The tour is significant of the confidence of the makers of the Moon in its capabilities, as the territory in question presents many obstacles to automobile travel, the roads being little more than a name. As Mr. Merrill is calling on present and future agents, they will have it brought home to them by visible means what the car can do under adverse conditions.

Proposed National Organization of Chauffeurs.—During the time of the Chicago automobile show it is proposed to form a national organization of chauffeurs. The subject was broached by the Professional Chauffeurs' Association of Louisville, Ky., shortly before the last Chicago show, and has been simmering since. President James B. Smith, of the Professional Chauffeurs' Club of America, has been in correspondence with the National Association of Automobile Manufacturers, and the result has been a determination to call a convention during the Chicago show, the date selected being February 12. The meeting will be held in one of the rooms of the First Regiment Armory.

Fire Caused No Interruption.—Although the fire at the plant of the Syracuse Aluminum and Bronze Company, Syracuse, N. Y., November 17, at one time threatened the factory with total destruction, prompt action confined the loss entirely to the office. The foundry was running in the afternoon, and the next day the entire force was at work, and has been ever since. There was practically no interruption to the business except considerable inconvenience in the office, due to loss of records, etc. All the patterns were removed to a place of safety during the fire. It has been reported that the entire plant was burned to the ground, but this was certainly not the case.

Maxwells for the Foreign Markets.—The purpose of the European trip of J. D. Maxwell, vice-president of the Maxwell-Briscoe Motor Company, is reported to be that of studying foreign trade conditions with a view of exporting Maxwell cars during 1910. After making himself conversant with the requirements of the European market, Mr. Maxwell will proceed to Mexico and South American countries, where trade conditions are favorable. In connection with this report, the fact that the Maxwell-Briscoe Company contemplates the erection of a fourth factory near San Francisco, assumes an important aspect.

Packard at Top of List.—An interesting story is told by the registration of different makes of automobiles which have been driven by tourists stooping at Summer hotels in the mountain regions. There were 1,159 automobiles at the Mount Washington garage, Bretton Woods, N. H., during the past season. Eighty-six different makes were represented. Of all these cars, 231, or 20 per cent.. were Packards. The next greatest number of cars of any one make was 126. The result of the count last year was similar, the Packard being ahead of the next make of car at Bretton Woods during the 1907 season.

Racine Auto Body Plant Enlarged.—Increased volume in its limousine, taxicab, and coupé body business, in addition to its output of the regular open types, has made it necessary for the Racine Manufacturing Company to again enlarge its plant. Two large four-story brick buildings are oow ready for occupancy, and foundations are being laid for a third one. The company is purchasing available property adjacent to the factory, with a view of further increasing its manufacturing facilities.

General Bell Buys a White.—The White Company has sold to General J. Franklin Bell, chief of staff of the War Department, a 20-horsepower limousine White steamer. Several White steamers have been owned by the War Department since 1905, and General Bell has had at his disposal the official records covering the cost of up-keep and other features of operation. In view of General Bell's recent purchase, these records were undoubtedly satisfactory.

Splitdorf Display at Paris Salon.—Conspicuous among the many exhibits of accessories at the present Paris salon de l'Automobile is the large and complete display made by C. F. Splitdorf, of 261 Walton avenue, New York City. This is the only exhibit of American ignition apparatus at the French show, and is attracting much attention. J. S. Mack, manager of the Splitdorf Broadway branch, is in charge.

IN AND ABOUT THE AGENCIES.

Franklin Agency Appointments.—The H. H. Franklin Manufacturing Company, Syracuse, N. Y., announces the following new Franklin agencies: Sherman Dils, Parkersburg, Va.; Jordan Automobile Company, Minneapolis, Minn.; Ohnhaus Automobile Company, Fort Wayne, Ind.;

Harmon Automobile Company, Portland, Me.; Sid Black Company, Cincinnati; Winnipeg Garage Company, Winnipeg, Man.; Pendleton Automobile Company, Pendleton, Ore.; Northwest Automobile Supply Company, Spokane, Wash.; Swendeman Automobile Company, Helena, Mont.; Troy Automobile Exchange, Troy, N. Y.; G. W. Hanson, Griffin, Ga.; J. B. Moore, Laconia, N. H.; D. M. Jackson, Warren, Pa.; Butte Novelty Works, Butte, Mont.; Brunn Automobile Company, 1140 Main street, Buffalo, N. Y.

Firestone Tires, St. Louis.—F. O. Sawyer, 3910 Olive street, St. Louis, one of the veterans in the trade, has disposed of his entire business to the Firestone Tire & Rubber Company, and will in future devote his attention to outside interests. The new Firestone branch will be distributing headquarters for Missouri, Oklahoma, Arkansas, Indian Territory, Kansas and Texas.

Grout, Philadelphia.—Another branch bouse has been added to the long list already established in the Quaker City—that of the Grout Automobile Company, of Orange, Mass., who have opened at 1521-23 Spring street, with Wilson H. Stoyle as manager.

Spencer Power Air Pumps, New York City.—The Auto Pump Company, makers of the Spencer pump, has opened an office in the metropolis with the Breeze Carbureter Company, 101 West Sixty-sixth street. Philip O'Neill is manager.

Palmer-Singer, Pittsburg.—The newly organized Palmer-Singer and Simplex Sales Agency, of Pittsburg, with temporary offices in the Machinery building, will represent the Palmer-Singer and Simplex cars in Pittsburg and vicinity.

Stearns, Kansas City, Mo.—The Stearns car will be represented in Kansas City by George Tebeau, the owner of the Kansas City Blues, with salesrooms at 1716 Grand avenue.

Cadillac, Des Moines, Ia.—Earl V. Shue has been appointed agent for the Cadillac car, and expects to be installed in his new quarters at 916 Walnut street very soon.

Gyroscope, Detroit.—The C. B. Fear Automobile Company, with salesrooms at 844 Woodward avenue, have taken the Detroit agency for the Bloomstrom Gyroscope car.

Oakland, New York City.—Sheppard Brothers have been appointed general sales agents for the Oakland Automobile Company.

Locomobile, Kansas City, Mo.—The Dempster Machinery Company has been made agent for the Locomobile in Kansas City.

Oldsmobile, Lexington, Ky.—The Olds Motor Works has appointed L. Hamilton, of Lexington, as agent for the Oldsmobile cars.

Oakland, Boston.—Fred S. Smith, of Columbus avenue, Boston, has taken the agency for the Oakland car.

Oakland, Pittsburg.—The Oakland cars will be represented in Pittsburg by the Bellefield Motor Company.

Marmon, Wilkinsburg, Pa.—The Marmon car will be handled in Wilkinsburg by F. A. Hunter.

PERSONAL TRADE MENTION.

F. C. Lindoerfer has resigned his position with the Oscar Lear Automobile Company, Springfield, O., and has been appointed sales and advertising manager of the Auto-Car Equipment Company, of Buffalo, N. Y. Mr. Lindoerfer is well known to the public, having been, during the past eigbt years, associated with the former Haynes-Apperson Automobile Company, and more recently with the Elmore Manufacturing Company. During the past year he has been prominently identified with the sales and advertising department of the Oscar Lear Company.

Walter A. Wood, formerly with the Oldsmobile Company, and more recently general manager and treasurer of the Cleveland Motor Car Company, has just gone with the Mora Motor Car Company to become one of Manager Burke's aides at the New York branch. Mr. Wood's extended experience in automobile selling makes him a valuable acquisition to the Mora selling forces.

William J. Baughman has resigned as superintendent of the Stanley electric plant at Pittsfield, Mass., and goes with tbe General Vehicle Company, of Long Island City, N. Y., as selling agent. His territory will be east of Rochester and north of Poughkeepsie, in New York State, and western New England.

D. W. Gluck, for some years with the Packard Motor Car Co. of New York, as salesman, has accepted a position as sales manager of Fickling & Co., which has recently leased the large seven-story building at 304 and 306 West Forty-ninth street, where several new departments will be added.

W. B. Fewell, who recently associated himself with the Olds Motor Works, Lansing, Mich., has left the Ohio field to temporarily assist Mr. Stokes, the general sales manager. Mr. Fewell will probably cover the greater portion of the United States while on this special work.

Charles Clifton, treasurer of the George N. Pierce Company, of Buffalo, sailed for Europe last week on the *Kronprinzessin Cecilie.* While absent he will look over the new models exhibited at the Paris Salon by the European manufacturers.

J. Elmer Pratt, who has been identified with the automobile industry in this country since its inception, and prior to that time a leading manufacturer of bicycles, has been appointed sales manager of the George N. Pierce Company, Buffalo, makers of Pierce Arrow cars.

J. F. Singleton, who last spring relinquished the advertising management of the Firestone Tire & Rubber Company, of Akron, O., has returned to his duties after a prolonged tour of the Firestone branches and agencies, extending from coast to coast.

C. Royce Hough, formerly factory manager of the Pope Manufacturing Co., Indianapolis, and later sales manager of the Motor Car Co., Washington, D. C., has accepted position as general manager of Fickling & Co.

D. B. Price, formerly of the New England branch of the G. & J. Tire Company, has gone with the Firestone Tire & Rubber Company, as traveling representative for the Boston branch, at 145 Columbus avenue.

Harry G. Smith, who recently resigned from the staff of the Diamond Rubber Company, is now with the Pennsylvania Rubber & Supply Company, 2134 East Ninth street, Cleveland.

D. R. Olmsted, of Council Bluffs, Ia., the inventor of the air brake for trolley cars, has applied his invention to a similar device for use on automobiles.

F. L. Sandord, of Worcester, Mass., has joined the selling force of the Boston branch of Franklin people.

NEW TRADE PUBLICATIONS.

Hoyt Elsctric Instrument Works, Penscook, N. H.—The new bulletin of the Hoyt voltammeter system of ignition testing is now out, and is about double the size of the old one. The Hoyt voltammeter is intsnded to be mounted on the dash and left continuously in the battery circuit, giving a constant reading. Both the voltmeter and ammeter windings are so calculated that the instruments do not consume any appreciable amount of current. The moving parts rest on jeweled bearings, and are extremely sensitive to changes in tbe volume or pressure of the current, but at the same time are very dead beat in action. The scale markings are uniform and easily read. The object of tbe device, as expressed by the makers, is to give the driver the same knowledge of the condition of the ignition system during the whole time that the battery circuit is closed as tbe steam engineer has of his steam supply.

White Steamers, as employed by the government and a number of cities for ambulance service, patrol wagons and buses, are fully described in a new booklet which has just been published by the White Company of Cleveland. Considerable epace is devoted to the ambulances employed by the Army and Nnvy departments, together with a number of letters from government officials, giving their opinion of the Whites for this service. The various types of White buses, as used by different hotels and for livery service, are illustrated—as well as the White steam patrols used in this country and abroad.

Willard Storage Batteries.—The Willard Storage Battery Company, of Cleveland, hae issued its catalog announcement for 1909 containing a full deecription of the etorage battery field for automobile use as covered by this company after 16 years' experience in this kind of work. The company thinks that in the newer models it has overcome the usual difficulties met with in storage batteries for automobile work, i. e., corrosion, epilled solution, and sulphating. Explanations with diagrams are given, illustrating the many uses of the storage battery.

Apperson for 1909.—Tbe 1909 catalogue announcement from ths Apperson Bros., of Kokomo, Ind., is out showing seven different models for the coming year. The new models of smaller horsepower will employ the shaft drive, while those for the 60-65-horsepower motor used in the model K and Jackrabbit, double chain will be furnished unless the purchaser desires the shaft drive, which the makere are prepared to furnish. For ths first time this company is putting out a six-cylinder rated at 60-65-horsepower.

Davis Robe Company.—In preparation for the coming cold weather automobile owners, who contemplate using their car, would not make a mistake by spending five or ten minutes in reading the announcement of the Davie Robe Company, 126 State street, Chicago. The email booklet contains full descriptions of the partially enclosed robe and the arctic over-pants made by this company, with illustrations making clear their simplicity and usefulness in all weather.

Ford Motor Cars.—This is the title of an attractive booklet just issued by the Ford Motor Company, Detroit, and it gives the long-looked-for information concerning the mechanical details of the compiete line of new Ford models for 1909. Its contents are more in the form of a running story than in the usual catalogue style, making it that much easier reading, so that before ons is aware of it he bas read tbe pamphlet from cover to cover.

About the Stearns for 1909.—An attractively embossed cover bearing the white line radiator forms the foreword to the new Stearns catalogue, and it is appropriate in that this is the same introduction that one ueually gets to the Stearns on the road, the car being easily dietinguishable in this manner as far as it can be seen. The booklet is devoted to the Stearn'e achievements on the road, as well as to a description of the new models.

Another Glidden Booklst.—The latest story of the recent A. A. A. tour has just come out in a booklet published by the R. M. Owen & Company, New York City, general sales agents for the Reo, under the title of "Two Weeks." Besides the map showing the principal cities passed through, the story is intsrspereed with scenee along the route which help materially to give a lucid and interesting idea of this famous fifteen days' contest.

Johnson Friction Clutches.—The Carlyle Johnson Machine Company, of Hartford, Conn., manufacturers of the Johnson friction clutches, marine reversing gears, etc., are using the experience gained in producing clutches for commercial work in the new model clutches for cut-off couplings for use in connection with marine motors. A

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THE AUTOMOBILE

PARIS SALON IS NOW IN SUCCESSFUL PROGRESS

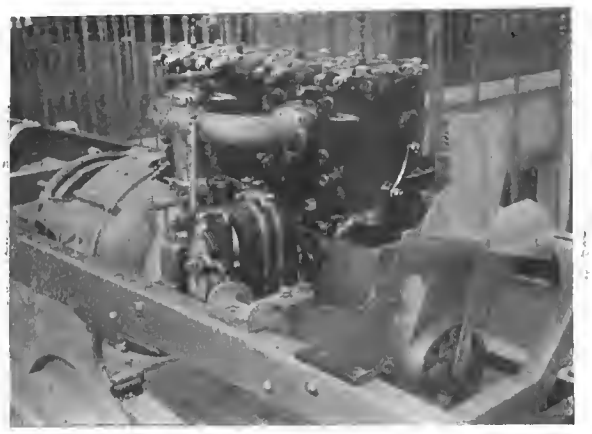
By W. F. BRADLEY.

PARIS, Nov. 28.—With the usual ceremonial, President Fallieres and his suite drove from the Elysee to the Grand Palais in an automobile, were received by a bowing group of automobile constructors responsible for the exhibition, declared the show open, and spent a couple of hours paying compliments in his hurried visit from stand to stand. It is a morning's formality that must be gone through as religiously as the morning devotion of the most pious Mohammedan, and serves to mark out the Salon from any of the common groups of exhibitions where horses or furniture or bric-à-brac are the center of attraction, and here in France precedent is much observed.

Nothing has been changed in the general lines of the exhibition, and to the newcomer it stands forth as a show of remarkable elegance and artistic design; but those who have followed up the increase of decoration, gold paint, flowers and pile carpets, at once miss that flood of electric light and that wealth of decoration that in previous years had caused the unsophisticated lady visitor to ask why they wanted cars there at all when there were so many other pretty things to be seen. Last year it was a gorgeous hall of electricity; this year it is an artistic automobile show. And it is expected that as much business will be done with a good deal less expense to those trying to do the business. Decorated stands are not essential now in selling cars.

There are nearly seven hundred exhibitors in the large hall on the banks of the Seine, which is a sufficiently high figure to prove that the boycott rumors were nothing more than rumors. The three or four firms that stood out against an annual display have as their only reward the knowledge that nobody misses them. France has more than the lion's share of the show, and naturally takes all the best positions, the locations being made by the

Arrival at the Grand Palais of the Many Exhibits for the Annual Paris Salon.



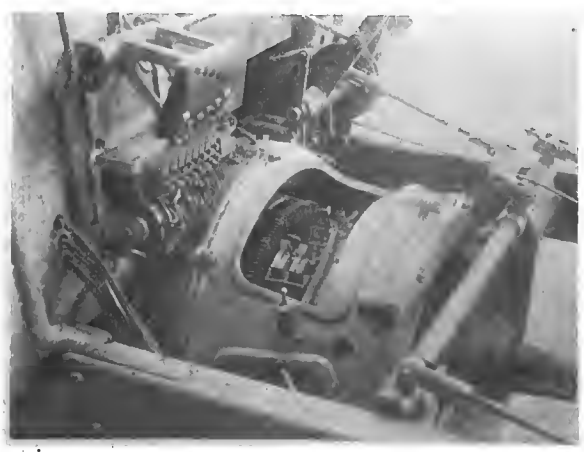
Much-Discussed Knight Engine in Gem Chassis.

drawing of lots with the important feature that only firms of a certain standing can take part in each drawing. The pioneers of the industry get the first positions; those who entered the trade later to make money out of automobiles are given a chance to draw lots according to their business standing. "It would not do to have a general drawing," declare the wise managers, for then some third-rate firm might get the center position and be unable to put up a stand that would harmonize with the decorations of the hall.

But the foreigners have not much reason to grumble at their positions, for near the center of the hall, and round the foot of the grand staircase, are grouped the gorgeous stands of Mercedes, Fiat, Benz, Minerva, Lancia, Wolseley, and Buick. The only other American automobile constructor to hold a position in the Salon is Ford, with a stand less centrally placed. In the gallery, where tires, and a thousand accessories have been given lodging room, Rushmore and Splitdorf are the two most important representatives from across the Atlantic. On the opening morning the American visitors observed around the hall were D. J. Post, of Post & Lester, Hartford, Conn; Howard E. Coffin, of the Chalmers-Detroit Company; Emile Crossman, president of the Motor Car Equipment Company; Russell Huff and H. D. Wilson, of the Packard Motor Car Company; and John L. Poole, representing the Buick interests. Those reported on the way are J. D. Maxwell, of the Maxwell-Briscoe Motor Car Company, and Roy Chapin, of the Chalmers-Detroit Company.

Nearly Every Builder Has Small Cars.

There are a few points in which the tendency of European design is noticeable from even the cursory examination of an



Generator and Control of Gem Petrol Electric.

opening-day visit. Lower-powered cars are everywhere in favor. With but an exception here and there, every constructor who has made a name in the big car class has gone into the small car field, the idea of a small car varying from a four-cylinder of 85 millimeters bore to a one-lunger of 100 millimeters. Without exception they are shaft-driven; where the cylinders are four in number they are, in nine case out of ten, cast in a single block, with valves on one side; ignition is invariably by high-tension magneto only; water circulation in most cases is by thermo-syphon, with a tendency to put the radiator on the dash—Renault fashion—when new models have been designed. On clutches and transmission there are a variety of designs; on suspension the prevailing mode is semi-elliptics in front, three-quarter elliptics in the rear, with a good deal of variety in the way of the rear springs are designed.

Low-tension ignition has received its death-blow. During an early morning run through the show not a single example of low-tension make and break could be found. It is true that a few of the cars had not got the covers off, for the President had not arrived and the doors had not been flung open to the public; but even among those hidden up were only a few of the very large models that had the simple low-tension magneto. Among the firms having changed some or all of their models from low to high-tension ignition are Brasier, Dietrich, Mercedes, Mors, Itala, Berliot and Fiat. Double ignition is very rarely seen, and in many cases no provision has been made on the engine for adding a second system as a standby.

Departures from Accepted Standards.

There are very few distinct departures from generally accepted standards of design, though of course plenty of diversity in detail methods of working out every part of the car. Air-cooling has one representative only, and even that one is not brought forth as a commercial proposition. The Henriot is an inventor's idea, and has its four cylinders with deep flanges cooled by a couple of fans placed on the right hand side of the engine and driven by bevel gear and upright spindle driven off the camshaft. The transmission is a planetary one contained within the flywheel. Another idea of the same firm was the substitution of the radiator by a dashboard tank into which a current of air was forced, circulation being by thermo-syphon.

Charles Y. Knight's patent, as modified by Panhard, Minerva and English Daimler, was undoubtedly the most attractive mechanical feature of the show, without, however, being the one that met with most praise. There are plenty of critics to point out that the engine is difficult to lubricate, that equal silence can be got with a poppet type of valve, and that its good points are obtained at the cost of complication.

Some of the most interesting mechanical work is expected in the aeroplane engine section, which will comprise a portion of the second show to be held in December.

Six-cylinder cars stand just where they were; there are a few new models, but there are some that have disappeared, and there are certain firms having found so little demand for this type of engine that they do not give it standing room this year. Single-cylinders, on the other hand, are being brought forward more and more prominently. In the majority of cases the engine is a De Dion or an Aster fitted to the builder's own chassis, though there are a few cases of large influential firms having produced a "mono," the most important being Bayard-Clement. The aim of the French constructor is to make his one-lunger look like a four-cylinder car, and with this object in view he carries his single vertical cylinder forward under a bonnet that would easily accommodate a four in two castings. In this particular feature the designer has succeeded, for it is impossible to say, from a mere outside examination, whether there are one or four power-producing units. To complete the illusion it is necessary that the exhaust should have the right sound, and though a few have cut down the noise to such an extent that the layman may be deceived, the spaced clap, clap, clap, generally betrays.

The larger firms prefer the two-cylinder model for their small-

est powers, and here are to be found Panhard, Renault, Darracq, Dietrich, Brasier, Charron, Berliet, and Bayard-Clement with two-cylinder vertical engines that in most cases can be run side by side with a four without any but an expert being able to tell, from the noise only, which is which.

About the Knight Engine.

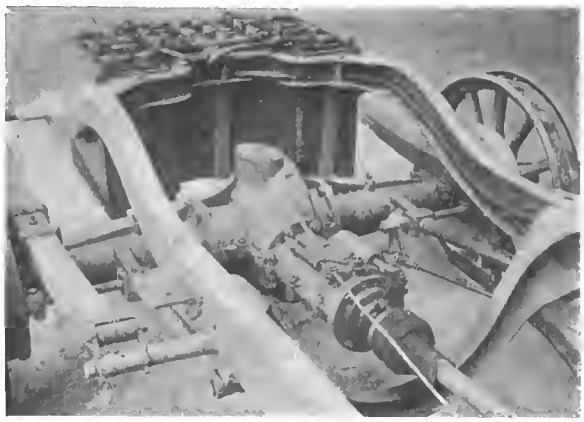
In the short space of three months Charles Y. Knight, of Chicago, has become one of the best-known figures in automobile Europe, and his special motor the most conspicuous feature of the industry. In England, where the motor has been adopted by the Daimler Company, the balance of opinion is that an excellent move has been made by securing the sliding valve engine from the West; but if the opinions were analyzed, it would doubtless be found that the satisfaction was the outcome of confidence in the wisdom of the Daimler engineers, rather than a personal conviction of the merits of the innovation.

Continental Europe is interested, but much less disturbed by the new motor, and never dreams, as is done by the Englishman, of a possible revolution of the motor industry by reason of the deal. In Belgium, Minerva has secured the rights and will adopt the motor, with their own modifications, to a certain number of their cars. Mercedes has secured the rights for Germany, but refuses to make any declaration regarding its adoption to their models. It would not be at all surprising if the patents were neglected next year. In France Panhard has the sole right to manufacture, but apparently did not consider the invention worth exclusive rates, for it is still open to a manufacturer in any other country to sell on the same territory. There will be a Panhard-Knight engine at the forthcoming Paris Salon, and in all probability a complete car—two or three have already been built for testing purposes—but it is exceedingly doubtful if any number will be put on the market. There is many an invention in the Panhard factory waiting to be fitted to cars, and it would be surprising if the American one could break down the French engineers' caution. In Italy Fiat may take over the invention, though nothing is yet definitely decided upon.

The first commercial application of the Knight engine in France is, curiously, not by Panhard, but by the Gem Company, a new corporation presided over by Leonce Girardot, one of the early French race drivers and a founder of the C. G. V. firm. Panhard having failed to secure exclusive rights, Gem has arranged with the English Daimler Company for the purchase of their engine built on the Knight patents, and will fit it to all their larger chassis during the coming season. The combination is rather an unusual one, for the Gem is a gasoline-electric of a special design, which up to the present has been driven by a standard type of gasoline motor. In view of the special claims put forth for the Knight on the grounds of silence and flexibility, and the peculiar advantages of electricity in these two respects, the Gem people believe they have secured a happy combination.

The Knight engine, with four cylinders in two groups, or nominally 38 horsepower, drives a continuous current dynamo occupying the position usually given to the flywheel. Transmission is through a magnetic clutch, and drive to the rear wheels by propeller shaft and rear live axle, a sliding gear combined with the differential housing, giving reverse. When the engine is running light the dynamo charges up the set of storage batteries carried in a special case at the rear of the chassis. When an extra effort is required from the motor, the storage batteries discharge into the dynamo, giving an additional force which may be valued at 10 horsepower for the large models.

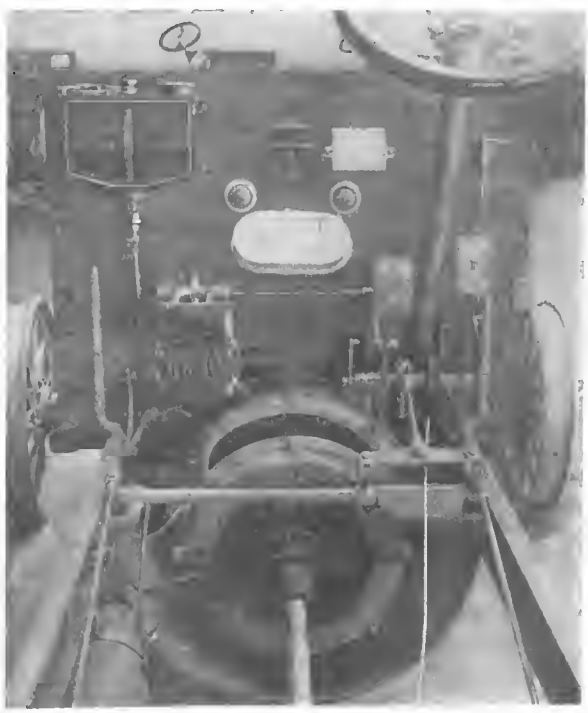
Ignition is by high-tension Bosch megneto, as on the Knight-Daimler engine. The carbureter is of a special type, entirely automatic, and magnetically controlled, the gas supply being increased as the storage batteries are brought into play, and automatically decreased when the dynamo discharges into the battery. Control therefore is as simple as that of a trolley car, and is indeed on the same principle. The left-hand lever on the steering wheel is used solely for starting the motor, by sending a current of electricity from the storage batteries into the dynamo.



Another View of Gem, Showing Batteries.

The primary set of brakes is magnetic, the reserve set being operated upon by foot pedal. All electric connections are contained in a double dashboard, in which position they are protected from damp and air. The gasoline tank, instead of being at the rear, as on the first models, is under the driver's seat, with a flow by gravity, this change having been made to give a better distribution of weight.

It is intended to put the new Gem-Knight chassis in service very shortly with the Paris General Omnibus Company, which has a monopoly of bus service in the French capital. The company is nearing the end of its lease, and whether it is renewed or given to a new body, mechanical service will be insisted upon by the city authorities. A large proportion of the horses have already given way to gasoline buses, but the company does not appear to be satisfied with the type adopted. A large company is offering to take over the entire service with a set of steamers, and those responsible for the Gem have similar intentions, believing that the combination of a flexible gasoline engine with an electric transmission will be ideal for crowded city service.



Dashboard and Dynamo of Gem Petrol Electric.

FIVE FRENCH FIRMS OUT OF GRAND PRIX?

PARIS, Dec. 3.—Paris wants to know if her crack constructors have got cold feet. There is report abroad in well-informed circles that five of the most important firms have agreed among themselves not to compete in the next Grand Prix. The matter would not be so very extraordinary were it not for the fact that the firms in question, which are declared to comprize Brasier, Renault, Panhard, and Dietrich, have each a representative on the Racing Board and are therefore boycotting their own event.

Just how much truth there is in the report it is impossible to say, but there is no doubt whatever that these firms have discussed among themselves the advisability of abstaining from racing next year. Paris is more than surprised at the move, and bluntly declares that the crack constructors have got cold feet at the idea of second-rate firms, having had long experience in the construction of small cars, coming forward and beating them at their own game. They could stand being beaten by Fiat and Mercedes, but when it is a question of Blank & Blank, voiturette builders, coming forth with a special 130 millimeter-bore racer and beating them, they would prefer to keep out of the game.

Undoubtedly next year a number of firms having never before tackled a special racer, will come forth with a Grand Prix car. There are at least half a dozen firms having specialized in 120- and 130-millimeter more touring cars who will use the knowledge gained in this line to build a trio of racers. Berliet, the winner of the Italian 130-millimeter race, will enter three cars for the first time in the French Grand Prix, the driver of one of them, in all probability, being Thery. The engines are already under construction, and are declared to have a stroke of 200 millimeters.

RULES FOR 1909 PRINCE HENRY TOUR.

BERLIN, Dec. 3.—In a conference at the Imperial Automobile Club, between the club and the industry, the regulations governing next year's contest were worked out and will be published in full during December. Of these the most important is the formula accepted by the meeting, in order to eliminate freak and racing vehicles as much as possible from the competition and give the normal touring car the chance it certainly did not enjoy in the first tour. The formula is as follows:

$N = 0.013.\ i.\ d^2\ {}^5\sqrt{s^2}.$

N being the horsepower, i the number of cylinders, d the bore in centimeters, and s the hub in centimeters. Beside this, all drivers who have neither won a cash nor art prize for themselves or the car-owner in any recognized contest (club arrangements excepted) will be credited with a certain number of points, in order to give them a more equal footing with professional drivers; this will, however, only have a bearing on the whole result, and the speed trials on the flat on the first and last days will be excluded.

The minimum weight for the weakest cars, with a capacity of 1.6 litres, is 750 kilogrammes, with a further kilogramme for each one-tenth of a litre more. The weight of the body may be less than fifteen per cent. of the whole.

At the same meeting it was decided to turn the proposed voiturette competition into an international event, only factories being allowed to enter with teams of three cars each. The date was fixed for August 29 to September 2, on the Berlin-Brunswick-Weimar-Würzburg-Heidelberg-Strasburg route.

BOSCH IGNITION FOR 1909 MERCEDES.

Editor THE AUTOMOBILE:

On page 670 of your November 12 issue, in discussing the proposed improvements on the Mercedes car for 1909, it is stated that "Ignition is by Eisemann high tension magneto."

As a result of inquiry, we have before us authentic information, proving this report printed in your publication as entirely void of foundation. We are assured that "Bosch Ignition" will, as in former years, be the standard equipment of the Mercedes 1909 car.

BOSCH MAGNETO COMPANY,
G. JAHN, Manager.

New York.

GETTING BACK AT NEW JERSEY.

NEWARK, N. J., Dec. 7.—The Newark Board of Trade and the New Jersey Automobile Trade Association have joined forces and will endeavor to combat, by means of suitable legislation, the boycott in all branches of automobile manufacturing against the State. This boycott has resulted from New Jersey's refusal to exchange courtesies with other States; that is, to recognize the licenses of all others recognizing the New Jersey license, except Pennsylvania, where a new law seems assured this Winter. Other incidental causes are the "correspondence" justices, arrests and trials before minor courts; and other annoying points of the motor law. It is asserted that this boycott is being felt throughout the State, parts manufactured to the amount of $8,000,000 being affected in Newark alone. Among the ways in which this is being felt is that car manufacturers are not placing contracts for parts in this State. Others who have existing contracts will not renew within the State. Thus, the high-handed methods are being brought home by a curtailment of business.

ANENT THE BRIARCLIFF TROPHY RACE.

NEW YORK, Dec. 7.—Several meetings have been held and several more may be necessary before the automobile manufacturers' committee will be able to agree on the plans for the stock car race which will be repeated this coming Spring. The point of discussion is the cylinder bore, each manufacturer seeming to have a different idea. The limits discussed varied from 5 inches up to 5 1-2 inches for four-cylinder motors. The advocates of the former figure had in mind barring the racers especially prepared for the international races, the rules for which limit four-cylinder motors to a bore of 5 1-8 inches. No decision has been reached, but it was decided to hold the race under the same name but at a later date, probably the first week in June. The place was not finally decided upon, for it was thought that inducements should be offered as in France. It is certain that the race will not go far from New York City.

CUBAN RACE PROJECT ALIVE AND KICKING.

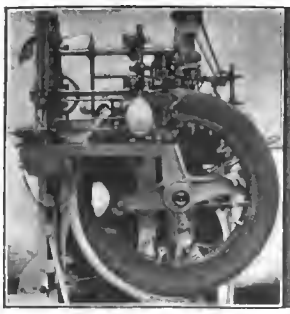
NEW YORK, Dec. 7.—The Board of Governors of the Automobile Club of America has definitely decided not to have any hand in the proposed week of speed tests near Havana, Cuba, whether these races be held or not, but prominent members may carry it through. The Cuban people are very strong for it, and the races will undoubtedly be held, not the first week in January as was originally planned, but later, possibly in March. To conduct the race, Harry T. Clinton and A. H. Whiting, of the Contest Committee, have both been secured for duties similar to what they had at Savannah.

EXPELLED THOMAS FOR RECKLESS SPEEDING.

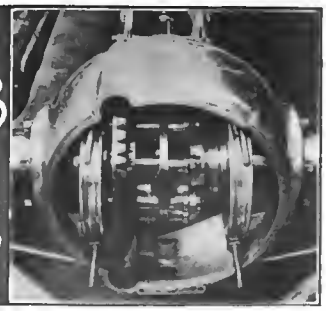
NEW YORK, Dec. 7.—At to-night's special session of the board of trustees of the New Jersey Automobile and Motor Club, E. R. Thomas, the New York banker, was summarily expelled as a result of his speeding at Long Branch on August 14 last. Testimony showed that at the time the accident happened Thomas was running his car at a rate of 80 to 90 miles per hour. Thomas was represented by counsel, who stated that he would be crippled for life as a result of the accident, but neither this fact nor counsel's strong plea for delay was given any weight. In addition to this, Thomas still has his trial on several counts by the State of New Jersey coming to him.

DAYTONA RACES SAID TO BE ASSURED.

NEW YORK, Dec. 7.—It has been finally decided that the Florida speed tests will be held next year, probably at Daytona during the last week in March. The later date was selected so as to obtain the most favorable conditions. The earlier experiences rather lead to the conclusion that this late date is wise.



Technical Observations at Olympia



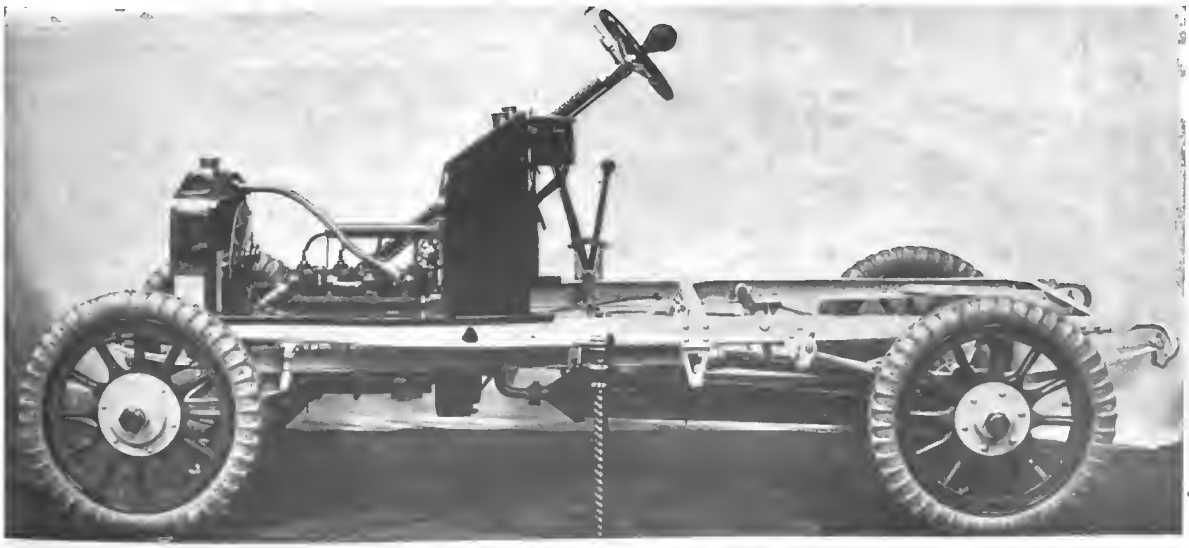
LONDON, Nov. 21.—That big section of the show which comprises the home countries' exhibits can this year fairly lay claim to showing greater extent and variety than the Continental section, which has in former years been classed first. The main feature which characterizes the British exhibits as a whole is the breaking away from the set groove of standard practice into which so many firms seemed fixed. This change has in great measure been caused by the fact that almost all the big manufacturers have now seriously taken up the medium-powered and light car, and the excellent designs which such firms have evolved have stimulated the smaller makers to fresh efforts. Not a few have succeeded in no small degree.

Some representative cars are described in detail below, but where one is mentioned there are a dozen others of equally good design, of which lack of space prevents mention.

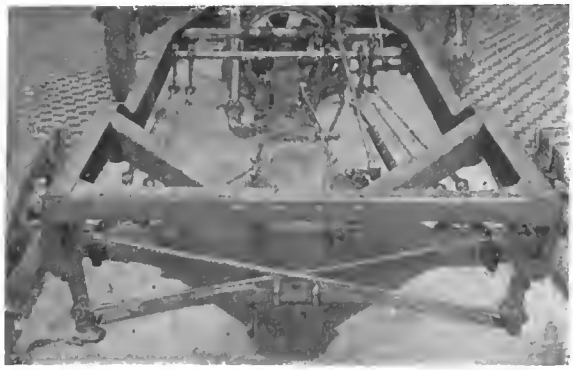
The Austin Product.—One of the most representative British stands is that of the Austin Company. Although this firm commenced operations less than three years ago, their cars have acquired a great reputation and have risen right into the first rank. The models exhibited range from 60-horsepower six-cylinder type, of which two standard chassis were run in the Grand Prix, down to the new 15-horsepower light car. The most popular vehicle—excluding the new 15-horsepower—is the 18-24-horsepower model, and of interest as showing the sound design of these cars, the particular show chassis of this power on view now appears for the third year in succession and yet is quite up to date in every detail. All the cars except the smallest have separate cylinders, and gas-engine practice is followed in that the liner is not joined on to the waterjacket at the top extremity and so is free to expand upward when the temperature is raised, while a small washer keeps the water from entering the cylinders. Bosch dual ignition is fitted, giving a special hand-operated magneto and coil for starting "on the switch" with ordinary high-tension magneto for running. A flat disc clutch conveys the power to a four-speed gearbox with direct drive on third and final transmission is by live axle, although on the big 60-horsepower car chain drive can be provided if specified.

A new form of rear suspension is fitted to the 40-horsepower and 60-horsepower cars, this permitting of the use of complete elliptic springs without the disadvantage of side play usually associated with this kind of spring. Lateral stability is obtained by taking the drive at the forward extremity of each spring and not in the center, while vertical flexibility is secured by shackling the springs together at the rear and by holding the top spring in a pivoted connection with the frame. As only the forward end of the spring is rigidly connected to the frame and the rear end is quite free, full up and down movement is allowed, while the central pivot reduces the side play to the same value as it would have been with a semi-elliptic spring of the usual form. An interesting feature of all these cars is that they are turned out from the works with full supply of tools and lamps, and even a speedometer and mileage recorder is included.

The 15-horsepower car is a new and popular type which is quite up to the level of the other Austin products. The four cylinders, size 3 1-2 by 4, are cast in one piece together with the top half of the crankcase, and the valves are on opposite sides. Natural circulation of the water is relied on, and a large honeycomb radiator being fitted, the fan belt of which is



The Unusual Nameless Chassis—New Kempshall Tires and Peculiar Muffler.



Humphris Compensating Cross Spring.

kept in tension by a controlling spring. Forced lubrication is provided, and ignition is, of course, by high-tension magneto. The leather clutch is of novel design and two failings of this type are cleverly obviated. The leather facing is divided into six loose segments, fitted on flat springs of slightly greater curvature than the cone of the flywheel. These segments can be inserted into place without disturbing the body of the clutch, the ends of the flat spring plates fitting into grooves on the circumference of the clutch casting and being secured in place by lock nuts. By having the segments in this shape easy engagement is insured, while the ease of detachment makes it a simple matter to remove the leather for occasional softening treatment. The engine and three-speed gearbox are mounted on a channel steel subframe, which is pivoted at the front to a cross girder of the main frame and fastened at the rear to another cross member by two bolts, thus giving simple three-point suspension. The gearbox is in one piece, and, instead of aluminum, cast iron of special grade is employed, the makers claiming that a stronger job can be provided with but small increase in weight. The final drive is by propellor shaft to the rear live axle and this is fitted with substantial torque rods. Ball bearings are used throughout the transmission and the brakes are of the expanding variety, exclosed from mud. The price of this car complete with five-seated body comes out at $1,750, which appears reasonable, judged by the early demand.

Talbot Has a New Clutch.—Mention of the clutch improvement on this Austin calls to mind the new cone clutch on the Talbot cars—productions which are noted on this side for high engine efficiency. These cars have a leather cone clutch in which the drive is transmitted from the coned portion to the clutch shaft by a claw coupling. When the pedal is depressed the clutch first comes out of engagement with the flywheel in the usual way, but further movement of the pedal separates the two portions of the clutch itself, so that the only revolving part which can cause scraping of the gears is the comparatively light

Rear End of the Humphris Chassis.

clutch shaft itself. On releasing the pedal, after the gears have been meshed, the reverse action takes place. In practice it is found that any gear can be meshed without the slightest noise or jar.

Napier Worm-Driven Small Cars.—This is the first year that Napiers have been seen in the light car section, new 10-horsepower and 15-horsepower models being staged. The 10-horsepower car is of the two-cylinder type and the 15-horsepower engine has four cylinders, but the other features, save as detailed below, follow standard Napier lines and the complete cars are covered by a three years' guarantee.

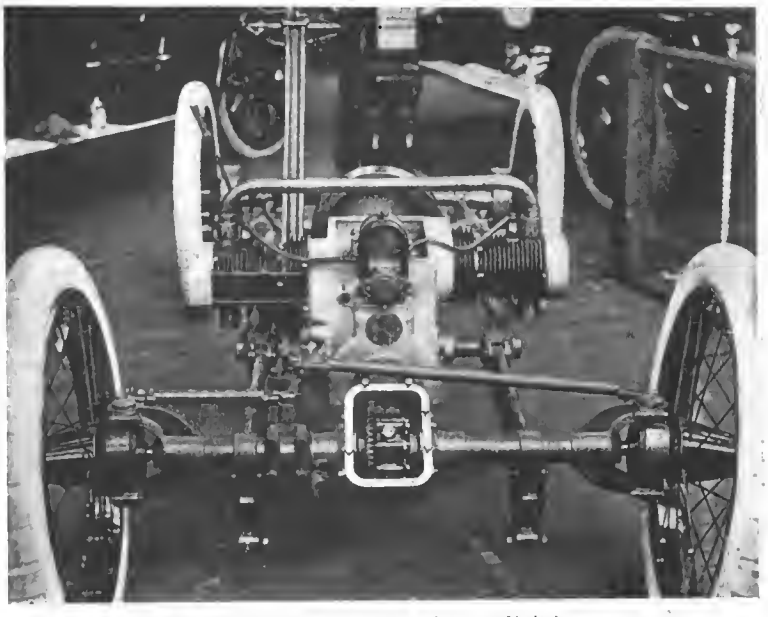
Both models have the cylinders cast in pairs, bore and stroke being 102 by 127 mm. The valves are all on one side and are enclosed from dirt by an aluminum cover plate. The ignition is effected by a Bosch high-tension magneto carried on a platform at the front of the engine. Below the magneto is the centrifugal water pump and below that again the gear oil pump. The carbureter is novel in that the mixing chamber is on top of the engine, separated by a long water heated pipe from the spray portion, which is at the level of the top of the crankcase. The reason for this construction is not altogether obvious, but the makers state that it has been found to give excellent results in practice. The disposal of the flywheel in front of the engine and the attachment of the gearbox directly to the rear of the crankcase is a step new to British—though perhaps less so to American—designers. The multiple disc clutch, with flat plates of tool steel, is enclosed in the gearbox, which gives three speeds with direct drive on top. A cast sleeve projects from the gear box to the outside of the frame and to this is bolted the gate in which the change speed lever works. Another projection at the rear of the gearbox almost completely encloses the foot brake and so protects this important part from dust and mud. Final drive is by propellor shaft and worm gearing, the driving shaft coming below the axle. This has the obvious disadvantage of reducing the road clearance so that in cars for foreign and colonial use a bevel drive is substituted. The chassis price of the 10-horsepower model is $1,475 and of the 15-horsepower $1,750. The six-cylinder engine of the same type appears in the 30-horsepower car, while above this other six-cylinder models range up to 90-horsepower.

Humber Firm Has a Full Line.—On the Humber stand all the cars are shown together without distinction of name as formerly, owing to the recent transfer of the Beeston Works to Coventry, where the firm has now the biggest motor factory in Europe. The cars shown range from the new 8-horsepower two-seater and the well-known 10-12-horsepower model, which has probably had a bigger sale than any other two European cars, to the 30-horsepower six-cylinder car. The two intermediate four-cylinder cars, the 22 and the 28-horsepower embody the results of the Tourist Trophy racing experience, as is shown by the bigger ratio of stroke to bore—90 by 140 in the first case and 100 by 150 for the other—and the large diameter of the valves, which gives very high engine speed without falling off of power. Features common to all Humber models are the absence of water pump, thermo-syphon circulation being relied on; the forced lubrication system with which is worked an indicating pointer on the dashboard, showing how much oil is circulating, and the well-designed short gearbox, in which the lay shaft and reverse pinion are idle when top direct gear is engaged.

A New Detachable Wheel.—The new 8-horsepower two-seater has engine with bore and stroke of 90 by 120, and duplicate ignition is fitted. A fan flywheel contains the flat disc clutch and the three-pced gearbox is operated by a gate change. Final drive is by propellor shaft and all brakes are of the enclosed internal expanding variety. The price of this model is $975. Examples are shown of the Humber detachable artillery wheel, which can be fitted to any of the new models. This wheel is similar to the popular Rudge Whitworth wire wheel in having an outer shell hub with slots engaging with feathers on

the inner or permanent hub attached to the axle. A neat spring locking cap, which can only be loosened by a special spanner, prevents any possibility of the wheel coming adrift.

The First English Two-Cycle Advocate.—A most interesting car is the Valveless, which has a special type of two-cycle engine. The two cylinders have a common combustion chamber and are placed so that their cranks are parallel. The two crankshafts are connected by gearing and are set so that both pistons rise and fall together. One of the crankshafts drives the magneto and the water and oil pumps, which are placed at the front of the engine, while the other crankshaft has a fly-wheel at the rear end and so transmits the power through a cone clutch to the three-speed gearbox. The final drive is by live axle and the remaining features are quite standard, excepting, perhaps, the silencer, which runs the whole length of the frame. This, the first British car with two-cycle engine, showed up well as regards fuel and petrol economy in a recent official Royal Automobile Club trial. It is somewhat interesting to note tbat at the last sbow the engine, although in action the same as now, was placed horizontally in tbe center of the frame with epicyclic gearing and single chain drive. This method of construction has had to be abandoned in deference to public opinion, which seems so hopelessly conservative where changes from standard practice are concerned. It is for the same reason that the Lancaster this year has wheel instead of its successful form of tiller steering and also that Cadillac has adopted the sliding gear.



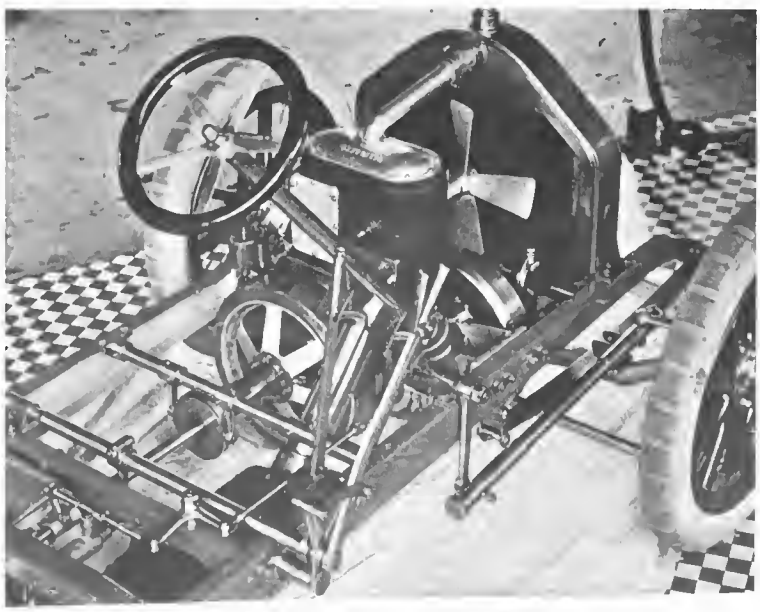
Pilgrim Front Drive, but Unlike the Christie.

All parts of the Valveless car are made to specification by a prominent engineering firm—D. Brown & Sons, of Huddersfield—and the Valveless Company has only to assemble the parts. This is an arrangement which would seem to offer big possibilities for the small maker.

The Lower-Priced Cars, the Phœnix.—Easily first in the cheapest class, which may be taken to include two-seaters listed at under $750, comes the Phœnix 8-horsepower car, which has three years' excellent performance in road trials to recommend it. The two-cylinder vertical engine, which has bore and stroke of 80 by 80 mm., is placed across the frame and has overhead inlet valves and magneto ignition. A multiple disc clutch is fitted in conjunction with a two-speed and reverse epicyclic gear running on ball bearings. From the gear the drive is taken by a single chain to tbe rear axle, which has spur type differential and full set of ball bearings. The frame is tubular, supported front and rear by semi-elliptic springs as usual. Brakes are fitted to the front wheels—and this is a point which is attracting growing attention from designers—and there are also band brakes on the rear hubs worked by a side lever.

Further refinements on this little car are the dust screen, which extends from front of the frame to the rear axle, and the provision of gauges to both petrol and oil tanks. The price for the two-seater, with tools complete, is $700.

New and Original Two-Cylinder Two-Seater.—Another interesting small car, a newcomer to the ranks, is the 8-10 Smeddle-Kennedy two-seater, which hails from Newcastle-on-Tyne. Right through the car the designers have ignored standard practice and have constructed every part with the object of simplicity and ease of adjustment by the novice. The engine has two 3 1-4-inch cylinders cast together, the piston stroke being 4 1-4 inches. The valves are of the overhead type fixed in cages and are all operated by a single overhead camshaft running in ball bearings and driven by bevel gearing from the crankshaft. This crankshaft is enclosed by a dustproof cover that can be detached, together with the camshaft gear, by undoing four wing nuts. To reset the timing it is only necessary to turn the flywheel till a mark on it lines with a pointer on the crankcase and then to see that the mark on the camshaft spindle coincides with a line on the casing. A well-designed automatic carbureter is bolted direct to the inlet ports without the use of an induction pipe. Ignition is by Nieuport high-tension magneto. In this engine, as in the Valveless, the crank



Valveless Engine, Which Attracted Attention.

K. T. Sectional Tire

throws are set so that the pistons rise and fall together, thus giving impulses at even intervals. This method is not common to British design, but should be an improvement if the balancing has due attention. The fan flywheel contains an expanding clutch and from here a long propeller shaft extends to the rear axle, a forward continuation of the latter containing the gearing which provides three speeds and reverse. The frame is of pressed steel and is stayed by four radius rods, two for each axle, which converge on a central bracket. The front of the frame is carried on an inverted elliptic spring, while at the rear are two inverted quarter elliptics, these being free to slide in boxes on the rear axle. With 760 by 90 tires and body complete, this excellent little car sells at $1,050.

The Ball-Bearing Pilgrim.—As a last example of the light cars the 9-horsepower Pilgrim may be cited. This is a very light car—700 pounds is the weight of the chassis—on new lines, which has been described as the nearest approach yet to the American buggyabout. The engine has two horizontal cylinders of size 86 by 72, with two speed epicyclic gear alongside, no separate clutch being fitted. The drive is transmitted to the front wheels through double universal joints. The engine has ball-bearing connecting rods and magneto ignition. Front wheel brakes are provided, these being operated by a foot pedal, while a side lever controls the back brakes. The price of this two-seater is $650.

The few cars here mentioned are only isolated examples of the many of all powers and types that are shown, but they may be taken as representative of the majority.

Continental Cars as Seen by British Eyes.

Reviewing some of the principal stands in order, that of the Renault is found to attract most attention, for to the average autoist these cars are representative of France, just as the Mercedes is of Germany, and as Daimler and Napier uphold the British name. No less than five four-cylinder models are made for the coming season, these being the 14 horsepower, 16 horsepower, 20 horsepower, 20-30 horsepower, and the 35-45 horsepower. Finally, the huge 50-60-horsepower six-cylinder chassis ends the list. All these, except the three smallest, are fitted with self-starting devices. The 35-45 and the 50-60 cars have the well-known Renault compressed-air system, while the others are operated from a foot pedal working through a chain and ratchet gear and so rotating the crankshaft. In all other points the cars follow 1908 design without alteration, even the cone clutch and the straight-through gear-change being the same as ever.

The most noticeable feature of the Panhard cars is the absence of chains, only the 25-35 horsepower model retaining this form of drive. The two-cylinder car with epicyclic gear has not made its appearance, but a 10-12 horsepower light car, with cylinders 80 by 120 mm., brings the Panhard firm into line with other famous constructors. In all engines the cylinders are cast separately and the crankshaft has five bearings, an elaborate force-pump lubrication system to all parts being used. A special type of magneto is fitted, in which the advance and retard positions are obtained by "rocking" the magneto. The disc type of clutch is contained in the forward part of the gearbox, which latter gives four speeds and reverse with direct drive on top. By employing smaller gear wheels of a special steel, the old humming noise which was such an inherent feature of former Panhards has been entirely overcome.

The adoption of the Knight valveless engine by this firm was not arranged sufficiently early for an example of this new type to be shown, but this will appear on the Panhard stand at the Paris show. There are, however, two Continental stands at this show—the Minerva and the De Luca Daimler—which stage cars fitted with this American invention.

The Mercedes cars remain substantially the same as for 1908 season, with the main exception that on all models the disc clutch replaces the old scroll type. The low-tension magneto works in conjunction with the special Bosch magnetic plugs, so dispensing with the moving tappets. A new multi-jet carbureter is fitted and the control levers now remain stationary, instead of moving with the wheel as before.

An Italian car, which, probably on account of its moderate price, has acquired a good popularity in this country, is the S. C. A. T. This car hails from Turin and derives its name from its designer, Ceirano, who is stated to have been responsible for the early Italian cars. The 22-horsepower model is the car which ran so consistently, although unplaced, in the Tourist Trophy race, the bore and stroke being 101 by 140. The valves are no less than 50 mm. in diameter, and as a result, very high engine speed is obtained. High-tension magneto ignition is standard, but the low-tension variety can be supplied optionally. The disc clutch four-speed gearbox and shaft drive follow customary Italian practice, the only additional feature of note being the compressed-air starting device, similar to that of the Renault. The price of this chassis is $1,750, and that of the 14-horsepower model, which has four cylinders 85 by 120, is $1,475.

The Rapid and the Bianchi cars on view follow the above standard lines almost exactly, the price, however, being higher.

Examination of the Hotchkiss exhibit reveals the fact that the famous gun firm has now given up the use of ball-bearings in the engine. The principal model is the 20-30 four-cylinder with bore and stroke of 110 by 130. The crankcase is not split in the usual way, but is in one piece, with big end plates to permit of the introduction of the crankshaft, which runs on three long phosphor bronze bearings. The carbureter is of the multi-jet type, and the float chamber is connected with the inlet pipe in such a way that the level of the liquid in the jet varies with the engine speed. The remaining details follow standard practice.

At the time of writing, toward the end of the show, which closes to-night, great satisfaction is being expressed on all sides at the good business which has been done—far exceeding expectations. Consequently, much optimism prevails.

Windham Interchangeable Body, a Taki

BENEFITS DERIVED BY HEAT TREATING STEEL*

By THOMAS J. FAY, President Society of Automobile Engineers

HARDENING through and surface hardening are quite different processes. For surface hardening the *"cementing"* process (sometimes called case-hardening) is called into play. In this process the primary consideration is that the steel shall be low in carbon. If the carbon is above 20 points, however, the results will not be satisfactory. The reason for this, as before stated, lies in the fact that the core (under the shell) will be hard and of a non-dynamic character.

Cementing can be done in the muffle furnace or in the metal salts bath; the results will be nearly the same in either case, because in cementing work the parts to be treated are placed in hermetically sealed iron boxes, completely buried in hardening powder. The result is the parts are not exposed to the uneven heat of the products of combustion in the muffle furnace, nor will sudden fluctuations of heat be imparted to the steel to be treated.

The softer the steel is (the lower the carbon) the better will be the core from the kinetic point of view. This will be especially true if the metalloids are low and the texture of the steel that is possible of attainment by the "acid" process. However soft the core may be, it will be toughened in the oil quenching and subsequent tempering process. The shell (originally, however soft the core) will take on the hardness due to cementing, and it is possible to impart to the surface of even dead soft iron, enough carbon to render the shell "glass hard."

The cementing temperature is about 900° C., as a rule, but higher temperatures will result in an increased depth of carbonizing while the hardness due to quenching will be greater for a greater difference as between the quenching bath and the temperature of the steel as it contacts with the quenching bath. Carbonizing should not be done at temperatures higher than the occasion would require and 1,000° C. would seem to be the maximum.

The time required to carbonize will depend upon the composition of the steel and the temperature. Swedish iron, very low in carbon (5 points is a fair figure) will take the longest and the highest temperature. Chrome nickel steel, with carbon at about 20 points, would probably take the least time in the carbonizing. In this latter case, too, the temperature should not go above 900° C.

The finest nickel steel products run about 10 points carbon for cementing work. With alloys the problem is one demanding more care, greater precision of temperature regulation, and finer steel. The *"hardening powder"* may be "Krupp hardening powder," for the grades of steel such as the Krupp Company, usually furnish for automobile work or the great variety of products for this purpose can be used with more or less success. One point is certain, however, the same materials should be used every time in any given shop because it is not possible to do uniform work and change the powder frequently. Of the various materials used for the purpose the following are a few:

Materials Used in Cementing Work.

If the electric furnace is available it will be a simple problem, since cyanide of potassium may be melted in the furnace and raised to the desired temperature. The pieces to be carbonized may be hung in the molten bath and left there for the requisite period of time, depending upon the composition of the steel. The formula of this compound is $K\ Cy = KCNO$. In this we have the carbon and nitrogen, the property of the latter being to increase the penetration of the carbon. It is for this reason the indiscriminate use of cyanide of potassium is not recommended by the author, in the manner as one can observe without traveling far. The steel must be low in carbon to warrant the use of this compound. Of cyanide of potassium the *"Materia Medica"* has to say as follows: "Characteristics.—White, opaque, deliquescent, crystalline mass, having the color of hydrocyanic acid, readily soluble in water, INTENSELY POISONOUS. (Semple.)—It is a matter of the greatest importance to remember the poisonous nature of this compound." The temperature of the molten bath can be about the same as for cementing with any hardening powder (or slightly less), while the time to grow the requisite depth of carbon will be a little less. The method is rapid since there will be no need to "pack" the parts to be hardened.

If bone products are to be used in the carbonizing process, they will rank, as regards their ability, in proportion to their fineness. The smaller the mesh through which the bone will go the more effective it will be as regards time shortening in the process. The coarser the bone is, the more space must be allowed around the parts in the box, for the bone, the actual weight of bone will be less since the per cent. of voids will be the greater for the coarse bone. For slower work, mixtures of bone and charcoal will serve the purpose while, to shorten the time, fine bone and charred leather will serve the purpose.

Experimenting Is Not Always Profitable.

Cyanide of potassium and common salt (sodium chloride) may be added if it is desired to increase the penetration, and the proportions of the component compounds can be varied over broad ranges. There is no need to risk experiments in a matter of this sort since very satisfactory results can be realized through the use of bone under suitable conditions. At all events, if a muffle furnace is to be used it is essential to pack the parts to be hardened in a box (cast iron) provided with a cover, so arranged as to permit of "luting" the cover with fire clay, to thoroughly seal the box. The box must be so roomy as to prevent the parts from contacting with the box.

The parts must be put in the box and the bone must be tamped in and around the parts tightly. Surfaces not to be carbonized must be protected by fire clay to an adequate depth. Warping must be aborted by avoiding any way by which the parts to be hardened will receive an uneven pressure. When all is ready the box can then go into the muffle furnace (the furnace can be up to heat) and the time of carbonizing will then count from the time that the contents of the box reaches the cementing temperature.

In the quenching of carbonized parts warping is very prone to follow, this is especially true if the metal is of a fine grain, but it is almost impossible to avoid it if the metal has been bruised in a previous forging process, or if the steel has been properly forged but not annealed before going into the cementing process. A medium grain uniform texture (not forged) steel will behave very well.

Warping is also due to unsymmetrical shapes and to the manner in which the parts are allowed to make contact with the quenching bath. Warping is also much to be dreaded in cases of high quenching temperature, and if the quenching bath is both cold and of high "specific heat," or if the property of disseminating heat is marked. Oil quenching from a low temperature then would be less likely to cause warping than water quenching from a high temperature. On the other hand, salt (sodium chloride) in the water would to a considerable extent abort the warping tendency.

Warping will generally follow if the parts to be hardened are not deftly lowered into the quenching bath, in a plane parallel to the greatest length. Tumbling the parts into the bath *en masse* is but to warp them. If the bath is of some media of a high boiling point (at the atmospheric pressure) the tendency to warping is somewhat less, since steam will not then insulate the hot surface unevenly.

Warping is due to the unequal distribution of the strains, and if the parts do not cool equally over all zones, strains will be

*Continued from page 781, "The Automobile," issue of Dec. 3.

set up in a manner unequal. Obviously, the thin portions will cool the first and the masses of metal last; any means of equalizing these tendencies will have a lasting benefit. Cam shafts, for illustration, are very prone to warp; they must go into the bath end on and quickly.

It is difficult to keep the bath from forming a layer of steam over the hot surfaces of the parts, and to avoid this the parts must be kept moving in the bath until the metal has cooled below the danger point. Gears, sprockets and other disc-like parts should be nested and clamped between soft iron plates in such a way as to perfectly expose the surfaces to be rendered hard, yet withal to prevent warping. Gears will curl if they are not thus nested, and in fine the nesting is desirable in that the number of gears that can be handled in a given time will be more.

Tempering Should Be Carefully Done.

In tempering (drawing the temper) there are two objects, viz.: (1) To render the steel dynamic (increase the kinetic ability); (2) equalize the internal strains. Even if the internal strains are below the ultimate strength of the steel (below the warping point) they will abound to a greater or less extent, at any rate, to the detriment of the parts, since from the ultimate strength must be subtracted the internal strains. This is a matter not usually well understood, but it is plain enough if it is given but a moment's thought. If the ultimate strength of the steel is equal to (a) and the internal strain in a zone is equal to (b), the remaining strength will be equal to $a-b=c$. Illuminating the internal strains will restore the original strength: $b+c=a$.

There are still a large number of points in relation to heat treatment that could, with profit, be discussed. Take for illustration the question of composition; to heat some products would be to ruin them. On one occasion the author ordered some nickel steel to be as follows:

	Per cent.	
Nickel	3.5 %	
Carbon	0.25%	
Silicon	0.20%	
Sulphur	0.04%	or within five points below.
Phosphorus	0.04%	
Manganese	0.40%	

The material came and was worked into the desired shape. The parts were then quenched from 900° C. and subsequently tempered at 250° C., with what result? It was a waste of time. It was not a waste of material, waste cannot be wasted, the parts were brittle as unannealed glass. Further investigation of the matter showed that the reliable (?) vendors of the product, furnished a *special heat* of a product that was to be better than the steel usually to be had on the open market, which special heat (when chemically investigated) proved to be as follows:

	Per cent.	
Nickel	3.05 %	
Carbon	0.42 %	
Silicon	0.28 %	far too high in nickel;
Sulphur	0.08 %	metulloids very high.
Phosphorus	1.05 %	
Manganese	0.55 %	

Why did we not subject the steel to an analysis before working it up? The requirement as the original specifications would indicate, was not the finest steel by any means; it was not supposed that any steel mill would fail to fill an order of steel of no more than moderate quality; at all events the steel would not stand for heat treatment, and that is the point.

Records of actual failures are, of course, more valuable than suggestions of how to succeed. On the other hand one does not like to brag about one's failures; the fact remains, to succeed with heat treatment it is necessary to select tbe steel, in view of the requirements. The best way, perhaps, would be to get acquainted with regular brands of steel and use them for the purpose for which they are supposed to offer advantages.

There is one other matter of the greatest importance to be mentioned ere this subject is closed out. It is known that chrome nickel steel, if it is forged after it is received from the mill, is rendered more or less hard and unmanageable. It is a fact that the vendors of the same steel can make forgings of the same material and they will be quite as soft as the round bars; why? It is a question that has puzzled most of us for many a day. We even went so far as to persuade ourselves that the mills bad a monopoly of brains.

What it looks like is a monopoly of *cupidity;* the mills do not deliver bar stock in the same shape or condition as the stock they, themselves, use in the forging process. The bars delivered are heat-treated; the stock they use is normal; result, they can make forgings that will be soft enough to machine. The effect of the heat treatment is to render the bar steel more presentable. The same treatment rends the stock of no value as forging stock.

For forging work it would be better to order steel in the normal state, and if it is to be heat treated, perform that operation upon the finished articles. It must be remembered, however, the forgings must be annealed before machining, for two reasons, viz.: (a) To render them soft for machining; (b) to abort warping in the subsequent heat treatment.

It would be possible to heat-treat with less of warping, if the parts were annealed again after machining, but this is an ultra refinement. In the annealing process, if the forgings are to be soft it will be necessary to proceed thus:

1. Apply the initial heat by means of a wood fire, to avoid any but a genteel heating of the steel until the metal is warmed up;
2. Then heat slowly and uniformly in a suitable furnace, up to the forging temperature;
3. Commence forging at once, do not allow the steel to "soak";
4. Forge continuously, until the steel reaches tbe low forging limit;
5. If tbe desired shape cannot be had by that time, heat again to the high forging limit in the same slow and even manner.
6. Continue to forge without allowing the steel to soak. Forge until the low forging limit is reached. (If necessary repeat.)
7. Allow the forgings to cool slowly in lime;
8. Anneal at temperatures between 870 and 1,000 degrees C., depending upon the composition of the steel (900° C. is the most used temperature);
9. Double anneal if the steel is persistent in its hardness.

Keep Within the Forging Limits.

The forging limits of heat will lie between 965 and 678 degrees C. The quality of the forgings will always depend upon the work put upon them. If they are not worked down to the low limit of forging the grain will be coarse and open. If the steel is heated to a point far above the high limit, the structure will tend to be crystalline. If the steel is heated unevenly and not through, the result will be a *bruised* fabric. Persistent hardness is to be dreaded, and it will follow if the steel is not properly forged. In that event, annealing will not accomplish the desired end. These fabrics are prone to hold to their habitual allotropic state and that is not the state, *alpha*. If the steel holds to the *beta* state of allotropy, it will be brittle; if, on the other hand, the *gamma allotropic* state obtains, the steel will be hard.

The higher the carbon the more is the likelihood of the steel to hold to its brittle or to its hard state. Alloy steel is the greatest offender in this connection. It is therefore a matter of skill in the light of knowledge, to succeed in rendering forgings soft to machine, after going through a forging process.

If, on the other hand, the steel is oil-treated at the mill before it is forged, there is no chance at all of being able to make the forgings soft enough to machine, commercially. If the user of steel demands the proporties of oil-treated chrome nickel steel, they must, of course, put up with the consequences. It is not then the fault of the fabricator of the same.

The normal chrome nickel steel will not look nearly so good as the same after heat treatment, and it is possible the fabricators were compelled to resort to treatment before delivery, in order to be able to sell the steel. It was not so long ago that

impossible values were demanded, (and advertised) values, in fact, only to be had if the steel was oil quenched and but partially "let down." Of course such products were difficult to machine, and if forged, even refused "*Novo Steel*" cutters, in the hands of men of much skill.

In conclusion of the subject, there is at least one other matter that should have some attention at least; that is to say, the variety of brands of steel should be limited in so far as it may be possible to do so.

If all parts of a car could be made of a single brand of steel the better would be the results, all things considered. The builders of the cars would be able to take a greater advantage of the influence of quantity in purchasing the steel; the artificers would attain a greater knowledge of the steel, and the user of the car, in each case, would have less trouble in his quest for suitable repairs.

Theoretically, it is possible to provide all the desired qualities in steel, using a single grade of the same. This is not to say the grade in question would have to be some fine and rare brand of steel; indeed, the product would have to be either a very near approach to "iron" or the ingredients placed to impart hardness would have to be anything but "carbon."

The absence of carbon, excepting as a necessity in production, (limited to a low point) would render the steel more nearly universal in its application than would be the case were the carbon present in any considerable amount. The steel could then be subjected to "heat treatment" to impart the several desired qualities, without danger of destroying the dynamic ability of the same.

In the absence of carbon it would be possible to consider alloying as a regular thing. This statement takes into account the fact that the carbon would have to be present in quantity sufficient to render the fabrication of the steel possible. The carbon could be limited to say, 0.10% (maximum), under which conditions nickel would impart excellent qualities, and chromium would be of exceeding value. Even vanadium might be an ingredient in what could be called a universal product. It will be understood, however, it is not well to have more than two alloying elements in any product on the ground that uniformity cannot be assured when the alloying process is complex. Even one alloying element is better than two, if with one element the desired qualities can be imparted to the steel.

In the long run it is the ultimate cost that limits quality. This ultimate cost takes into account the first cost of the steel, and the difficulty in manipulating and machining the same. True, it is never necessary to use steel better than the work demands, but experience so far has not rendered it possible to decide that the materials used in automobiles were better than they should be.

At all events it does look as if the end will be towards a class of steel that will lend itself to heat treatment, to impart the several desired qualities, and in this steel the chances are the carbon content will be very low indeed. It is not to the interests of the fabricators of steel to hasten this time, because the lower the carbon the quicker will the linings of the converters and the furnaces burn out, and the fabricators of steel will not advocate a process that ends in any extra cost to them. It might be argued they can charge for the extra cost, due to the high heat, in the absence of carbon; but on second thought, it is to say they cannot charge more than they do, unless the 'tariff" is increased, because they now charge on a basis of the cost of the imported article, which includes the tariff and the transportation.

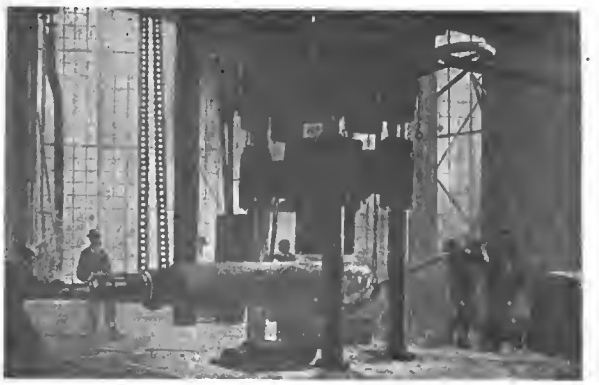


Fig. 1—Hammering process in the fabrication of steel.

Any increase in the cost would enable one to import the steel at a saving, and it goes without saying that users of steel would take advantage of a possible saving. At all events, if the builders of automobiles want steel with low carbon, they must decide for themselves as to the reasons. If low carbon is desirable, the steel so constituted can be had from abroad if not from the home mills. Since mild steel (steel with very low carbon) will stand even abuse in the heat treatment thereof, it is a good product to consider, even if alloying elements have to be introduced to impart the desired "tensility." It is the low carbon steel that has to be used if "cementing" is resorted to, and it is certainly possible to realize great dynamic ability in the absence of carbon. It is a question if dynamic ability is characteristic of any grade of steel, if the carbon content is pronounced, even though the steel be alloyed.

The claims of dynamic ability for vanadium steel, for illustration, do not hold at all, if the carbon is high; who will say it is not the absence of carbon rather than the presence of vanadium that imparts the so-called dynamic qualities? At all events, when the smoke of battle lifts, the author is of the opinion that the "old wagon maker" with his (very low carbon) iron, came very near to knowing what constituted the maximum endurance, the greatest ease of working and the uniformity so much to be desired in work of the sort under discussion.

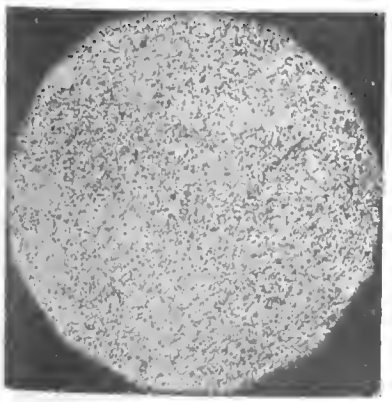


Fig. 2—Micro-photo of normal steel.

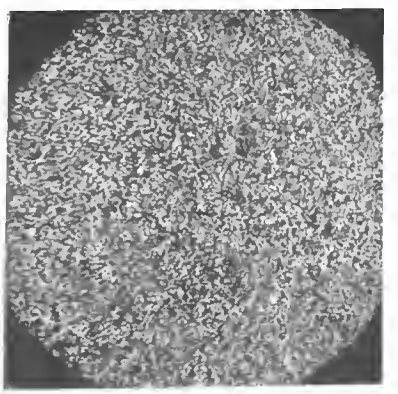


Fig. 3—Micro-photo of annealed steel.

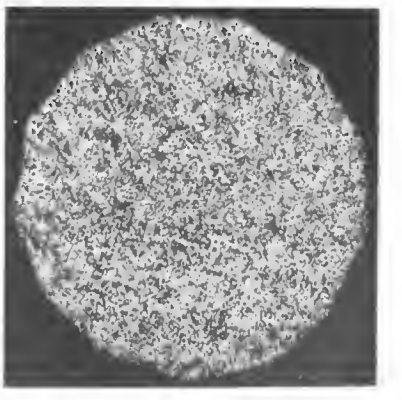


Fig. 4—Micro-photo of tempered steel.

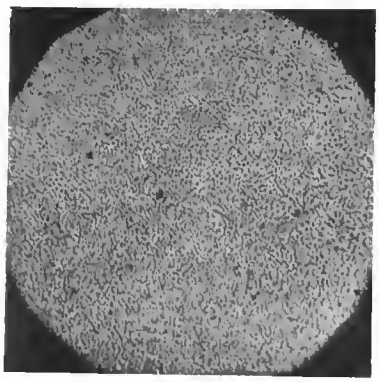


Fig. 5—Micro-photo of core of cemented steel.

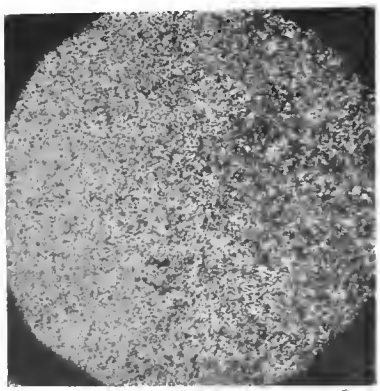


Fig. 6—Micro-photo of armor of cemented steel.

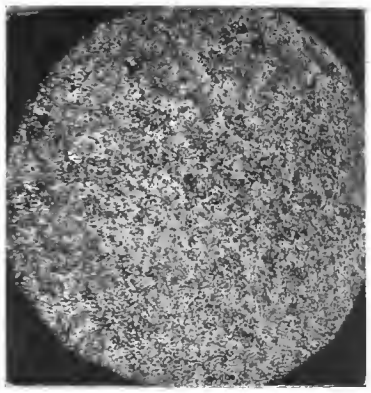


Fig. 7—Micro-photo of special treatment of steel.

The illustrations accompanying this article are micro-photographs of "Bishop" soft chrome nickel steel, and are offered with the idea of showing by means of micro-photographs that in beat treating steel does undergo structural changes, and it is reasonable to assume that the physical properties will be influenced by these changes. As a matter of fact there is a marked difference in the physical properties of the steel according as the structure is altered by the treatment, as the following tabulation will show:

Fig. 1. The properties of fabrication.

Fig. 2. Normal steel, the physical properties of which are as follows:

Tensile strength, 110,000 per square inch;
Elastic limit, 100,000 per square inch;
Elongation, 20 per cent. in 2 incbes;
Reduction of area, 60 per cent.

Fig. 3. Annealed steel, the physical properties of wbich are as follows:.

Tensile strength, 108,000 pounds per square inch;
Elastic limit, 104,000 pounds per square inch;
Elongation, 24 per cent. in 2 inches;
Reduction of area, 69 per cent.

Fig. 4. Tempered steel, the physical properties of which are as follows:

Tensile strength, 200,000 pounds per square inch;
Elastic limit, 164,000 pounds per square inch;
Elongation, 5 per cent. in 2 inches;
Reduction of arca, 25 per cent.

Fig. 5. Core of cemented steel, the physical properties of which are as follows:

Tensile strength, 222,000 pounds per square inch;
Elastic limit, 214,000 pounds per square inch;
Elongation, 12 per cent. in 2 inches;
Reduction of area, 56 per cent.

Fig. 6. Armor of cemented steel, the physical properties of which are as follows:

Tensile strength, 350,000 pounds per square inch;
Elastic limit, 290,000 pounds per square inch;
Elongation, 3 per cent. in 2 inches.
Reduction of area, nominal.

Fig. 7. Special treatment, the physical properties of which are as follows:

Tensile strength, 135,000 pounds per square inch;
Elastic limit, 120,000 pounds per square inch;
Elongation, 18 per cent. in 2 inches;
Reduction of area, 65 per cent.

Obviously this steel could only be worked in its annealed state and only then with machine tools of considerable rigidity, using high tungsten steel for the cutters. It is used for the most responsible parts in the absolutely high grade automobiles, and its presence to any considerable extent is the natural indication of high first cost.

RELATIVE ADVANTAGES OF MAGNETO AND COIL

WHILE a great deal is said about hot sparks, the "fat" kind and the other kinds, and while the claim is made that the magneto is the more efficient, the fact remains that the reasoning is generally defective. Tbe temperature of an electrical spark is fairly constant because it is the temperature due to the high resistance in the "gap" quite independent of the source of the electrical energy, be it from a battery or a magneto. The energy of the spark will depend upon the electromotive force, in the secondary circuit since,

$$W = E\,I \qquad (1)$$

in which

W = energy in watts;
E = electromotive force in volts;
I = intensity of the current in amperes.

The electromotive force can be just as high in the spark coil circuit as in the magneto circuit. It is not in tbis relation, then, that a differencc will be found in the efficiency of the methods. The actual heat dissipated in the gap at the spark plug will depend upon the actual dissipation of energy, and this in turn depends upon the length of the gaps in a given atmosphere and also the electromotive force; since the current in amperes:

$$I = \frac{E}{R} \qquad (2)$$

when,

R = resistance in ohms, or, the virtual equivalent;
I and E to be taken as in (1).

This heat, as above expressed, may be reduced to (small) calories as follows:

$$H = EIt \times 0.24 \qquad (3)$$
$$= I^2Rt \times 0.24 \qquad (4)$$

when

H = the heat equivalent in small calories:
t = time in seconds;
I, E and R to be taken as above.

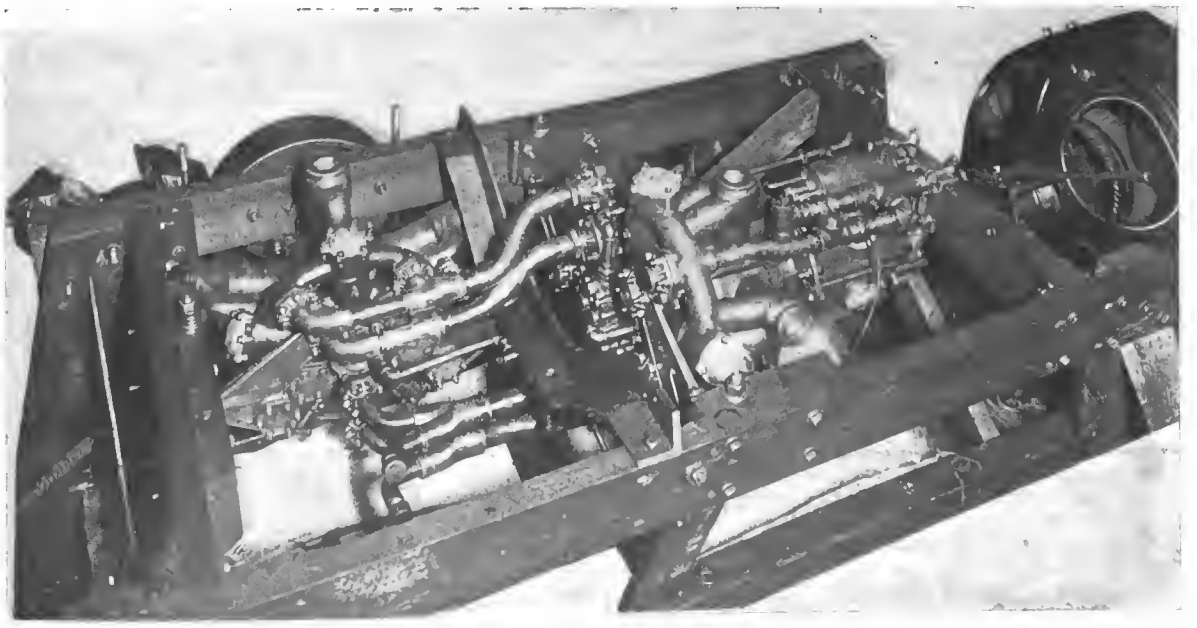
This expression is more comprehensive becausc it does take time into account, and it does deal with the heat directly, rather than the instantaneous value of the electrical energy in watts. At all events, irrespcctive of the mode of procedure, it is plain to be seen that no condition thus far shows any advantage in one mode of generating the electrical energy over the other. What is to be seen is that the spark is of equal competence.

MANLY HYDRAULIC VARIABLE SPEED TRANSMISSION

By THOS. J. FAY.

IN view of the incongruities in the sliding gear, and the limited number of speed changes in the planetary types, it is no wonder that inventors keep at it with a view to evolving some plan more in keeping with what they think ought to obtain for the purpose. The "Manly Drive," so called, belongs to the class of transmissions said to be more in keeping with the requirements, and that it is well worth looking at and pondering over is assured from its up-to-date performances. The Manly drive does work very nicely, and it does afford a most perfect control.

The system may seem to be complicated, as viewed by the novice, whereas the contrary is true. Fig. 1 shows the system as it appeared the other day when the writer was enabled to examine and run a test. Besides the test on an improved equipment of the kind, an earlier experimental type was examined in a truck where it has been doing good work for upwards of a year under a gross load of 8,500 pounds. Inventor Chas. M. Manly states the truck in question has been making the rounds in the streets of New York during this period.



Manly Hydraulic Transmission System, Showing Control and Motor.

The Reported Performance of the Truck.

Observation, during some 3,000 miles, led to the conclusion that a truck in which many speed variations could be effected would result in tire economy, and in the case in point the tires, which were 34 x 4 inches, front and rear, wore down less than 3-16 inch. The speeds available were all degrees from a slow crawl to the maximum possible in view of the highest power of the motor. In changing the speed there is no positive increment, since the result is due to the alteration in the volume of liquid (oil) that is actually pumped, or, circulated.

To change speed it is not necessary to alter the speed of the motor, and as a result the motor is allowed to run at its best power speed all the time. Power multiplied by speed is a constant, hence the ability of the power plant is not reduced under any conditions of operation. In other words, as the speed of the car is reduced, the torque of the transmission increases, if necessary, in the same ratio, and the motor is allowed to run at a constant speed. This is also true if a sliding gear is used, in so far as speed changes are taken advantage of. In the sliding gear, however, if the motor is run at a variable speed instead of sliding the gears, as is ofttimes the case, the motor ability will fall off, since the torque of a motor is not increasing with decreasing speed. The Manly drive has certain other novel features that are worth taking into account. To go into reverse, the liquid is circulated in reverse. To stop, the valves are thrown to neutral, and the system locks. Result, brakes are not necessary with this drive.

In this system the differential gear is not used at all, because two hydraulic motors are employed, one on each driving wheel, that is to say, connected therewith. The whole idea, then, consists of as many hydraulic motors as there are wheels to deliver power to and a valve system that regulates the flow of the fluid, which is ordinary mineral oil with a low congealing point and low viscosity. Plainly, the question of lubrication does not enter into the problem, and as to noise, there is very little or none, since the oil dampens all noise tendencies. The motive power is by way of an automobile motor of the internal combustion type (a gasoline motor) placed in front in the usual way, and in all respects conforming to regular standard practice. The control system consists of one lever, not counting the steering wheel for the car. The one control lever is conveniently located at the side, and by its movement all speed changes are made.

The Pressure of the Transmission Oil.

The lowest pressure is about 200 pounds per square inch, and as the speed is lowered the pressure increases. The highest pressure is about 2,400 pounds per square inch, and, as might be expected, the system of valves and the hydraulic motors which handle this wide range of pressures, must be very well designed and constructed. Fine grades of bronze are used throughout, and by an ingenious construction, as is shown in the illustration. Of leakage there seems to be very little, if any, and apparently the methods of packing are so simple and secure as to assure good performance, and no very considerable trouble from the high pressures that must, at times, obtain.

The indications thus far would seem to show an efficiency of about 85 per cent. (mechanical) of the power applied to the transmission, that per cent. being delivered to the wheels under the best conditions. This is something to take into account in slow-moving vehicle work, in which a double gear reduction would make inroads in the mechanical efficiency. If this system shows a high efficiency under the best conditions, it also does extremely well under more adverse conditions, since the liquids do not have to move so fast, and the friction losses of the liquid will be on the decrease as the other losses begin to mount up. In several ways there are compensating factors that seem to augur for good.

There is one other point to be considered before the subject is dropped, i. e., in electric automobiles it is a fact that the torque at low speeds is very high and favorable, as is generally recognized. In this system the same advantage is available, but to a more marked degree, since the motor will have a greater power rating than is usually available in electrical drives in view of the limits imposed by batteries. With motors of considerable power and the hydraulic transmission, in which the torque increases as the speed decreases, it is plain to be seen that the starting torque can be very high, indeed.

Some Factors for Commercial Success.

In commercial work it is generally well understood that the personal equation is a matter of considerable moment. "Foolproofness" has been the dream of those whose experience with commercial automobiles enables them to judge of the damage that can be inflicted on a machine by a man of just a little experience armed with a monkey-wrench and a screw-driver. In the hydraulic transmission system of the subject, the whole matter is reduced to its simplest form, in that the man (so armed) will be defeated, for he cannot find a use for the tools. Everything is housed in, the parts are simple and strong, and they cannot be the victims of dirt and grit, and they are profusely lubricated.

The Manly drive will be exploited by the Manly Drive Company, Whitehall building, New York City, and its future performance will be watched with considerable interest.

MICHIGAN'S PROGRESS IN ROADS BUILDING.

LANSING, MICH., Dec. 5.—The annual report of the Michigan Highway Commissioner, which will shortly be made to the Governor, will show that during the three and one-half years just passed, the period of the present incumbent's term of office, 326 miles of new road—macadam and gravel—have been built. This is believed to be a better showing than any other State in the Union can make. These roads have been inspected and their construction supervised by the highway department at a cost of less than 1 per cent. Of the total mileage completed, 153 miles are macadam roads, 140 miles gravel, 3.6 miles are of stone bottom with gravel top, 2.5 miles gravel bottom and stone top, and 1 mile of low-grade gravel road.

The commissioner states that the larger part of the applications that come in for State aid are for gravel roads instead of macadam. He states that he has been trying to induce road districts to put in gravel instead of macadam, as the former are not only cheaper, but are not worn so much by automobiles as are the macadem roads. The State has paid during this period $228,215 as awards in assisting in building new roads.

NEW ORLEANS TO HAVE TAXICABS.

NEW ORLEANS, Dec. 5.—New Orleans is to have taxicabs, being the first city in the South to have them. Announcement was recently made of the formation of the New Orleans Taxicab Company. Application has been made for a charter, and the company expects to be in full operation by January 1 with part of its taxicabs running by December 15.

The new company, which was organized by W. E. Woodward, of New York, and who is identified with similar companies in New York, Boston, and three other cities, is capitalized at $200,000. One hundred taxicabs will be operated.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows and Meetings.

Dec. 31-Jan. 7..—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reeves, General Manager, 29 West 42d St.

Jan. 5.....—New York City, Fourth Annual Meeting Society of Automobile Engineers. (Will adjourn until January 19 after opening session.)

Jan. 16-23.....—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. M. L. Downs, Secretary, 7 West 42d St., New York City.

Jan. 25-30.....—Detroit, Light Guard Armory, Seventh Annual Automobile Show, Tri-State Automobile Dealers' Association.

Jan. 27-Feb. 3..—Philadelphia, Second Regiment Armory, Eighth Annual Show, Philadelphia Automobile Trade Association.

Feb. 6-13.....—Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. S. A. Miles, Manager, 7 East 42d St., New York.

Feb. 15-20.....—St. Louis, Mo., Annual Show, St. Louis Dealers and Manufacturing Association.

Feb. 15-20.....—Detroit, Wayne Pavilion, Annual Show, Detroit Automobile Dealers' Association.

Feb. 15-20.....—Cleveland, First Regiment Armory, Annual Show, Cleveland Automobile Dealers' Company.

Mar. 6-13.....—Boston, Mechanics Building, Seventh Annual Automobile Show, Boston Automobile Dealers' Association. Chester I. Campbell, Manager, 5 Park Square.

Mar. 27-Apr. 3..—Pittsburg, Duquesne Garden, Automobile Show, Pittsburg Automobile Dealers' Association.

Races, Hill-Climbs, Etc.

Dec. 8.....—Worcester, Mass., 200-Mile Endurance Run of the Worcester Automobile Club.

Jan. 1-2.....—Philadelphia, Two-day New Year's Run of the Quaker City Motor Club.

FOREIGN.

Shows.

Nov. 28-Dec. 13.—Paris, Eleventh Annual Salon de l'Automobile, Grand Palais, Automobile Club of France (Pleasure Vehicles, etc.).

Dec. 20-28.....—London, Stanley Show, Agricultural Hall.

Dec. 22-29.....—Paris, Eleventh Annual Salon de l'Automobile. (Commercial Vehicles, etc.).

CARRIAGE CO. TO MAKE COMMERCIAL CARS.

YORK, PA., Dec. 5.—A new feature is in evidence for York's automobile industry. The Martin Carriage Company, one of the largest manufacturing establishments of the vehicle in the State, will in the near future begin the manufacture of gasoline commercial motor wagons. Such a move has long been contemplated, but never completely launched until recently, when by unanimous vote of the officers of the company the work was authorized. The new line will consist of all vehicles used in the commercial world for delivery and transfer purposes and will be equipped with engines made for the Martin company by another concern.

It is the opinion of the officers of the company that gasoline or electric motive power is destined to take the place of horses in the commercial world, especially in the larger cities. In expressing their views the officers stated that the automobile will not displace the horse in the country for a long time.

ANTI-AUTO LAW WILL STAND.

OTTAWA, Dec. 1.—According to the report of the committee of the Privy Council, approved by the Governor-General of Canada, the anti-automobile act passed at the last session of the Prince Edward Island Legislature has been declared within the power of the provincial Legislature to enact. A copy of the report has been sent to Lieut.-Gov. McKinnon at Charlottetown.

LETTERS INTERESTING AND INSTRUCTIVE

IMPORTANT DETAILS OF DESIGN IN CYLINDERS.

Editor THE AUTOMOBILE:

[1,664.]—Esing a subscriber, I would like to know the advantage claimed for cylinders cast in pairs ovsr cylinders cast singly, or in one block. Pleass explain the auxiliary exhaust. Also please state which is the best, a small compression space (that is, a high compression) or a larger compression space, or moderate compression. Ths reason I ask is that if ths compression is high, ths spark would jump with mors difficulty than under low compression. Also, if the compression is weaker, it would take less energy to again comprsss the gas. On ths other hand, a high compression is more powsrful; so please tell me and givs reason which is best.

Tiffin, Ohio. C. L.

If cylinders are cast in pairs the intake and exhaust manifolds will be more simple, and the crankshaft will be of the three-bearing kind. If the cylinders are cast *en bloc* a two-bearing crankshaft can be used, and the intake and exhaust manifolds will be the most simple. Auxiliary exhaust ports are by way of a better scavenging of the cylinders. In relation to the compression, it is better to have the same neither very high, nor especially low. Modern sparking equipment is capable of delivering a spark under the most severe conditions possible to impose, so that there is no trouble from that point of view. If the compression is too high, the motor will "knock" under certain conditions, as on a grade, if it is long. On the other hand, if the compression is low the power will be low as well; possibly the compression might be about 80 pounds per square inch absolute. Preignition will follow if the compression is in near proximity to 95 pounds per square inch. With a lower compression, when the cylinders become carbonized, if they do, preignition will be eminent. Within certain limits the power does not seem to be affected by changes in compression. In relation to this phase of the question, there is the speed to be considered: the higher the compression the faster will the motor run, all other conditions agreeable. In fine, it seems out of the question to arbitrarily settle the question, since the details of design will influence the situation.

METRIC THREADS FOR PLUGS GIVE TROUBLE.

Editor THE AUTOMOBILE:

[1,665.]—In ths course of work which I am doing I found it necessary to tap a cast iron bushing with a thread in ordsr to fit a metric spark plug. I started to do this work on a lathe, but found it was a peculiarly odd number of threads, and I could not definitely decide how many threads thers were to the inch. If you can, without inconvenience, give me this information; or, better yet, inform me where I can secure a tap for a day or so; I will be very much indebted to you.

Schenectady, N. Y. F. C. BARTON.

A millimeter thread gauge will enable you to ascertain the metric pitch of the threads in question. The metric pitch of threads is not one to be handled in English equivalents. If you consider that in the metric system you have a certain number of threads per centimeter, in your case, you can then proceed as follows:

As, 1 inch : 1 centimeter :: 1 : 0.393704;

With this information at hand, if you have a lathe such as will enable you to make the changes, reduce the motion of the screw to conform to the above proportion. If you can introduce into the screw-cutting train two gears, one of 50 teeth and the other of 127, it will be possible to do the work, for the reason that

As, .3937 : 1 :: 50 : 127;

There will be a slight error in the proportions as given, but it will cause no trouble at all. What you probably want is an 18 millimeter French tap for the work you have to do. If you cannot get one from your supply man, the next best thing will be to proceed as above. Perhaps one of the Metropolitan importers of foreign cars can help you.

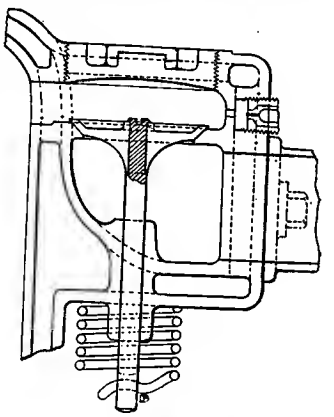
VALUE INTEGRAL STEMS OF MUSHROOM VALVES.

Editor THE AUTOMOBILE:

[1,666.]—I have a motor in which ths valves are mads of two parts, i. e., high nickel steel mushrooms with inssrted carbon steel stems. Evsrything seems to be all right excepting that occasionally a stem drops out of ths mushroom and ths consequences ars hardly necessary to describs. At all svents, I am curious to know why the stsms depart from the mushroom.

Nsw York City. XYZ.

In the majority of cases the troubles related are conspicuous for their absence. The process indicates a percentage of this sort of trouble, because the high temperature on the exhaust side at any rate, will introduce variable conditions of expansion, since the metal of the stem and of the head is not identical, and again, it is impossible for machinists to invariably attain the same degree of tightness of the fit. It is customary in this class of work to "rivet over" in the manner as shown in the illustration here given. The expectation from which may be briefly stated as follows: The static pull of the spring is, say, 42 pounds, which spring is made 2 inches in diameter and 5 wraps of a 3-16 inch diameter wire. If the shock imparted to the sheer section of the riveted over portion is equal to the static pull, then the shearing moment on the riveted over section will be 84 pounds. The riveted over section will stand 99 pounds in this particular case; if the work is as well done as the section drawing indicates, but the difference between 84 pounds initial shearing impetus and 99 pounds actual shearing ability is not sufficient to compensate for inequalities in degrees of perfection of the workmanship in practice.



Section Through Mushroom.

THE INVENTIVE MIND WORKS, ANYWAY.

Editor THE AUTOMOBILE:

[1,667.]—I am doing a lifs sentencs for murder—it has an ugly sound—but it was only a rude duel. I have been in prison sincs Octobsr 13, 1900, and during the whole time I have made automobils construction a study. Of the sevsral devices I have invented is one I send you, and hope you will find merit in it and do something by way of helping me procure a patent on the same. It is a ball and socket stsering hub.

Maclester, Okla. ORRIN DE LOSS.

Your communication shows a disposition on your part to try to do too many things at one time. You cannot be a success at automobiles, flying machines and other things besides. With so much time on your hands you should be able to make a success of some one thing.

SEVERAL FEATURES OF DESIGN TO CONSIDER.

Editor THE AUTOMOBILE:

[1,668.]—Any information you can give ms on the following will bs greatly appreciated:

1. What is ths rim insids diameter of a tirs 36 by 4 inches, and a tirs 34 by 4 inches?

2. Is there any reason for not making the front springs of a car level or flat? The only cars I can find with flat springs are the Thomas taxicabs and the 1909 Lozier. The makers who use front springs with the greatest curve make the rear ones flat, or very nearly so. Why? Are full elliptic springs with scroll at each end suitable for a touring car weighing about 3,000 pounds empty?

I have noticed that some makers attach full elliptics to the frame rigidly, while others use a kind of pivot. Which would you advise using?

3. Can you tell me whsre I can get a few small plunger pumps, cam operated? I have watched your advertising columns for nearly two months and have hsen unable to find any one who makes them.

4. Can you tell me the address of the MacAdamite Company, of Brooklyn, N. Y.? They make castings similar to aluminum.

5. Do you think that a multiple disc clutch having phosphor bronze discs with cork ineerts ksyed to the flywheel and steel discs keyed to the driven shaft, will work well? What would be the smallset diameter possible? Numher of discs? About what spring pressure for clutch of a 50-60-horsepower two-cycle motor? MORTON E. MYERS.

New York City.

(1) Depends upon the tires to be used; consult the tiremakers.

(2) Flat springs are more flexible. Some designers avoid flexibility in front; they can do so with safety since the load is nearly constant, consisting of the motor, etc. Rear springs, if flat, will be very flexible, and a preference for flexibility is expressed by many autoists. Full elliptic (scroll) springs seem to give very good satisfaction on the cars so provided; it is experience that counts. There is no objection to the rigid connection; 3,000 pounds would not be excessive for the springs made for the load. The rigid connection eliminates a joint; grit gets into joints.

(3) The makers of force-feed oil systems probably make the kind of pumps you want; the sizes might be too small. Try them.

(4) Address the United States McAdamite Metal Company, Rapelye street, Brooklyn, N. Y.

(5) It was not so long ago that the question of multiple disc clutches was discussed in THE AUTOMOBILE, and reference was made to "cork inserts." When it comes to specific designs, to consult the makers of clutches will be the safest way. See THE AUTOMOBILE, page 569, October 22, 1908. The spring pressure for a clutch to use on a 50-60-horsepower motor would have to be determined considering the clutch.

DOES NOT DEPEND SO MUCH ON DIMENSIONS.

Editor THE AUTOMOBILE:

[1,669.]—Which motor is the best, taking for granted they are the same, except the bore and stroke: One motor weighs 265 pounds, hore 4¼ inches, stroke 4½ inches, and claimed to develop 12-horsepower. Another one is 5-inch bore and 4-inch stroke, also claimed to develop 12-horsepower (both at 1,000 r. p. m.); weight 225 pounds. Inlet valvee 1¼ inch, exhaust 1½ inch on the first motor, and 1 11-16-inch inlet valves and 1 11-16-inch exhaust valvee on the last motor. Which do you consider the hest, and which will last the longer? SUBSCRIBER.

Galva, Ill.

Of two motors, the best will be the one of the most harmonious design, suitable materials and accuracy of construction. At a distance, these matters cannot be passed upon. In general, the largest piston displacement is the most likely to deliver the rated power, if the design is confined to relations within the known quantities. On the other hand, the motor with the largest bore, with, say, a crankshaft of inferior material, might be a very bad selection.

THE KNOCK IS IN ONE CYLINDER ONLY.

Editor THE AUTOMOBILE:

[1,670.]—In my Maxwell two-cylinder touring car there is a decided knock in the left cylinder only. All bearings and connections are in good shape. It has been suggested that a loose fitting piston may be the cause. Will you kindly suggest the proper remedy, if there is one short of replacement?

Spartanburg, S. C. W. B. W. HOWE, A.M.

If the timer is out of order the knock will be due to that fact. Possibly one cylinder has been fed an excess of lubricating oil and as a result a growth of carbon is there to make itself felt. If the knock was not always present, it is not likely that a loose piston is the answer. If the valve settings have become deranged, it is something to take into account. Then, again, it is just possible that the water circulation around the head of the knocking side is in bad shape.

CASTOR OIL ADVOCATES COME TO THE FRONT.

Editor THE AUTOMOBILE:

[1,671.]—On page 703 of your issue, Novemher 19, you havs a heading, "Castor Oil Lubrication Will Grow." Being from the "tall timher," I would like to get some information in regard to castor oil lubrication. If it is better than mineral oil, why is it hetter, cost not considered? OSMOND H. BARRINGER.

Charlotte, N. C.

Thus far castor oil has been limited in its use to the fastest racing cars abroad, from all accounts. Its excessive cost would bar it from general use.

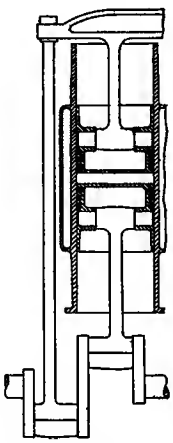
LOST MOTION IN SOLID BUSHINGS.

Editor THE AUTOMOBILE:

[1,672.]—Please tell me if hy cutting through the main hesrings of my crankshaft with a hack saw, and then introducing shims, to make up for the difference, would I not be making the hearings (nearly) as good as new? WOULD-BE SUBSCRIBER.

South Braintree, Mass.

Depends upon how well the work is done, and, further, upon the extent to which you scrape the surfaces to a fit.



Two-Piston Motor.

THE GOBRON-BRILLIE MOTOR.

Editor THE AUTOMOBILE:

[1,673.]—In your answer to the "Question Mark," letter No. 1,651, you have apparently confused the old Gohron-Brillie motor with some of the more recent creations which inventors are endeavoring to foist upon us. The Gohron-Brillie hae two separats pistons in each cylinder which work in opposite directions, the explosion taking place hetween them. The pistons are connected to cranks at 180 degrees to each other. Ths cylinders are cast in pairs, and the pistons in each pair work together; the upper piston connecting rods are joined together hy a beam across the top. The drawing shows the arrangement more plainly than any description. The advantage claimed for this construction is the more rapid expansion of ths gas, allowing a larger proportion of its energy to be utilized. G. H. GODLEY.

Cambridge, Mass.

Drawing in No. 1651 referred to illustrated the double piston as requested.

WELL-PUT RÉSUMÉ OF THE CHAIN SITUATION.

Editor THE AUTOMOBILE:

[1,674.]—I read with interest the remarks of Mr. Fergusson, quoted in The Automobile of November 26. He states: "Two tendencies in construction stand out prominently above all others. The first is the wide adoption of the shaft drive among the makers who have heretofore produced none but chain-drivsn cars * * *."

In discussing the general tendencies shown at the motor car show in London, the "Autocar" states: "The chain drive is still very far from dead, and now that eilent chains are hsing used, there is no doubt that much is yet to be said for it, particularly in the case of the large heavy bodied cars. This is, of course, on the assumption that the chains are properly enclossd in oil-tight chain cases, which, by the way, in some inetances, by means of their framework or otherwise, are made to do their duty as radius rods. Almost all the makers who have had long experience with chain and chainless cars still believe most emphatically in the chsin drive; at any rate, for the larger types, on account of its flexibility and the reduction of the unsprung load upon the rear tires."

I think that the above quotation shows clearly that thers has not heen a wide adoption of the shaft drive among maksrs who have heretofore produced none but chain-driven cars.

New York City. JOHN JAY IDE.

AN INVENTOR LOOKING FOR BACKING.

Editor THE AUTOMOBILE:

[1,675.]—I have invented improvements in automobiles which will revolutionize the industry. I have no capital. Can yon tell me how to realize for myself as well as for others, or shall I let them die a natural death? You know the old maxim: "A hurnt child dreade the fire." FRANK HUTCHISON.

Herndon, Va.

Death never yet overtook a principle. If you think you have something revolutionary, push it and generate a revolution.

The Leader of the Gaeth for '09 is Type XX, Illustration of which is Herewith Given.

RECOGNIZING the extent to which the automobile trade will flourish under the conditions at present reflected for the coming year, the Gaeth Automobile Company, of Cleveland, has completed preparations and routine such as will enable it to cope with the situation. Realizing the importance of the commercial situation, it has brought the delivery wagon question to a decided state of perfection, and the Gaeth line will therefore include four cars besides a delivery wagon; namely, Type XX, which is a modernization of the former Type XV; a new short couple body, the Gaeth tourabout, which replaces the Gaeth roadster of 1908 fame, and a limousine. The Gaeth products as above scheduled can very well be described as follows, in view of the standardized power plant and the conventional chassis of well and favorably known characteristics.

The Power Plant.—Referring to Fig. 1, it is to note the exhaust side of the motor, showing the magneto nested in an accessible position, taking its power from a housed-in driving shaft. The exhaust manifold of very liberal area, easy curves, and getatable holding bolts, is clearly shown. The aluminum crankcase flares out to the chassis frame, thus eliminating the need of an under pan, while at the same time adding strength to the crankcase itself. Fig. 2, of the other side of the motor, brings into view the carbureter, intake, valve motion, and the details of the air fan. In both illustrations of the motor, the water piping is shown of very liberal area, emanating from the top of the cylinders, and so designed as to positively eliminate steam pockets. The cylinders are cast in pairs, with integral water jackets of a selected grade of gray cast iron, and so designed as to facilitate cooling by the thermo-syphon system, in which a honeycomb type of radiator is employed. The cylinder flanging to the aluminum crankcase is of the most substantial sort, and provision has been made to assure the positive setting of cores, perfectly uniform wall thicknesses, and ease of cleaning, with a view to the complete removal of core, sand, etc.

Details of Ignition, Cam Shaft and Timing.—The low tension make and break system of ignition is used, which will permit of starting on the spark. It is a simple and efficient mechanism (Fig. 3), and displaces storage batteries, spark coils, commutators, and complicated wiring. The device consists of a single vertical shaft, rising up at right side of motor between the cylinders. Attached to the base of the shaft is a spiral gear, meshing into and driven by a similar gear attached to the intake valve cam shaft with a key, which admits of sliding the gear back and forth along the shaft. A two-piece bronze sleeve is fastened over the cam shaft and bears in a groove in the end of the sliding gear. This sleeve is connected with the spark lever on the steering wheel, and by a movement of the lever the sleeve and gear are slid along the shaft and produce the advancing or retarding spark by changing the relative rotation of the two shafts. To the top of the vertical shaft is attached a pair of small cranks, connected to which—in a horizontal posi-

Fig. 1.—Exhaust side of motor, showing magneto.

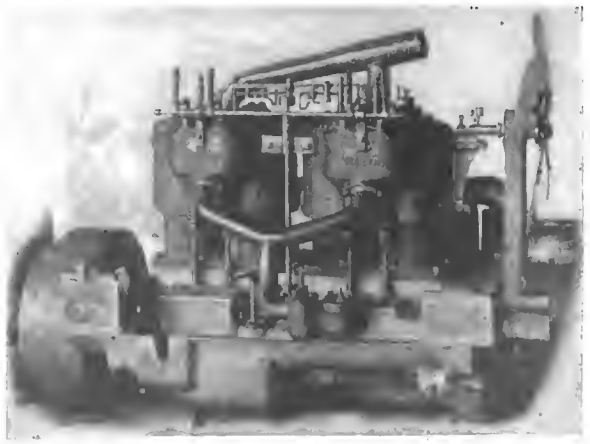


Fig. 2.—Carbureter side of the Gaeth motor.

Top of Motor, Showing Make and Break Ignition System.

tion—are four push rods, whose action trips the contact arm of the igniter. This tripping action, and thus the timing of the engine also, is regulated by means of four small eccentrics, against which the rods are held by springs. The igniter has a moving member or contact arm, which is brought into contact by means of the horizontal push rods, with a stationary insulated member connected with a Simms-Bosch magneto. Following the making of contact or closing of the circuit, a spring throws back the contact arm, and the circuit being thus broken, a heavy spark is induced between the special alloy points of each member.

Carbureter.—The Gaeth carbureter has a remarkably low fuel consumption and produces the highest efficiency of the motor. It has a three-fold control by a single movement of a one-piece throttle. The air entering from below, the gasoline entering, and the mixture passing to the motor are all controlled simultaneously by the lever on the steering wheel. The carbureter is of the separate float chamber style, and its mixing chamber is a vertical cylindrical space completely filled by a revolving needle valve and throttle. This throttle has in its base two radial "V"-shaped openings for regulating the air entrance. In its sides there is an opening of a peculiar shape for recovering the exit of the mixture. A part revolution of this throttle also effects a part movement of the needle in the nozzle, so that with a larger entrance there is a greater flow of gasoline. No auxiliary air valves are used, and it is possible to set the gasoline valve for a low running speed and go up to the highest speed without further regulating.

Features of Clutch and Transmission.—The Gaeth clutch is a study in simplicity, and belongs to the contracting band genera in which a flange cast integral with the flywheel affords the friction surface, over which the leather-faced band contracts in obedience to the pressure applied to a foot pedal. From the clutch to the sliding gear is a short and substantial drive, while the sliding gear itself affords three forward speeds and reverse, taking advantage of the progressive system. The speed change lever is fitted with an automatic position finder, and eliminates any chance of "shooting by." The gears are thus protected even in the hands of a clumsy operator. From the transmission gear to the live rear axle the propeller shaft is normally without angularity, and the universal joints are protected from dust. The rear axle itself is of the floating type, with ball-bearing wheels mounted on the axle casing.

Some Pertinent Chassis Features.—The chassis frame is a conventional channel section of pressed steel, adequate in point of strength, free from any offset. This frame is suspended on semi-elliptic springs, front and rear, of silico-manganese steel, taking advantage of the requisite number of comparatively thin leaves or plates, hence the springs are long, flat, and flexible. They are enormously strong for the work, and the periodicity of the body oscillations is fixed within the limits that assure easy riding qualities. The spring linkages and other chassis frame details are in accord with the refined design in general.

The steering gear is of the nut and screw type, designed to be irreversible. A dustproof housing is provided, and the working members are submerged in grease. The steering wheel is without lost motion, and after long service such lost motion as may be due to legitimate wear can be eliminated by the adjustments afforded.

The Gaeth Products Commercially.—The types of bodies as prevously mentioned are all the most appropriate, considering the respective classes of service for which they are intended. With a view to more clearly indicate the general appearance of the Gaeth the preceding illustration on page 819 shows among other things a large-diameter steering wheel in nice relation to the driver's seat. Also a utility wind shield, and mud guards that serve the purpose extremely well, indeed. It will be noticed that the cooler is on the center line of the front axle, and the acetylene lamps are set back sufficiently far to be protected. It will also be noticed that the side levers are straight, and in many other respects the appropriateness of the type stands out.

The road performance of the Gaeth chassis will be that due to 114-inch wheelbase and a 56-inch tread. The control of the power has been adequately enlarged upon, but mention should be made of very capable brakes of the external and internal characteristics, located on the rear wheels. The power losses are reduced to the minimum due to the fact that ball bearings are used at all points entitled to such consideration, including the front and rear wheels, so that the greater portion of the motor rated at 30 to 40 horsepower is delivered to the point of tire contact with the ground. That the motor is conservatively rated is borne out by the fact that the cylinders are 4 7-8 inches x 5 inches bore and stroke, respectively.

Type K Delivery Wagon.—In this case the body has a merchandise platform 44 inches wide and 67 inches long, with a clear head room of 56 inches. The wheelbase is 103 inches, thus assuring short turning radius in congested streets; a 56-inch tread will track in the street car tracks, and the front wheels are 34 inches, with 38-inch rear wheels, assuring good road performance. The single-cylinder motor is rated at 12 to 15 horsepower, belongs to the water-cooled thermo-syphon type, and is provided with a jump spark ignition, positive float feed carbureter, positive force feed oiling, and the transmission is by a planetary gear to a side chain drive. The capacity of this delivery wagon is 2,000 pounds. The frame is angle steel on semi-elliptical springs, and the equipment consists of oil side lamps and a tool sack.

WESTERN FARMERS ARE BUYING AUTOS.

According to the publicity department of the H. H. Franklin Manufacturing Company, the extent to which the automobile is being recognized as a necessity on the farms of the West is indicated by the fact that in central Kansas alone more than six hundred cars are owned by farmers. A dozen years ago the farmer in this region who owned an extra team and had a spring wagon had the standing of a man of means in his community. Now those who then looked covetously upon the spring wagon are driving about in automobiles. Orders for at least 100 of the gasoline vehicles for spring delivery have been placed in Kansas City and Topeka, it is estimated, and the tendency of the buyers, according to the Franklin spokesman, is to favor an air-cooled car, for the reason that the alkali in the water available acts as a destructive agent upon the metal with which it comes into contact in a water-cooled engine.

Kansas roadways are so level that they are a standing invitation to the automobilist, and this has contributed largely to the welcome given the automobile by those who live in the State. So keenly is the automobile felt to be an agricultural essential that agitation has been started both in Kansas and Missouri to have instruction given at the State agricultural colleges in the general uses and adaptabilities of the motor car. The agricultural school of Iowa at Amee has already decided to have a short winter course of instruction of this sort. The students will as a preliminary be taught the structure and operation of gasoline engines and will learn the many ways in which such an engine can be made use of to make farming easier and more profitable. Then they will be instructed in the dismantling, rebuilding and operation of motor cars so that they may become skilled operators of such vehicles, which, the State educational authorities are convinced, will perform a large part in the development of the farming interests in the next two decades.

NEW CORBIN MAKES ITS BOW FOR 1909

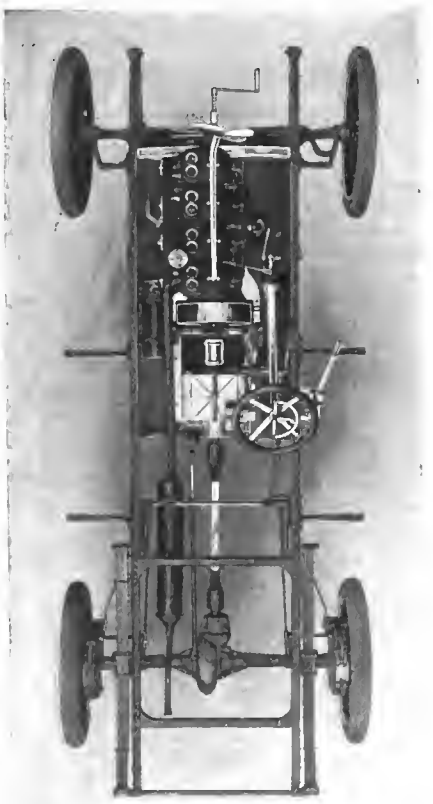
By CHARLES B. HAYWARD.

NEW BRITAIN, Conn., Dec. 7.—Things are humming at the Corbin factory these days, for the first series of the water-cooled representative of the Corbin line for the coming season are now coming through. This is known as Model K-2 30-horsepower Corbin and as a touring car, roadster, or with a baby tonneau, it will list at $2,500. It will also be made as a seven-passenger car with an increased wheelbase, and in limousine and landaulet types. When compared with its predecessor of a year ago, there is not a great deal of change in either the design or construction to be found, although in appearance the car is much better proportioned, and, to put it in more popular parlance, much more "snappy" than last year's model. At first sight, the motor appears to be substantially the same as that employed on last year's car, although an examination of its specifications reveals advances of importance in several particulars. The cylinder dimensions are 4 1-2-inch bore by 4 1-4-inch stroke, and the cylinders themselves are cast separately, the valves all being placed on the same side. The valve-operating mechanism is of the direct-thrust type, the cams bearing against roller end levers which are pivoted in outboard bearings, thus eliminating all side thrust in the valve action.

Some Striking Motor Details.—The timer projects above the tops of the cylinders and is perfectly easy of access; this is certainly a well-considered detail. The water piping is free from hose joints, yet, even so, the shape is such as to lend the desired "give." The exhaust manifold sweeps back with no decided bend at any point, hence heating, locally, will be entirely avoided. Moreover, the back pressure, due to bends, will be eliminated. The openings to the crankcase are large (really large enough to enable one to get at the bearings), and the means for securing the cover, while of the "quick detach" principle, lends security as well.

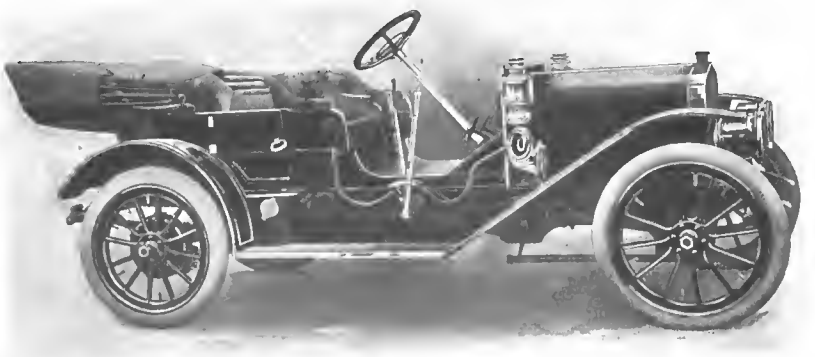
Drain cocks in the lower half are set at the right level, hence the amount of oil to put into the crankcase may be determined with certainty. The flywheel is marked to aid in correct timing; this is positively a good idea not always carried out. Indeed, there are a lot of good details on the Corbin, and the rope drive for the fan, for illustration, can be viewed with favor. It would be to overlook the things that autoists dream about to make no mention of the get-at-ableness of the holding bolts of the manifolds, cylinders, and the lock nuts everywhere provided. The motor arm supports are big enough and strong, thanks to the foresight of real designers, who seem to know where to put the metal.

A somewhat unusual practice is to be found in the method of supporting the crankshaft. The central main bearings, as well as those of the camshaft, are of the plain type, while the end bearings of the crankshaft are F. & S. annular ball bearings of liberal size. Another innovation consists of the adoption of a water-jacketed carbureter, this being of Schebler make, which is too familiar to require any extended description. The inlet manifold is led between two of the cylinders, the carbureter being placed on the non-operating side of the motor, thus making it much more accessible for examination and adjustment, at the same time keeping the valve side of the motor as free as possible. The ignition system consists of the usual four-unit coil equipment, mounted on the dash and relying upon a set of storage cells as the source of current supply, and this essential of the Corbin has been improved by the adoption of the new Connecticut timer, which is a considerable step in advance of former practice in this line. The timer is placed vertically between the third and fourth cylinders and is driven by bevel gearing from the camshaft.

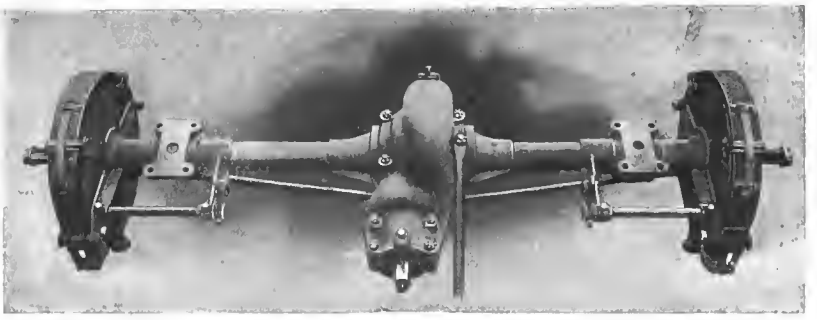


Looking Down on the Chassis.

Cooling and Other Considerations.—Cooling is by means of a gear-driven pump, circulating the water through a honey-comb type of radiator, which, while still of the same design as last year, has been somewhat enlarged, this tending to improve the general lines of the car, besides adding to the efficiency of the motor. A further improvement of the motor itself consists in the employment of an aluminum housing to protect the fiber and bronze half-time gears at the forward end, while the motor is further protected from beneath by the employment of the lower half of the crankcase as the bearing support, this being extended rearward to enclose the flywheel as well. Bolted directly to this light aluminum alloy casting is a second of similar material forming the lower half of the housing and bearing support of gear-set.



Control Side Showing Front of Cooler on Axle Center.



Rear Axle, Showing Means for Keeping Brakes from Dragging.

The design of the clutch has been improved with a view to decreasing the amount of leverage necessary to disengage it, and this has been achieved to an extent where the clutch is extremely free acting, thus making the car one that can easily be handled by a lady. Three engaging springs hold the clutch, while its thrust is taken on a ball-bearing. Springs have also been inserted under the leather facing to make the engagement easy and positive. Taken all in all, the Corbin clutch represents an excellent example of standard practice in the shape of the leather-faced cone, which is at once simple and very reliable. Due to the method of bolting, the motor base and the support of the gear-set together, making practically a unit power-plant, only an Oldham coupling is employed between the clutch and sliding gear. This is carried on a splined shaft, instead of the usual square section. F. & S. ball-bearings are employed on the ends of the clutch disengaging fork and contribute not a little to its easy action.

To return to the motor for a moment, it may be mentioned that, following what has come to be approved standard practice in this respect, nothing but the sight feeds of the lubricating system are now to be seen on the dash, the oiler itself being located to one side of the motor and well to the rear, almost under the footboards. The oil tank holds one gallon, and its contents are fed to a small positively-driven gear pump run off an extension of the water pump shaft, which raises the oil through a four-way header to the sight feeds on the dash, from which it is distributed to the main bearings. To further facilitate lubrication, the crankshaft is drilled.

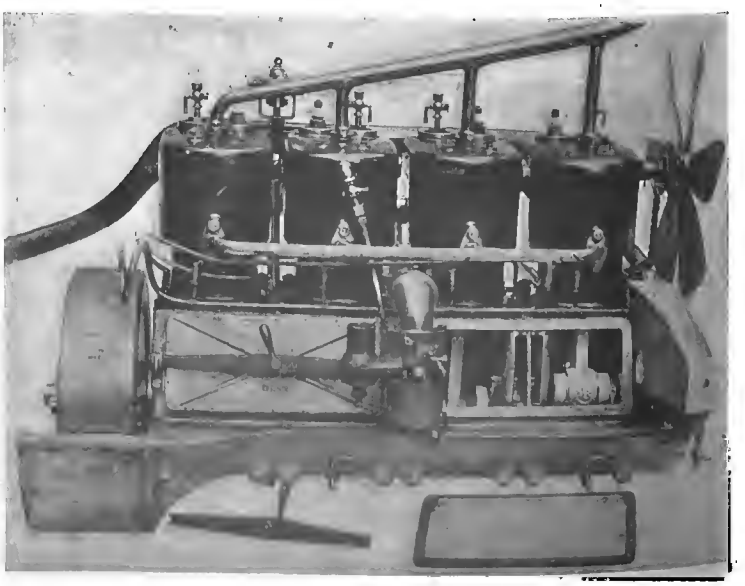
Transmission Gear Features.—The gear-set is of compact and light design and provides three forward speeds and reverse, selectively operated. All the gears are of high-grade steel, carefully case-hardened and ground. They are supported on F. & S. annular ball-bearings, the slide bars and their operating levers all being contained within the housing, thus protecting them and insuring ample lubrication. Final drive is by propeller shaft, two Hartford universals being employed, while the rear axle is of the semi-floating type with a spur gear differential. The driving shafts are made of nickel steel, heat-treated and are mounted directly upon annular ball-bearings, the thrust being taken by a special ball-bearing. The driving pinion itself is mounted on three annular bearings, one in front of it and two behind, a thrust bearing also being provided here as well. Instead of employing two sets of brakes of the internal expanding type, as in last year's model, the outer, or emergency brake, is now of the contracting band type.

While the brake drums are large and the faces of the bands ample, even so the detail of keeping the outside bands from dragging is looked after suitably. This improvement consists of three flat springs spaced equidistant around the periphery, held in rigid relations by arms, and so adjusted as to maintain the correct clearance at every point. The service brake is of the internal expanding type and is operated by cams; either is capable of locking the wheels without being set to anything like the limit of its capacity. The entire brake-operating mechanism is kept within the frame, both set of brakes being equalized by yokes. Castellated nuts locked by cotter pins are used throughout this part of the car, as well as on every other essential where a positive lock is required.

Things the Buyers Want to Know.—The wheel base of the car is 108 inches and the tread standard, in the case of the roadster, baby-tonneau, and five-passenger touring types, a 114-inch wheel base being employed on the seven-passenger touring car, the limousine and landaulet, or other closed cars of large size. The front axle is a one-piece drop-forging of I-beam section, and with the exception of the placing of the cross-steering rod to the rear, instead of before the axle as previously, has not been altered. The frame is of the usual channel section, pressed steel construction, and the steering gear is of the worm-and-sector type, neither of these having undergone any change. Suspension is by means of semi-elliptic springs all round.

The Model R air-cooled Corbin car will be continued for 1909 with practically no change whatever in the motor, which is the result of several years' study on the part of its designers, while where the chassis of the car itself is concerned, the same changes and improvement that have been recorded in the case of the Model K-2 will be carried out. The Corbin air-cooled motor is too familiar to call for any extended description.

In general, the Corbin line seems an advance on what has gone before, in spite of the previous high standard set by the designers of this product. Just what the advance means to purchasers of cars, is not so easy to put into dollars, since it is the aggregate of small things that in the long run end in the most annoyance. In the Corbin cars for 1909 the little things were brought up to a high state of perfection, and in many cases so simplified as to assure entire freedom from "mosquito" annoyances. While it is true that the main members in a car should be absolutely right, yet even so it is these members that are at first attended to. It is the little things, then, that will always stand further attention.



Carbureter Side of Engine, Showing Crankcase Openings.

THE art of driving an automobile is at once both easy and difficult, simple or complex, depending altogether from what standpoint the subject is looked upon. If driving means nothing more than steering and controlling the car on a smooth road bed the subject is certainly an easy one, quickly mastered.

But if the art of driving is taken in the full, clear sense of the word, there is much to learn, because in this latter definition is not only meant the actual guiding and control of the car, but the entire future up-keep or maintenance of the machine.

The automobile, with its delicate, sensitive, and finely adjusted mechanism, demands good care and constant attention to keep it in prime working condition, and, if neglected, we may be certain that trouble and annoyance will follow. Little things are often of greater importance than those of larger size, and as the automobile is a creature of many parts, it is the attention given to the "details" that spells success in motor handling.

It is not the writer's intention, however, to give in this article "a compendium of motor lore," but rather to mention some of the important points which ought to be considered by all autoists. Although these hints are written with the idea of helping the owner of a first car, it is possible that the more experienced "mile eater" may find at least something worth the reading.

"Cranking" with the Left Hand.

It has long been a mystery to the writer why autoists almost universally use the right hand for cranking the motor. As gasoline motors revolve like the hands of a watch—from right to left—there is always a possibility of injuring the hand or wrist should a back-fire occur when cranking with the right hand. And, again, the position which the body must assume when the right hand is used is awkward in the extreme and being twisted around that more force may be exerted, the balance of the body is not at all secure.

Back-pressure accidents may be averted by employing the left hand, and while makers of the Darracq and other cars have for several years advised the adoption of left-hand cranking, operators have always been slow to accept this good advice. The advantages of employing the left hand for starting purposes are many, and, once tried, will surely be adopted.

In left-hand cranking, the autoist stands squarely in front of his car, the right hand having a firm grip on the radiator or dumb iron. The handle is grasped firmly, but loosely, with the fingers of the left hand curved around the handle. As the feet are placed widely apart, a good balance of the body is assured, and, if a back-fire should occur, the elbow is not cramped, as is the case in the right-hand method, but the hand is thrown outward and upward, the loose grip permitting the fingers to fly open, and all risk of injury is done away with.

More force may also be given, as the right hand on the radiator materially assists the other member to turn the motor over quickly and without undue effort. Now that the low-tension system of ignition is becoming quite generally used, quick cranking is necessary for a start, and the use of the left hand will, after a single trial, convince any driver that it is the safest and easiest way to crank.

Attention to Clutch Lubrication.

It is astonishing how little care many operators give to the clutch operating mechanism, which gear is, for obvious reasons, one of the most important parts of the whole car. That the several parts of the clutch at all times should be well lubricated is self-evident, as this mechanism is in almost constant use in throwing in and out the speed gears. In some makes of cars using clutches of the multiple-disc type, the mechanism is enclosed in oil-tight cases, in which case the lubrication of the clutch collars and connecting lever is automatically performed.

But in many cars using the cone clutch, and in every case where the clutch does not run in an oil bath, oiling must be done by hand. In this case, the joints of the clutch pedal, its bearings and pins, clutch rack and pinion, clutch collar (where same slides on its shaft), brass shoe of collar and thrust bearings should be kept clean and well supplied with oil.

Concerning Grease Lubricators.

The matter of proper grease lubrication is not always given the careful and systematic attention which the subject deserves. In fact, many drivers who give regular and painstaking attention to the engine transmission and running gear, all too often neglect to give the grease cups the same careful and thorough consideration.

Grease lubricators do not, of course, require as frequent attention as other oiling points, but they should always receive their share of attention in proportion to the work such parts are called upon to perform.

Do not be content with a superficial glance or take for granted that because you screw down the cap, the grease must necessarily feed to the bearing it is intended to lubricate. This applies especially to the lubricators on the steering pins, which should not only be kept well filled and given a daily turn or two, but the autoist should know that these vital parts are well lubricated. Lubrication means much to an automobile.

It is always a good plan to refill and screw down the cup until the lubricant is seen to ooze out of the steering socket. In this case the autoist is positive that the steering gear is well taken care of and that no trouble will be caused by insufficient lubrication of these parts.

On most cars grease cups are used to supply the lubricant—light grease—to the following parts: steering knuckles, steering cross tube, steering reach rod, shaft of water pump, commutator shaft, clutch shifting collar, journal of transmission sleeve, front and back hubs.

Adjusting the Spark Coil.

To properly adjust the coil is not, as many suppose, a difficult matter, but, on the contrary, is a simple operation when once it

is understood. In most coils only two adjustments are necessary, and anyone should be able to make them in a comparatively short time.

To adjust a coil, shut off the gasoline and turn the motor over by hand until the timer makes a contact with the coil needing adjusting; then turn on the switch. Next loosen the set nut until the adjusting thumb screw can be turned with the thumb and finger, and with a fine-cut file—a thin manicure file is just the thing—remove any deposit that has collected on the platinum contact points. This done, turn the screw to the right until the vibrator commences to buzz, then lock it by means of the lock or set nut.

In case the adjustment is still imperfect, the trouble will likely be found in the vibrator spring. This spring may be adjusted by first loosening the lock nut, as before described, and turn the adjusting screw to the right, or until there is a space approximately one thirty-second of an inch between the platinum points, when the armature is pressed down and against the core. Lock in position by the set nut on adjusting screw (this lock nut has a right-hand thread). Now loosen the set nut on the vibrator block and turn the adjusting screw (the upper screw in both instances) until a light contact is established between the points—then lock in position.

A light tension between the platinum points is desirable, as a stiff tension not only renders the coil less responsive, but will exhaust the batteries quicker and often causes the contact points to become pitted.

The only secret of keeping a coil in the best condition is to fool with it as little as possible and to keep the vibrator points clean and smooth, and to adjust these points neither too tight nor loose, but at a medium tension. The vibrator spring should be fairly flexible and buzz at a moderately high pitch.

Once properly adjusted, the coil should require very little attention. Once a week the vibrator and coil plates should be cleaned with a small camel's hair brush.

Grinding the Inlet and Exhaust Valves.

No matter what make of car you may have, it will be found necessary to grind the inlet and exhaust valves occasionally, and just how often this should be done must largely depend upon the amount of running.

When the motor begins to lose power and falls off to a noticeable extent, it is a pretty good indication of three things: faulty carburetion, improper ignition or poor compression. The latter two causes are by far the most common, and if the electrical plant has been examined and found satisfactory, the trouble clearly points to bad compression.

In case the compression seems to decrease, it is probably due to the inlet or exhaust valves sticking or not properly seating themselves, hence the leakage. The cause is due to the lubricating oil carbonizing by the extreme heat generated within the cylinder, and the remedy is to remove this crust or sooty deposit.

To find out whether there is need of grinding, the valves should be lifted out, and if not bright—as they should be—but black, pitted, or streaked with soot, there is certainly a leakage of gas, and tbey must be ground.

That a thorough job may be done, it is best first to take off both inlet and exhaust pipes, which enables one to clean out the valve seats and openings, and also prevents the possibility of any particle of the grinding mixture being sucked into the cylinder.

To Insure an Excellent Job.

To prevent any of this from falling into the cylinder while grinding the valve, a small piece of waste is tied to a length of strong string and jammed into the cylinder. If any of the mixture should happen to fall off the valve, the waste catches it, and when the grinding is done may be drawn out with the waste by means of the string.

For grinding purposes, carborundum, ground glass, and emery are all quite commonly employed, my preference being for the latter. In any case, only a finely ground cutting medium should be used, as coarse emery will cut too deep and make the valve seats rough. Emery known as 120 is the most satisfactory for this purpose.

Don't make the mistake of using too much emery; only a very small quantity is required. A convenient way is to put a very small amount of emery in a small saucer and add a spoonful or two of kerosenc (don't use gasoline) to make a thin, watery paste. A few drops of lubricating oil sbould then be added to give the mixture a little more body.

Remember that a few grains of emery and plenty of kerosene and cylinder oil will not only do a smoother job, but do it much quicker than a thick emery paste. When the waste is in place, put a small quantity of the grinding mixture on the bevel face of the valve and by means of a screw-driver (blade in slot of valve) carefully grind the valve by rotating it in its own seat in the cylinder.

Don't turn the valve in one direction only, but lift it out of its seat frequently, and turn it first one way, then another. The reason for lifting it clear of the seat is to prevent any foreign substance which may get into the emery from injuring and scoring the seat or valve. No greater force than is necessary to rotate the valve in its seat need be used, and by frequently lifting the valve and reversing the grinding motion, the face and seat will be uniformly ground.

Ten minutes grinding should be sufficient to properly seat a valve which is in fair condition, but a badly pitted valve will need longer grinding to make it clean and bright. When completed the valve should be removed from the cylinder, thoroughly washed with kerosene, and the valve seat wiped out perfectly clean.

Keeping Cylinders Clean.

That your car may at all times run smoothly and powerfully, it is highly important to keep the inside of the cylinders clean. There is no excuse for letting this part of your motor become foul—it is rank negligence and nothing else—and if you allow the cylinder and piston-head to become encrusted with carbon, is it any wonder that your engine knocks and pounds and loses power?

The writer has overhauled many a car brought in because of lost power, repeated knocking, etc., and upon taking the engine down, the cylinders were invariably found to be in a foul condition. In some cases, the piston-heads were so choked with this deposit that it seemed incredible that any self-respecting motor would consent to run under such conditions.

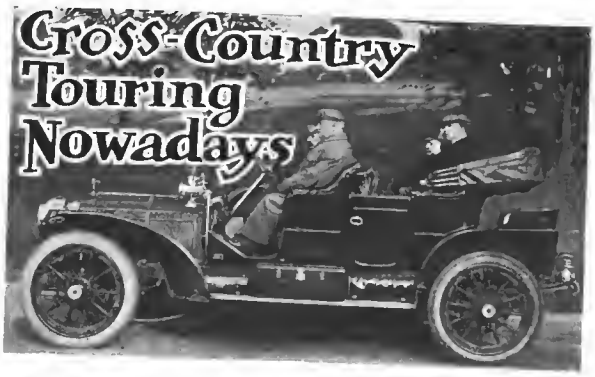
The cause of this sooty state is, of course, the oil used for lubricating the cylinders, and while all oils contain some carbon, those grades having a low fire test will obviously foul the cylinders much quicker. As the temperature within the cylinder is some 1,000 degrees Fahrenheit, it must be evident to all that a low-test oil will be entirely burned up and consumed before it can fulfill its mission of lubrication. It, therefore, stands to reason that only a high-grade gas-cylinder oil should be used in the cylinders, and such an oil will have a flash point of some 450 degrees Fahrenheit.

Never Neglect Cylinders for Extended Period.

The autoist should never allow the cylinders of his motor to become carbonized to any extent, but frequently flush them out. This may be easily done as follows:

Unscrew spark plugs, and place pistons at the outer end of the stroke, or at the outer dead center as per marks on your flywheel. Now fill the cylinders—through the spark plug holes—with kerosene and let it remain overnight. The next morning open the pet cocks in crankcase, or, better yet, unscrew them, and drain out the dirty kerosene. This done, replace pet cocks, start the motor, and open the pet cocks to blow out any deposit that may remain in the cylinders.

Cylinders should be cleaned in this manner at least twice a month—every week will be better—and if this is done often, no considerable deposit of carbonized oil will accumulate, and the car will always run at its best, smoothly, and at its rated power.



ONE of the recent Chicago to New York and return tourists was George T. Robie, of the Excelsior Supply Company, Chicago. The trip from Chicago to New York was comparatively uneventful, with roads in very fair condition.

The return trip began with a start from New York City at about noon and a leisurely run to Poughkeepsie for the night. Next day the Catskill country was enjoyed, with a luncheon stop at Saratoga, which was reached via Albany. The severe hills and the rough roads made the journey a trying one, but the Continental tires stood the test apparently without a scar, though, according to Mr. Robie, the day's run exacted harder service than would a thousand miles of ordinary travel. The Chicago to New York journey had been accomplished on a set of 1908 model Continentals that had already seen considerable service. Before starting the return a front tire was replaced with an AC type flat tread and both rear wheels were fitted with the new flat tread type course. The car was a close-coupled Packard.

Mr. Robie recites the remainder of the trip in these words: "After lunching at Saratoga, we continued our trip northward to Lake George, a distance of about thirty miles. Arriving there, we, like the youth who bore the banner with the strange device, were emphatically warned against attempting to proceed any further that night. We, however, continued, and though this warning was repeated at various points where we stopped to inquire the road, we added another twenty-five miles to the day's run, finally landing at Schroon Lake, a beautiful spot in the Adirondack Mountains. Here we put in for the night, after enjoying a feast of venison chops that left us too full for utterance. The next morning we returned to Saratoga and thence by way of Schenectady to Syracuse, arriving there at 6:30 P.M. A part of the next morning was spent visiting the University and at 10:00 A.M. we started for Buffalo by way of Auburn, Geneva, Canandaigua and Rochester. At Rochester we were held up between three and four hours by rain, but finally lighted our lamps and started for Buffalo, arriving at 9 P.M.

"Leaving Buffalo the next morning at 10:30 o'clock, we lunched at Ashtabula, and arrived at Cleveland at 5:30 P.M., where our friends evinced marked Missouri tendencies and we had to 'show them' that we had been able to cover the distance within seven hours. We left Cleveland next morning at 8:30, and traveled by way of Belleville to Kendalville, Ind. Kendalville was the one hoodoo town on the route, and here we experienced our first tire trouble of any sort whatsoever. We found that the valve of the remaining original tire, that is, the one not removed at New York, was leaking and the tire had gone flat. Being equipped with Continental demountable rims, it was easier to change tires than bother with the valve, so we removed this tire, replacing it with our spare.

"This was, however, not to be all of our troubles at Kendalville, as just as we were pulling out of there, the next morning for our run to Chicago, we enjoyed (?) our first puncture. This was soon remedied, and we started on the last lap of our trip with Chicago as the objective point. We left Kendallville at 8:00 A.M., lunched at South Bend, arriving there close to 12 o'clock, and reached Chicago at 4:10 P.M."

LATEST TYPE OF FRENCH TRACTOR.

PARIS, Dec. 1.—In the agricultural world the French motor constructor has allowed himself to be outdistanced by the more practical and more commercial American. There are only three or four successful agricultural tractors constructed in France, and not one of them can lay claim to anything like general application. Each one has its own distinctive features and may be regarded more in the light of inventors' experiments than the machine that the farmer will receive with open arms.

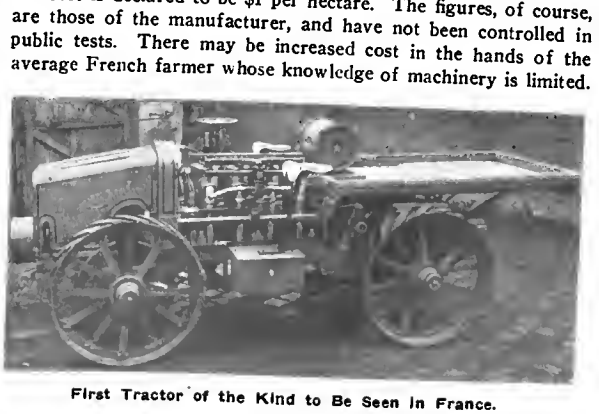
A newcomer to the small group has just been made in a four-wheel drive tractor, the first of its kind to be seen on this side of the Atlantic. The motor is a four-cylinder gasoline one with separate cylinders developing about 50 horsepower. The power plant is placed in the center of a robust pressed-steel frame, and transmits power forward to a gear box occupying the position usually reserved on an automobile to the engine. From the three-speed gear box a countershaft carries the drive by means of gearing to the front wheels. As the drive is through universal joints, the front wheels still retain their steering functions. From the left-hand side of the forward countershaft drive is carried rearward by means of bevel gear and propeller shaft running alongside the engine, to the rear countershaft, the final connection being by double side chains to the rear wheels.

In general design the engine has little that is distinctive. The four separate cylinders are water-jacketed, have valves on one side, high-tension ignition with current supplied from storage batteries, and gasoline supply by gravity from a tank immediately behind the driver's seat. There are two radiators, one immediately in front of the engine, and one at the fore end of the chassis. The rear one has immediately behind it a ventilator fan which drawns in a current of air from the bonnet, which, in this case, only serves as a covering for the gear box.

Drive is taken from the engine by means of a cone clutch at the fore end, transmitting the power to the gear box with three speeds forward and reverse. In this tractor all the work naturally comes on the transverse shaft carrying the universals and connecting up to a large pinion on each driving wheel; for, in addition to driving the front wheels, the shaft has to transmit power to the rear wheels by means of the bevels, propeller shaft, countershaft, and side chains. The engine is a slow-speed one, running at about 600 revolutions a minute, and naturally gearing is very low, though no information would be vouchsafed regarding ratios.

Both front and rear wheels, made entirely of steel, and of equal size, are ribbed to give traction on soft ground. At the fore end of the chassis is a broad metal pulley by means of which the tractor can be employed for driving stationary machinery with belt connection. Steering is by means of upright column and wheel, engine control is by separate levers, and gear control by the usual type of side levers.

It is declared by the makers that the machine will plow to a depth of 4 inches at an inclusive cost of $2.20 per hectare (2 2-5 acres); for a depth of 6 inches the cost is given at $4.20 per hectare; for 13 1-2 inches the price is $8. For operating a reaper the cost is declared to be $1 per hectare. The figures, of course, are those of the manufacturer, and have not been controlled in public tests. There may be increased cost in the hands of the average French farmer whose knowledge of machinery is limited.



First Tractor of the Kind to Be Seen in France.

THE AUTOMOBILE

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EXPERIENCE AND SUCCESS BEGET COURAGE.

In the beginning the problem of the automobile was as an unsolved mechanical puzzle that cast a spell of gloom o'er financiers. Castings were cheap, dies were avoided, and temporary expedients reigned supreme. A little experience, a showing of success, and courage grew apace. It was never a question, as designers saw it, of the desirability of castings, or the uncertainty of forgings. It was simply a matter of courage on the part of designers to plan and of financiers to pay. The splendid crop of castingless automobiles to be seen at every hand to-day simply proves out the contention that an abstract idea is a tame cat in the absence of courage.

American automobile builders are forging to the fore, because they are possessors of enough courage to take advantage of quality, which, for the matter of that, is the twin brother of quantity, since the cost of correcting a mistake counts for little in the column of fixed charges in a big plant. The jigs, templates, gauges and dies, that in the abstract foot up to thousands of dollars, reduce to pennies per car, if the output is on a large scale, and duplication of parts so necessary in the long run becomes a reality in fact, instead of in theory, which can never be brought about in a shop in which cheap labor takes the place of tools of precision, and a perfected shop system.

The methods by which excesses of cheap labor whittle out cars—no two alike, from the point of view of the man with his instruments of precision in the inspection department of the big American shop—will scarcely keep pace with the more aggressive American process in which the personal equation is minimized. The fixed arguments advanced to lend color to hand-made products, at the cost of cheap labor, will scarcely hold water, no more than a market could be created for hand-hewed watchdogs, even though they could be fitted with a mechanical snarl.

* * *

LEFT HAND CONTROL FOR TOWN WORK.

Innovations in design or style that are in the least degree radical have seldom been undertaken in the automobile field without considerable preliminary delay, pending which the growth of the demand for the change made it easy to accede; except, of course, at the expense of makers rash enough to attempt to introduce something which was either a foreordained failure or which was in advance of its time. But, then, it would take a volume to record but a small part of the history of those "who guessed wrong" and went to the wall in consequence, or of those who tried to force engineering "ideals" upon the public and persisted in doing so until the receiver put an end to their well-meant but misguided efforts. Few things as has the automobile shown in such a striking manner what a costly and thankless job is the task of educating the public.

It is the general consensus of opinion that the left hand side of the car is the proper place of control for town work under American rules of the road, and while the subject has never here come in for the extended threshing out that our British cousins have given it not so very long ago, more than one American maker has decided to have the courage of his convictions by adopting it for his 1909 output. Instead of arguing the point pro and con through many reams and then letting the thing die a natural death, these American makers have acted first and will talk afterward. That the change is one involving numerous advantages is obvious, and it is, further, one that involves no fundamental departure in design or construction. The manner in which it is received should prove of interest, though its adoption should come much more easily through its compulsory use on the taxicab than might have been the case in earlier days.

* * *

A WINTER OF AUTOMOBILE LAW-MAKING.

Indications multiply that this Winter will see considerable activity in the making and unmaking of automobile laws in not a few State legislatures. The inconsiderate few are going to make it extremely hard for the representatives of the great majority to secure reasonable laws or to retain liberal restrictions which were secured at considerable effort. There is a growing sentiment that the drivers of all automobiles should pass some kind of an examination, and, furthermore, any criminal abuse of the roads should be punished by a revocation, temporary or permanent, of the guilty driver. The time has arrived when automobilists generally must lend both their aid and moral support in purging their ranks of the highwaymen of the roads.

AUTO MAKERS INTERESTED IN TARIFF REVISION

WASHINGTON, D. C., Dec. 7.—Contrary to expectations the hearing of the representatives of the automobile manufacturers before the Ways and Means committee, scheduled for today, did not materialize. A number of those prominent in the trade held a meeting in this city Sunday night and went over the situation very thoroughly. Recognizing the fact that they did not have sufficient data at their command at this time to lay before the committee, it was decided to ask the committee for an extension of time in which to file an elaborate brief and also to make an oral statement before the committee. When Chairman Payne called upon Mr. Briscoe this morning, the latter stated the situation to the committee and asked for two weeks' time in which to prepare the brief. The request was granted, Chairman Payne stating that the earlier the brief was filed the better it would be for the interests represented.

It was undestood that the automobile importers would again be heard by the committee this morning, but none of them appeared, and it is likely that any further arguments they wish to make will have to be submitted in the shape of a brief.

Later in the day the automobile men were interested spectators of the convening of the second session of the Sixtieth Congress, having seats in the reserved gallery.

The party included Thomas Henderson, president of the National Association of Automobile Manufacturers; E. P. Chalfant, general manager, and H. B. Joy, L. H. Kittredge, A. L. Riker, and G. H. Stilwell, of the Association of Licensed Automobile Manufacturers; Benjamin Briscoe, chairman, Alfred Reeves, general manager, and Job T. Hedges, counsel, of the American Motor Car Manufacturers' Association.

Viewed by General Manager Chalfant, A. L. A. M.

"The importers of foregn motor cars must surely feel that they were exposed to ridicule by the absurd statements of their representative before the Ways and Means committee, Friday, November 27," is the reply of E. P. Chalfant, the general manager of the Association of Licensed Automobile Manufacturers, when interviewed concerning the representations made by Chas. H. Sherrill in behalf of the Importers' Salon, who asked for a reduction in duty from 45 per cent. to 30 per cent. ad valorem.

"American automobile manufacturers have not made exorbitant profits, and a relatively small number of them have made profits at all. The manufacture of automobiles first began to assume the proportions of an important industry in 1902. Following is a table of the vital statistics of the trade:

Concerns in business in 1902	51
Started from 1902 to 1906 inclusive	270
Total	321
Discontinued during five years	155
In business December 31, 1906	166

"There are now listed 253 makers of automobiles in this country, of whom about 100 are turning out cars in fair quantity.

"It is safe to say that not 10 per cent. of the American automobile manufacturers are making money. A great deal of the manufacturers' money goes for experimentation. The large amount of capital required and the character of the business eat into the profit of the business very materially. Clearly the industry deserves proper protection from the normal production and the over-production of the European factories, with their cheap labor, low rate of taxes, and preferential rates on manufacturing machinery. In this country the cost of labor is two and one-half times what it is abroad. Materials abroad are cheaper, ground rent is less, the cost of living is less, the industry is taxed less, and all machinery imported for use in a new industry is admitted duty free or at a preferential tariff.

"When making the statement that 90 per cent. of the imported cars arrived in the shape of the naked chassis, it was apparently forgotten that just a little more than 40 per cent. of the cars imported during the last twelve months were complete with bodies, and that bodies for the remaining 60 per cent. (by no means all of them minus bodies) would not keep busy for more than a portion of the year even one of the two carriage makers whom Mr. Sherrill mentions as having been kept alive by the business of the importers, whereas all the carriage makers outside the metropolitan district probably do not collectively get a dozen bodies to manufacture in a year for imported cars.

"Tariff rates must afford ample protection to American made goods, and provide a customs duty on imports equal to the difference in cost of production here and abroad.

"It is needless to say that the statement that the Association of Licensed Automobile Manufacturers is a 'trust' is absurd. This Association, whose members conduct a strictly competitive business, is the most important thing in the country for the industry of motor vehicle building, for the dealer in automobiles and for the persons who purchase them. In a word, in 1903, certain representative automobile makers agreed to recognize the validity of the Selden patent and pay license fees thereon. In these days of strenuous and sometimes unfair competition it is refreshing to find that a friendly and cooperative spirit exists and a frank discussion of business proceedings taking place among men engaged in the same industry.

"Speaking advisedly for both the A. L. A. M. and the A. M. C. M. A., there is no trade agreement in the American automobile business regulating the price of machines. Each manufacturer is unrestrained and free to regulate his own prices, and does so. The division between the classes of manufacturers relates solely to the payment or non-payment of royalties under the Selden patent. The other regulations refer to questions of publicity, the dissemination of trade information and the standardization of manufacture.

"Naturally both Associations have given the matter of tariff revision adequate attention, and some time ago presented their views in writing to the Tariff Committee of Congress. As heretofore, we will fight our battles in the proper forums. All the two Associations want is a square deal; a duty imposed on foreign built machines equal to the difference in cost of production here and abroad—giving the user (consumer) all the benefit in reduced price possible from the best and improved methods of producing good machines.

"The American automobile industry can live and succeed under the present rate of duty, providing only it is collected on the honest wholesale value of the foreign merchandize."

What the Ford Protest Set Forth.

WASHINGTON, D. C., Dec. 5.—The Ford Motor Co. has filed with the Ways and Means Committee, which is now engaged in a series of hearings preparatory to a revision of the tariff law, a strong protest against an increase of the duty on automobiles. Their protest is in part as follows:

"Within the past few days it has come to our attention that a large number of manufacturers of automobiles in this country, being, no doubt, a majority of the members of what is known as the American Motor Car Manufacturers' Association and the Association of Licensed Automobile Manufacturers, have appointed committees to attend a hearing granted by your committee on the subject of the tariff on automobiles. The time was so short that we did not have an opportunity of bringing the matter before the associations above mentioned, but we have written to all of the members of this committee vigorously opposing the petition which they propose to present to your committee urging for an advance of the 45 per cent. ad valorem tax now imposed on automobiles to 60 per cent. ad valorem.

"We believe that this petition does not represent the position and attitude of all the members of the associations referred to.

We are unalterably opposed to any increase in this tariff. We believe that this so-called infant industry is fully protected all it should be, and, in fact, we believe the present tax is a greater protection than this industry should have. The industry bas progressed sufficiently far, we believe, not to be entitled to any greater protection than would be represented by tbe actual difference in the amount of labor paid to manufacture automobiles in this country and that which is paid to manufacture automobiles in Europe. This difference is very small, as the amount of labor on automobiles in proportion to the amount of material is almost insignificant. If the tariff must be revised, it should be reduced and under no circumstances raised."

DECORATIVE SCHEME FOR PALACE SHOW.

Altbough there have been automobile shows for many years and although each year the decorating committee promises something new, different, and better, thus far they have been able to make good each time. This year, however, the show committee of the A. M. C. M. A. not only wishes to surpass all previous American but all similar exhibitions. A glimpse of the scheme will sbow in part wbether this be possible. More than this only the decorations themselves can show. Europe and this country have been searched by the S. R. Ball Company, the decorating contractors, for ideas which might be used in the Palace affair to make it different from other shows. Tbe fact that all the foreign makers are to exhibit in the Palace only, making it an international exhibition, adds to the ideas embodied in the decorations. For this reason the show committee included a considerable amount of European suggestions in the decorating.

Thousands of lights, paintings, mirrors, statues, flags of nations represented, searchlights, and harmonious colors, will, in brief, cause the Palace show to be an event in automobile history.

The present entrance on Lexington avenue will be an attractive porte cochere, with statuary of Egyptian design supporting electric signs which will flash out a welcome. Large signs will cover the rear wall. Surmounting the columns will be a classic balustrade, urns filled with evergreens lending scenic effect to a painting representing an automobile, leaving a flaming trail of dust and light. The vestibule will be artistically draped with flags, while at the stairway approach will be two life size female figures resting on an eagle supporting a wheel, all finished in verdi antique. The ceiling of the entrance hall will be canopied in silk with light radiating from the center. The walls will be decorated with mural paintings by famous artists.

The main auditorium hall will be treated in early English style. The balconies are bidden by orange colored tiling, extending three feet outwards over the main hall, while meeting the tops of the present capitals will be a frieze depicting automobile contests, including the Glidden tour, tbe Vanderbilt, and the Savannah road races. The main auditorium will have its ceiling covered with a blue fabric, which, combined with lattice work, urns of flowers, and plants, will give a hanging garden effect. At the end of the ball, now the stage, a real garden will be formed of bay trees, evergreens, and flowers. By means of mirrors the room will appear twice as large as it is, while the decorations will be duplicated in many different forms.

Dividing the garden from the general exhibition hall will be a striking piece of statuary 15 feet in length and 6 feet high, with life-sized figures representing "Wisdom Instructing Youth in the Mysteries of Automobile Construction." Original statues of heroic size representing "The Spirit of Speed" are to stand on the balcony rails upholding flowers and streamers of electric light, which will lead to a ball in the center of the hall.

Another important improvement will be the installation of a café on the third floor. This year the café will be transformed into a reproduction of an old English inn. It was intended to build a German wine cellar, but in order to harmonize with the style of architecture, the management changed it into a room modeled after the interior of a famous Kentish Inn. A stone-wall effect will divide the room from the main exhibition hall, while old chandeliers, dishes and mugs will lend to the effect.

HOUPT TAKES ON THE HERRESHOFF.

Looking over the situation for 1909 develops new surprises every time the task is performed. The latest bit of information that should prove of more than passing interest to the supporters of the industry lies in the consummation of the deal by wbich Harry S. Houpt has taken over the entire output of the Herreshoff Motor Company for the coming year. The works of the Herreshoff company, at Detroit, will be devoted to the filling of Eastern orders during 1909, rather with the bope that in a year the capacity of the plant will be increased sufficiently to catch up to the general demand.

Lightness, strength, and absolutely up-to-date features are promised for the new Herreshoff cars, and widespread interest is aroused, especially in view of the moderate price that will go with the cars. It is proposed to furnish a bigh-class car, taking after the best European models, yet even so the design will be "Herreshoff" from tires to trim.

The Herreshoff will be shaft driven with a four-cylinder engine, water-cooled, four-cycle, and a self-contained power plant. The three point suspension will be embodied, and the transmission will be progressive, three speeds and reverse. The Herreshoff idea is that simplicity and the elimination of a multiplicity of small parts in and about the gear-set follow the adoption of the progressive type of gear. A tubular drive leads to a live rear axle, in which the compensating gear is of the bevel type, incorporating universal joints of a noteworthy design and means for lubricating and excluding grit. The rear (live) axle will be worthy of the rest of the design, and the wheels will be of a most advanced design fitted with 32 by 3 1-2 tires. Stress is laid on the design of the chassis of channel section, and of material the nature of which is reflected in the tests for physical properties, including a tensile strength of 135,000 pounds per square inch. Half-elliptic springs will be used, front and rear, and the front axle will be of the I section, nice proportions, and fine material; drop forged, of course.

The main attraction in the Herreshoff will be the motor, of the Herreshoff design, in whicb the speed possibilities lie between 200 and 2,400 revolutions per minute in actual service. Rated at 24-horsepower, and guaranteed to deliver the power, this motor, with large valves and a special carbureter, whicb largely influences the performance, will have a double system of ignition including a Bosch magneto. The flexibility of the motor has been favorably commented upon. The car weight will be 1,600 pounds, and the weight for power will therefore be such as to assure a "live" road performance.

The car will be on exhibition on or about January 1, though it is to be noted that it is Harry S. Houpt who "takes on" the Herreshoff—not the Harry S. Houpt Company, located at Broadway and Sixty-third street.

BENZ AGENCY ESTABLISHED IN AMERICA.

The presence of Herr Carl Neumaier, of the Benz firm, at the Grand Prize at Savannah, may have heralded to some few the news of an American agency for the Benz cars. So the announcement of the Times Square Automobile Company, of New York City, as holding company for the Benz Auto Import Company, with salesrooms at 1597 Broadway, will not be a complete surprise to those who have followed the success of this German car on the Continent.

September 1 the concern opened its new factory at Mannheim, Germany, which will allow it to branch out into foreign fields, something heretofore impossible because of the demand for these cars abroad. The shops now cover 13 acres, giving employment to 6,110 men. To those familiar with reliability and speed contests, the Benz is well known, having competed in many events during the last few years, both in America and abroad, and always showing among the leaders.

Tbe car driven by Hemery in both races will be on exhibition at the Broadway salesrooms until the opening of the Palace Show, where it will be shown along with three standard models.

WHAT CLUBS ARE DOING THE COUNTRY OVER

QUAKER CITY CLUB ENTERTAINS NOTABLES.

PHILADELPHIA, Dec. 7.—The Quaker City Motor Club made its initial plunge into society last Wednesday night, when upward of a hundred members and guests gathered around the festive board at the Hotel Walton, the occasion being the first annual banquet of the club. All the prominent local and State political lights were present, the only absentee of importance being Governor Stuart, who was called suddenly out of the city in the afternoon on official business. President P. D. Folwell occupied the chair, and G. Douglass Bartlett, the club's counsel and chairman of its enterprising legal committee, introduced the speakers in short speeches fairly bristling with wit.

His Honor Mayor Reyburn, after being liberally plastered with compliments by the toastmaster, reciprocated in kind, and handed the club a bouquet or two, especially complimenting it upon the management of the 200-mile road race in Fairmount Park, which wound up the Founders' Week festivities last October. The Mayor also expressed his appreciation of the work of the club in assisting tbe authorities in suppressing reckless driving on the city streets and in the suburbs and promised that as long as be remained at tbe head of the city administration he would aid in furthering every undertaking of the club. The Mayor is a most enthusiastic motorist, and the possibility of inducing the authorities to allow the club to run the Fairmount Park stock-car race as an annual fixture was discussed informally during the evening, the opinion being universal that the desired permission would be granted.

Director Henry Clay, of the Department of Public Safety, responded appreciatingly when his work in guarding the Fairmount Park course was lavishly praised by the toastmaster. The director lauded the automobile as an adjunct in municipal work and said the city is now negotiating with several manufacturers with a view of installing motor patrol wagons and ambulances and doing away entirely with the horse-drawn vehicles now used in those services.

The Philadelphia to Pittsburg highway was boosted in a neat speech by W. Hicks, of Tyrone, Pa., wbo put in a plea for the adoption of the Juniata Valley route when the route is finally decided upon. Edward Murphy, George Graham and A. Raymond Raff lent additional hilarity to the proceedings with witty speeches.

"Jack" Hiscock, a local newspaper man, struck a popular chord when he advocated legislation which would do away with the double license fees collected from Philadelphia outoists by the city and the State. His remarks, indeed, were so much to the point that a motion was carried instructing President Folwell to name a committee of the club to go to Harrisburg next January to urge the passage of legislation which shall do away with the necessity of local automobilists "coming up double."

NOW THE AUTOMOBILE CLUB OF ROCHESTER.

ROCHESTER, N. Y., Dec. 7.—The Rochester Automobile Club on account of conflict of initials with the Rochester Athletic Club has decided to change its name and will be known hereafter as the Automobile Club of Rochester. This flourishing club now has a membership of 538 and is working hard to attain the 600 mark.

Through the energy of the club signs have been placed on the road to Canandaigua by the new route. This road is reported in excellent condition and will be used next year while the Pittsford-Mendon road is being improved. The Churcbville road is still the best route to Batavia and Buffalo.

The club is working for the appointment of George C. Diehl, a member of the Buffalo club and of the Good Roads Board of the A. A. A., on the new Highway Commission.

BUFFALO CLUB LEADS IN ACTIVE MEMBERSHIP.

BUFFALO, Dec. 7.—The Automobile Club of Buffalo now has the largest active membership in the country, the additions made at the last regular meeting bringing the total number to 1,510. At the club's annual meeting and election of officers to be held Monday evening, December 21, in Concert Hall, just across the hallway from the clubrooms in the Teck Theatre Building, the following candidates will be voted upon: President, John M. Satterfield; vice-president, Laurens Enos; treasurer, Harry Thorp Vars; secretary, Dai H. Lewis; board of directors, Charles Clifton, E. R. Thomas, E. H. Butler, George C. Diehl, James N. Byers, Maurice M. Wall, and George P. Urban.

In case of the popular Mr. Lewis, this is a matter of re-election, he having held the position of secretary for several years. With Messrs. Satterfield and Enos, it is promotion, they having satisfactorily filled the positions of vice-president and treasurer respectively in the year just past. Frank B. Homer declined a reelection as president.

This vigorous club, it will be remembered, was the first in the country to oppose and defeat a city tax imposed on automobiles. Judge Hodson's opinions in this case will doubtless be an important factor to other clubs engaged in similar legislation.

NEW JERSEY CLUB HAS OVER 1,400 MEMBERS.

NEWARK, N. J., Dec. 10.—Two former United States Senators, a former governor of New Jersey, as well as a former mayor of the city of Newark, are among the many new members added to the roster of the New Jersey Automobile and Motor Club on Monday night. The list includes, besides ex-United States Senators, John F. Dryden and James Smith, Jr., ex-Governor Franklin Murphy and former Mayor Henry M. Doremus, of Newark, and also sixty prominent New Jerseyites who are prominent in political and financial circles. Aside from these, the list includes one woman member (making four women members of the club), as well as a batch of associate members. The New Jersey club is now pretty close to the Automobile Club of Buffalo with 1,400 active members in good standing. This does not include a large number of associate members, which swells the list materially.

WEBB NOW PRESIDENT OF LONG ISLAND CLUB.

BROOKLYN, N. Y., Dec. 7.—A record attendance was on hand for the annual election of the Long Island Automobile Club, Fulton and Cumberland streets. The reports of the various committees were read and plans for the winter discussed. The financial committee reported the club to be in exceptionally prosperous condition, the assets far exceeding the liabilities. A gain of over fifty members was shown for the past year, with the list constantly growing.

The election resulted as follows: President, Frank G. Webb; vice-president, William Schimpf; treasurer, C. C. Cluff; secretary, Herbert Andrews. The three new members of the board of governors are Alfred Wilmarth, Charles J. Edwards, and Dr. A. C. Howe.

HARTFORD CLUB AFTER SPEED MEMBERS.

HARTFORD, Conn., Dec. 7.—The past week has been a lively one in automobile club circles; Wednesday evening the governors of the Automobile Club of Hartford met to hear the cases of two members who had been summoned for violation of the speed law. The notification of violation of the law was forwarded by the club attorneys, Schutz & Edwards. One member who had been communicated with did not like the tone of the letter he received and forthwith tendered his resignation to the

board, which was not accepted. At the request of the club secretary the member in question appeared at the meeting and was represented by counsel. The case was thoroughly threshed out, and the member decided to withhold his resignation for another two weeks. In short, the first letter of the club attorney was not accepted in the spirit in which it was sent and this caused all the trouble. Another member who has been notorious for speed violations failed to appear and he was accordingly, by vote of the board, dropped from membership and so notified.

WILL WORK TO RETAIN CONNECTICUT LAW.

HARTFORD, Conn., Dec. 7.—The directors of the Connecticut Automobile Association met at the Allyn House Friday afternoon last. Colonel George Pope resigned as chairman of the legislative committee, and F. T. Staples of the Automobile Club of Bridgeport was elected his successor. Ralph D. Britton was elected chairman of the good roads committee. C. E. Whitney recommended that some provision be made for firms or individuals desiring to be associate members. Mayor George M. Landers of New Britain resigned as a director and chairman of the good roads committee. Objection was raised to the increase in the annual dues of the American Automobile Association from 25 to 50 cents for each member of the State organization. It was voted that the present law be commended to the State legislative committee, for the continuance of which everything should be done by the State body.

DENVER CLUB TO HAVE SHOW.

DENVER, COLO., Dec. 5.—The first annual automobile show of the Denver Motor Club will be held at the Auditorium, Denver, February 16, 17, 18, 1909. The show will be under the direct management of the show committee, consisting of Ralph W. Smith, chairman; C. P. Allen, Dr. E. F. Dean, George E. Turner, and Dr. W. H. Sharpley.

The committee will mail application blanks and floor plans December 1, and applications already on file will take up the major portion of the 16,000 square feet of available floor space. The main floor will be reserved for the exhibit fo complete automobiles. Two of the larger boxes will be reserved for the Denver Motor Club, which will hold open house for all show visitors. Special programs of an education and entertaining nature will be given each night. Excursion rates on all railroads during the week of the show is expected to aid materially in bringing people from all parts of the State.

A PENNSYLVANIA CLUB AFTER ROADS.

YORK, PA., Dec. 5.—Recommendations will be made to the City Council by the York County Automobile Association to have more streets in the city of York paved and rounded into better condition. This was the outgrowth of a meeting held last evening. A number of York merchants were present at the meeting and identified themselves with the new movement. Further plans relative to the improvement of county roads will be discussed and acted upon by the association at a meeting to be held some time this month.

NEW ORLEANS CLUB WANTS ROADS.

NEW ORLEANS, Dec. 5.—Things are humming in automobile circles in New Orleans. The recent races and the formation of the New Orleans Automobile Club and its affiliation with the A. A. A. have been eventful. All of the dealers report that business is getting brisker, and prospects are indeed encouraging.

A rousing big meeting of the New Orleans club was held last week, when the Louisiana Motor League affiliated with the new organization. The object of this club is for good roads, and from now on an active campaign will be waged in this direction. The first project taken up by the club is the building of a good shell road from this city to Chef Menteur, a famous hunting and fishing district, 22 miles from the city. The new road follows the lake and runs through some picturesque country. Several miles have already been built, and as the city, State and one of the railroads have promised aid, it looks as if it will be finished in short order. A clubhouse will be built at the end of the road.

The New Orleans Automobile Club has now several hundred members, and the aim is to get 1,000 members. President T. C. Campbell and Secretary-Treasurer Homer George have been among the leaders in this movement. Mr. George recently visited Birmingham and organized a new club there in place of the old one, which had died out. Two hundred members were secured in short order.

CLUB DOINGS IN GENERAL.

Alabama.—The Fulton County Automobile Club, through its attorney have filed application for letters of incorporation. This club is not organized for pecuniary gain, but to promote the best interests of automobile owners, there will be no capital stock, but it asks to be incorporated for fifty years. To accomplish its object this club proposes to establish club houses in the different sections of the county immediately, and take any further steps that will prove a benefit to the members.

TIRES FOR FIRE-FIGHTING APPARATUS.

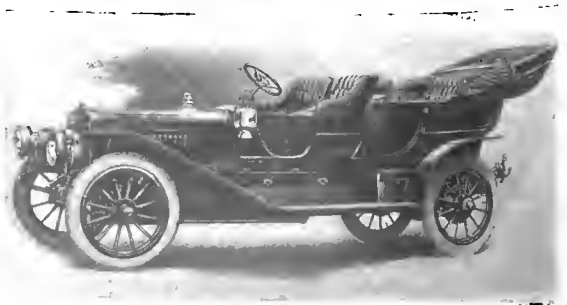
The recent increase in the use of self-propelled fire-fighting apparatus is very noticeable. Some of the far western cities have made remarkable progress in this branch. Thus the little town of Vancouver, B. C., now has no less than five pieces of fire apparatus which are motor driven, the latest to be received being two Seagrave combination wagons. This fire departmnet experimented with pneumatic tires, but owing to the heavy loads and high speeds required, these were not a success.

After trying out solid tires the doubt regarding their serviceability at these high speeds was soon dispelled, and the last two pieces of apparatus were consequently ordered with solid tires. These were specified of the cushion type, made by the Swinehart Clincher Tire & Rubber Company, of Akron, O. Considering that a guarantee of satisfactory service at a speed of 35 miles per hour was required, this order is gratifying to the company.

They attribute their success in this branch of service to the cushion effect produced by concaving the sides of the tire and also to the cross-wire type of fastening device. This fits into standard clincher rims, thus protecting the fastening and affords security against accident as well. This installation made after long tests and under such a strong guarantee will go far towards dispelling the mistaken idea that speeds of 12 to 18 miles per hour mark the limit of solid tires.

THE BIGGER OF THE TWO WINTON "SIXES."

The Winton factory for 1909 will concentrate on two six-cylinder classes, the smaller 45-horsepower and the larger 60-horsepower. These will be equipped with all forms of body, the cut below showing the neat lines of the 60-horsepower touring body. The air starting feature of these cars, so successful in the past, will be continued on both models.



Winton Six-Cylinder Touring Car of 60 Horsepower.

AN ATTRACTIVE PROPOSITION FOR 1909.

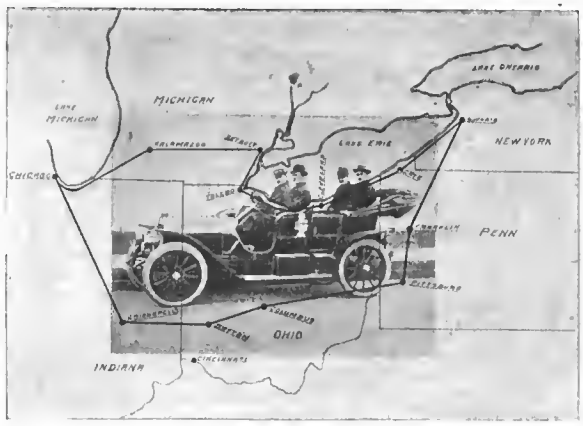
DETROIT, Dec. 7.—Low weight, low power, and low cost. High speed, high grade, and high art. Thus might a description of the "Hupp" be terminated. This car, made by the Hupp Motor Car Co., of Detroit, Mich., the general appearance of which is here illustrated, should be easily picked out in company, not so much because it is in any way at odds with the conventions, but for its rather strict conformity to the practices that are generally regarded as too costly to gain admittance to the haunts of the low-priced products. The average autoist seems to support a lingering suspicion that low price must carry with it a certain handicap by way of things that are not good enough to go into cars that are noted for their real qualities. Skeptics, with a penchant for riding in good automobiles, will have to revise themselves during the coming year, since the prices of cars do not always seem to be the gauge of quality.

The motor is of the water-cooled, four-cycle type, with four cylinders, and rated at 16-20 horsepower. Since the car weighs 1,100 pounds, the road performance will be that due to nearly 2 horsepower per hundred weight. Speed, of course, will assert itself under these conditions, and good road performance generally will be the natural sequence. From the motor to the transmission will be through a metal to metal cone clutch of suitable design and construction, and since the gear set is bolted to the motor case the system assumes unit power plant proportions.

One Attractive Proposition for 1909.

The engine is water-cooled, using a vertical tubed radiator, with straight "gills," and an adequate means of maintaining a vigorous circulation of the water. A Breeze carbureter is responsible for the mixture, and the gasoline system in general is up to the same standard of perfection. Considering the ignition, it is to call attention to the Bosch high-tension system to the entire exclusion of all other means besides.

These are some general features of the car: Frame of pressed steel, of the channel section, suitably braced laterally, is suspended on semi-elliptic springs in front, while the rear springs include "patented" lateral members. Since the car is of the shaft drive type, the radius rod details are in conformity, and the live rear axle is up to a fitting standard, with Hyatt roller bearings. Two sets of brakes are provided, both on the rear axle, and both of which are internal expanding. The service brakes are controlled by a foot lever, and the emergency brakes answer to the beck of a suitable side lever. Universal joints are used on the cardan shaft, and means are provided to exclude "grit," providing at the same time adequate oiling facilities. The steering post is at a desirable rake, and lost motion, so much to be avoided, is suitably guarded against. An appropriate runabout body, complete set of tools, oil lamps, and a dragon horn are included in the price. The illustration shows the appearance of the body, and the fuel tank will be seen back of the seat. The mud guards are worth taking a look at as well. The car as a whole should make its mark. The price is $750 F.O.B.



Inter-State Demonstration of a New Model.

DEMONSTRATION OF A NEW MODEL.

The illustration above is that of one of the Model 9-H, $1,500, Stoddard-Daytons while on the first demonstrating trip. This trip, as outlined by the map, covered a route taking in Indianapolis, Chicago, Kalamazoo, Detroit, Toledo, Cleveland, Erie, Buffalo, Franklin, Pittsburg, Columbus, and return to Dayton. The total mileage of this trip, including several demonstrations in each of the above towns, was 2,164 miles, in which it was estimated a total of 112 gallons of gasoline was consumed. This gives an average of 19.36 miles per gallon, which it must be understood includes the average consumption of any one month's driving of this model, as the car was gone from Dayton exactly one month, and the above was the total "gas" used.

A BRITISH COW-CATCHER FOR AUTOS.

Everybody likes to be up-to-date. There is no doubt about this particularly in this country, but it is doubtful if many of our rural automobile enthusiasts will follow the lead of an English car owner who has fitted the front of his car with a buffer of immense diameter and very strongly built. A better name to give this peculiar accessory might be "cow-catcher," for that is the peculiar purpose for which this was intended. The owner of the large car shown in the accompanying cut, as it appeared on the Strand, London, was greatly annoyed on his country trips by having to wait for cattle in the road to move aside. Not daring to ram them with the ordinary fragile front end, he conceived the idea illustrated. These cow-catchers, for there are two of them, are so strongly built and also so rigidly attached that cattle are unceremoniously pushed aside.

Here is a British "Cow-Catcher" for Autos.

N. A. A. M. SAYS A. A. A. SHOULD CONTROL.

That the control of automobile racing in this country should be retained by the American Automobile Association was the opinion expressed at the regular monthly meeting of the executive committee of the National Association of Automobile Manufacturers, held December 2, at the association headquarters in New York City.

The action, however, did not find any objection whatever with the recently adopted policy of the A. A. A. to decline hereafter to recognize races on half and mile circular horse tracks.

In conjunction with the general work of the A. A. A., as outlined by President William H. Hotchkiss, who addressed the meeting at considerable length, the executive committee promised substantial financial support. At the request of the A. A. A. a committee consisting of H. O. Smith, W. E. Metzger and S. A. Miles was appointed to serve on its executive committee. The same trio were designated a committee to confer with the Contest Board of the A. A. A. relative to the endurance tour of 1909.

The Waverley Company, of Indianapolis, was elected to membership.

C. G. Stoddard, of the Dayton Motor Car Company, Dayton, O., was elected to the executive committee.

The traffic department of the association has recently arranged important changes affecting the transportation of automobiles to the South and West. While in the West recently Mr. Marvin, manager of the department, held meetings with the traffic managers of the various factories in and near Indianapolis, Detroit, Chicago and Cleveland. In each place a permanent committee was formed, which committee will hold meetings at regular intervals to discuss traffic details and take suitable action in relation thereto. It is expected that uniformity of opinion and closer co-operation between the factories and the traffic department will result and that a great deal of benefit will be derived therefrom. Further meetings of these committees were held last week. In due course the traffic managers of Eastern factories will be similarly organized.

The annual meeting of the association will take place on Wednesday, January 20, 1909, probably at the Victoria Hotel.

CHALFANT NOW A.L.A.M. GENERAL MANAGER.

E. P. Chalfant is now the general manager of the Association of Licensed Automobile Manufacturers, he having been selected at the meeting of its board of managers held December 3. Mr. Chalfant for several months past has been acting as assistant general manager, and he succeeds M. J. Budlong, whose duties as manager of the New York branch of the Packard Motor Car Company prevented his continuance.

These were present at the meeting: Elmer Apperson, Apperson Bros. Auto Company; John S. Clarke, Autocar Company; W. C. Leland, Cadillac Motor Car Company; Roy D. Chapin and Lee Counselman, Chalmers-Detroit Motor Company; M. S. Hart, Corbin Motor Vehicle Corporation; J. H. Becker, Elmore Manufacturing Company; Wm. E. Metzger, Everitt-Metzger-Flanders Company; H. H. Franklin and G. H. Stillwell, H. H. Franklin Manufacturing Company; E. R. Hewitt, Hewitt Motor Company; A. N. Mayo, Knox Automobile Company; S. T. Davis, Jr., Locomobile Company of America; H. A. Lozier, Lozier Motor Company; C. W. Matheson, Matheson Motor Car Company; L. H. Kittredge, Peerless Motor Car Company; A. L. Pope, Pope Manufacturing Company; George Pope, Pope Motor Car Company; George J. Dunham, Royal Motor Car Company; G. E. Mitchell, Alden Sampson Manufacturing Company; R. H. Salmons, Selden Motor Vehicle Company; I. H. Page, Stevens-Duryea Company; E. S. Church, Waltham Manufacturing Company; Thomas Henderson, Winton Motor Carriage Company.

The above includes George J. Dunham, the new president of the reorganized Royal Motor Car Company, of Cleveland, O., which hereafter will be known as the Royal Tourist Car Company. Very recently the Ohio courts relieved the Royal company of its receivership.

DUNHAM HEADS ROYAL TOURIST CAR CO.

CLEVELAND, Dec. 7.—Free at last of the receiver, the Royal car is once more being made by an unencumbered company. The Royal Tourist Car Co., which succeeded the receiver, is now embarking upon an aggressive campaign, and appearances point to a successful season.

George J. Dunham, formerly the Royal and Corbin agent in Boston, is the president of the new company and will remain in this city in charge of the active management of the new concern. He has created a very good impression locally.

When taking up the duties Mr. Dunham expressed confidence in the new high water mark to be made in Royal Tourist progression. "Capital and experience will go hand in hand in future so far as our company is concerned," he said. "We start our fiscal year without a dollar of indebtedness and we are amply prepared for an aggressive campaign along lines of solid business merit.

"In many respects our new model, several of which have been completed and will very shortly be in the hands of our agents, embraces improvements and up-to-date refinements that stamp it as being in a distinct class. A larger motor with extra fuel saving carbureter, a change in transmission, a simplified rear axle, improved brakes and greater accessibility are noticeable features which we have striven for and the motoring public will soon have an opportunity to judge for itself as to the true quality of our product.

"Our factory facilities and general equipment in so far as the literal manufacturing of cars is concerned are unexcelled, and with the returning wave of confident prosperity to the country as a whole, my best efforts will go forth in the endeavor to place the Royal Tourist in a position of unassailable supremacy."

PHILADELPHIA TRADESMEN ELECT OFFICERS.

PHILADELPHIA, Dec. 7.—The annual meeting and election of the Philadelphia Automobile Trade Association was held last week at its offices in the Odd Fellows' Temple, a surprisingly large proportion of the membership being present. The report of Secretary J. Henry Beck showed 31 active and 14 associate members now on the roll, the former being automobile branch house managers and agents, the latter tire and accessories dealers. A loss of five members during the year was more than offset by the addition of twelve new members. The treasury was shown to be in a comfortable condition, a neat balance being reported. The prospects for the next show seemed to indicate that it would be the "best ever" in the history of the association.

The election resulted in the choice of the following officers to serve during the ensuing year: President, J. A. Wister, of Gawthrop & Wister (Elmore); vice-president, E. C. Vanderhoof, of Bergdoll Motor Car Company (Benz, American Locomotive, Chalmer-Detroit, and Oakland); secretary-treasurer, W. J. Foss, of the Foss-Hughes Company (Pierce and E-M-F "30"); the foregoing with A. E. Maltby, of the Winton Motor Carriage Company, and Louis Block, of the Ford Motor Company, to constitute the Board of Directors.

A luncheon was served after the meeting.

ACTIVITY IN IMPORTATION OF AUTOMOBILES.

For the ten months of 1908, ending November 1, the report of the importation of automobiles is as follows:

United Kingdom	$141,553
France	1,453,939
Germany	54,595
Italy	453,638
Other countries	45,651
	$2,636,867
Parts of automobiles	505,818
Grand total	$2,636,678

For the ten months of 1908, ending November 1, the report of the importation of steel is as follows:

Bar stock	$35,304,819
Shapes and forgings	4,425,125
Total	$39,819,944

1906 Franklin, U. S. Army, Mariano, Cuba.—Used by Army of Cuban Pacification.

Prefers Auto to Horse.—To-day in Cuba the United States has an army of pacification, and its commanding officer, although able to stand the riding test required by President Roosevelt, finds that the horse as a means of army transportation is almost as much out of place in the twentieth century as is the sword as a fighting weapon. Accordingly, it is in an automobile that he shoots about the island which only ten years ago was the stage setting for Colonel Roosevelt and his Rough Riders, with all their trappings of horsemanship. In a Franklin motor car he makes quick trips across and about the island, the car's speed making it a Government time saver. Since it has been attached to the headquarters of the army of pacification the automobile has covered 30,000 miles.

Another Triumph for Locomobile.—Among the cities which are rapidly replacing the horse may be noted the place that Pabst made famous, Milwaukee. This hustling municipality has just added one to its list of cars, making six. More than this, the latest rumor is that the present fire engines will be replaced by motor-propelled apparatus. Milwaukee's latest addition is a special police car. The list now reads like this: Fire chief, Mitchell car; Board of School Directors, Ramhler; Police Department, Meiselbach truck patrol wagon body; Chief of Police Department, Locomobile. The Board of Public Works is about to choose a car, while other departments also have cars. The success of these cars induced the Common Council to appropriate $4,600 for the police car. Chief Janssen used his influence in this direction to secure a Locomobile. In making this selection he was influenced by a car of this make winning each of the 24-hour contests held in Milwaukee, the first with 1,149 miles in 1907, and the second with 992 miles in 1908.

A British Compliment to the Locomobile.—In a racing chapter, English *Motor* prints the following: "The Vanderbilt Cup race was run this year under a weight limit, disregarding the Ostend regulations, and consequently will probably be the last road race in which the old big-engine racers were used. The fourth contest for the Cup was won by Robertson, driving a Locomobile, which had been built for the last Cup race. They were beautiful cars, and their workmanship excited the admiration of even the foreign drivers, so that the Locomobile Company are to be congratulated on their success at the eleventh hour, when their cars were practically useless for international racing."

Thomas Gets the Standard Cup.—The beautiful silver trophy put up by the Standard Roller Bearing Company, of Philadelphia, for the car with its bearings which made the best performance in the recent Vanderbilt Cup race, has been awarded to George S. Salzman, for his consistent handling of the 115-horsepower Thomas. This recognition of Salzman's ability as a driver came as a surprise both to the Thomas people and the driver himself. That his driving was consistent is shown plainly by the times for the ten laps, which varied but little up or down from 22:40 each.

Louisville Dealers Organize.—For the purpose of formulating some definite plans for the second annual automobile show next Spring, the automobile dealers of Louisville have formed the Louisville Automobile Dealers' Association, which will be incorporated under the laws of Kentucky. Although the association was first conceived to make the proposed show a success, it will continue to interest itself in all automobile doings and particularly the welfare of the trade.

Long Trip for Two-Cylinder.—Dr. E. E. Brown, of Fort Bragg, Cal., recently completed a long-distance trip with his two-cylinder Rambler, passing through eleven States and a good bit of Canada. Starting from Fort Bragg, he spent two months on the road to Winnipeg, covering in all 3,123 miles. The only trouble reported during the trip was the loss of the mud apron from beneath the car and the cut-out whistle, which happened in the sage-brush of Nevada.

Noted Author Now a Pierceite.—Robert W. Chambers, the novelist, has just purchased a four-cylinder 40-horsepower Pierce-Arrow car with a suburban body. With the possibilities for stories that may be suggested to Mr. Chambers by the use of his car it should not be regarded as at all unlikely that within the next few years some critic may feel called upon to indite a monograph on "The Influence of the Pierce-Arrow on American Literature."

"Old Glory Team 1908."—The Peerless Motor Car Company, of Cleveland, O., is issuing a neat little booklet entitled "Old Glory Team 1908," which tells briefly of the performance of the now famous red, white, and blue team in the Glidden tour. This is copiously illustrated by views taken all along the route, beginning with the start at Buffalo to the finish at Saratoga.

Correction in Oakland Advertising.—In the November 26 issue the advertisement of the Oakland car, on page 94, erroneously stated that the four-cylinder model would be equipped with 32-inch wheels. This was not fair to the makers of this light car, who are putting on very large wheels, 34 inches in diameter, with 34 by 4 inch tires all around.

Peerless to Build in New York.—The Peerless Motor Car Company makes the announcement that it has purchased property on Broadway, where it will erect a permanent home for the New York branch. The building will extend back far enough to make a right angle coming out on Fifty-seventh street.

Cost of Model D Franklin.—Attention is called to the fact that the price of the 1908 Model D Franklin touring car, as given in the advertisement in November 19 issue, was a typographical error. The figures given, viz., $2,700, should have been $2,800.

Both Winners Used Same Shock Absorbers.—In the big and little car races at Savannah the two winners were equipped with Truffault-Hartford shock absorbers. Incidentally, the first four cars in the Grand Prize were similarly equipped.

Burdick Motor Car Company.—The American Motor Car Company, of Eau Claire, Wis., has filed an application changing the name to the Burdick Motor Car Company and changing the number of directors from five to three.

PERSONAL TRADE MENTION.

Patrick J. Brophy was the winner of the second Chauffeurs' Economy contest, promoted by the Brazier Auto Garage, of Philadelphia. He wins a handsome gold watch for his record showing the smallest fuel consumption, repair bills and general upkeep of nearly a score of contestants.

C. Royce Hough, the former factory manager of the Pope Manufacturing Company's plant at Indianapolis, and later of the Motor Car Company, Washington, D. C., has accepted the position of general manager for Fickling & Company, of New York.

Herbert Harold, formerly of the Locomobile factory force, has taken charge of the mechanical department of the Schreiber Motor Company, Milwaukee, Wis. He succeeds "Bob" Drach, who piloted the "Locos" to victory in two 24-hour races at Milwaukee.

"Jack" Harkins, the driver of the Chadwick entry in the recent Founders' Day 200-mile race in Fairmount Park, Philadelphia, is now selling goods for the Harris Fire and Rubber Company, Broad and Race streets, in the same city.

R. J. Skilton, recently connected with the Philadelphia branch of the Chadwick Engineering Works, of Pottstown, Pa., was last week introduced into his new position as city sales manager of the Oldsmobile branch in the Quaker City.

E. P. De Gollier, wbo has been connected with the Cleveland branch of the Oldsmobile Company for some years, has allied himself with the Auto Shop Company, Cleveland agents for the Thomas and Selden cars.

R. V. Connerat, of Savannah, Ga., has been appointed general manager for the Buick territory in the South, witb headquarters at Atlanta, W. H. Connerat, Jr., managing the Savannah business

Alex. T. Segura, well known in theatrical and automobile trade circles, has allied himself witb the Astor Automobile Company, New York City, as manager of the sales department.

S. J. Wise, late of the Packard and Garford selling forces, has gone witb Carl H. Page & Company, New York City, Eastern selling agents for the Chalmers-Detroit.

Dave Henry is now the sales manager of the Interstate Automobile Company, of Muncie, Ind., which is not located in Chicago, as was previously stated in these columns.

Albert A. Lamb, formerly of the Michelin branch in Philadelphia, has been appointed general manager of the James S. Griffin Company, New York City.

D. W. Gluck, late of the Packard Motor Car Company, of New York, has been appointed sales manager for Fickling & Company, New York.

S. R. Iams, until recently agent for the Royal Tourist in Western Pennsylvania, is now witb the Winton branch on Beatty street, Pittsburg.

RECENT INCORPORATIONS.

The Bertschy Motor Company, of Council Bluffs, Ia., has been incorporated with capital stock of $50,000 for the purpose of manufacturing automobiles. Work has already started on a factory at Sixth street and Eleventh avenue. The officers of the company are: President, T. R. Children; vice-president and general manager, A. J. P. Bertscby; secretary, G. S. Wright; treasurer, E. E. Hard.

Gloversville Garage Company, of Gloversville, N. Y., has been incorporated by W. D. Hyde, Morrell Voorman and J. W. Sisson, witb a capital stock of $15,000. The company has options on three different sites for the building of a garage during the Winter.

Brick Church Automobile Company, of East Orange, N. J., bas been incorporated with capital stock of $100,000 to manufacture and repair automobiles.

Post Motor Company, New York, has been incorporated with capital stock of $30,000 for the purpose of manufacturing automobile engines, etc.

Cameron Motor Car Company, New York, with capital of $150,000. Incorporators: E. D. Alexander, R. R. Logan and Frank Hildebrandt.

Weldon & Bauer Company, Newark, N. J., has been incorporated with capital stock of $15,000, for tbe purpose of carrying on a garage.

Lozier Manufacturing Company, of Plattsburg, N. Y., has filed articles of incorporation with capital stock of $60,000.

Electric Speedometer and Dynamotor Mfg. Co., of Delaware, has been incorporated with capital stock of $50,000.

Long Beach Garage Company, New York, has been incorporated with capital stock of $50,000.

CONCERNING THE AGENCIES.

Franklin Agency Appointments.—The H. H. Franklin Company, of Syracuse, announces the following agencies: Robert Gugin, British Columbia; Wallace L. Wilcox, Fall River, Mass.; S. C. Low Supply Company, 22 Fourth street, New Bedford, Mass.; Mack-Brooks Company, 124 West Market street, Lima, O.; Orange Auto Garage, East Orange, N. J.; Alexander-Seewald Company, Atlanta, Ga.; Charles Bilz, Colorado Springs, Colo.; H. E. Hartman, Nashua, N. H.; Inland Automobile Company, Spokane street, Walla Walla, Wash.; O. C. Bosworth, Putnam, Conn.

Oldsmobile, New Jersey.—The Oldsmobile Company, of New York City, has completed arrangements whereby it secures the territory in Northern New Jersey, and bas at once started to open branches in the various counties. The New Jersey headquarters will probably be established at Newark.

Cadillac, Winston-Salem, N. C.—The Forsyth Sporting Goods Company, agents for the Cadillac in Winston-Salem and vicinity, bas leased tbe new building on Liberty street for the automobile department of its business, which has been placed in the charge of G. C. Thomas.

Auto-Gas Tanks, Philadelphia.—James L. Gibney & Son, Broad street, Philadelphia, have taken the agency for the Auto-Gas tanks made by the Avery Portable Lighting Company of Milwaukee.

Fisk Tires, San Francisco.—Pacific Coast manager for the Fisk Rubber Company, G. E. Ichnson, sends the news that the San Francisco branch bas moved into its new quarters at Golden Gate avenue and Larkin street.

Locomobile, Pittsburg.—I. N. Dill, manager for the Central Pennsylvania Automobile Company, of Pittsburg, announces that bis company has taken the agency for the Locomobile.

Maxwell, Baltimore.—The Lambert Automobile Company, of Baltimore, agent for the Maxwell cars, has moved from Roland Park to Chase street, near Cbarles.

Overland, Baltimore.—Charles S. Houghton has taken the agency for the Overland car in Baltimore and vicinity, with headquarters at 329 Calvert Building.

Corbin, Lexington, Ky.—Joseph Matson, for the Corbin Motor Car Company, has established an agency in Lexington, Ky., with Smith, Watkins & Company.

Lozier, Baltimore.—The Lozier will be represented in Baltimore by the Southern Auto Company, Mount Royal avenue and Dolphin street.

E-M-F, Baltimore.—The agency for the E-M-F in Baltimore has been taken by the Motor Car Company, Maryland and Mount Royal avenues.

Brush, Cleveland.—The Brush car will be handled in Cleveland by Harry S. Moore, who also has the agency for the Stoddard-Dayton cars.

Regal, Nashville.—J. O. Caldwell has established the Regal Motor Company in Nashville and will have salesrooms at 145 Third avenue.

Moon, Kansas City, Mo.—The Moon Car Company has been formed in Kansas City, with Charles B. Merrill as manager.

Apperson, Seattle.—The Apperson cars will be handled in Scattle by the Seattle Auto Company.

NEW TRADE PUBLICATIONS.

Matthews Boat Company.—In an extensive catalogue of over 70 very artistic pages, the Matthews Boat Company, of Port Clinton, O., has gone into the subject in a way that is new and original. Beginning with the statement that a reader and prospective buyer's intereet ie ueually limited to three queetione: "Who we are, What we have to offer, and What is the cost," they have anawered theee queetione very fully. The second part or "What we have to offer," of course, takes up the greater portion of the book, giving as it does photos of the three principal claeses of boats built by them. These are open launches, runabouts, including racing boats, and cabin cruisers. The merits of the type of construction are shown by means of sketches, which bring out clearly the points of superiority. In the back a collection of letters from satisfied owners all over the country testify to the fact that Matthews boats are making good. An excellent picture of the launching and christening of a small cabin cruiser occuplee a prominent place on the front cover.

Peerless Motor Car Company.—The Peerless catalogue for 1909 is issued in two parts, the general catalogue and the limousine book. The latter is devoted to the enclosed cars with photoe showing the refinements found on the Peerlees cars, together with wash drawings indicating the many and varied uees to which the limpusine may be put. The general catalogue, copiously illustrated with photoe of the various units, including engine, transmiselon, transmission parts, etc., shows that this company will produce but two chasses for the coming year, viz., the four-cylinder, nominally rated at 30-horsepower, and the "six" called 50-horsepower. From the details, it will be noted that very few changes have been mads. The wheelbase is increased to distribute the weight better; a new universal joint between clutch and transmission, and a new herringbone gear for the water pump are the only differences to be found.

Edmund & Jones Mfg. Co., Detroit, Mich.—The new circular of this year's oil side and tail lamps ehows that the company is still working towarde simplicity. The lamps are riveted together, no screws being used, thus they are easy to keep clean. The best ground mangin mirrors are ueed in the searchlights, which are made in two types and eix different models. They vary in eise and price from Model 365, 8-inch diameter, at $8 up to Model 8880, 10½-inch, at $18.50. A brand new feature is the condensation cup. This is to collect the condensed water in the gas line from generator to lamp. Three wood screws fasten this simple little trouble saver to the under side of the running board.

American Simplex.—Among the advocates of the two-cycle automobile engine is numbered the Simplex Motor Car Company, of Mishawaka, Ind. A brand new catalogue of these cars shows the single model to be produced for 1909 equipped with four different bodies, touring, close-coupled, roadster, and limousine. The details of the mechanism are given with an exposition of the two-cycle principle and some very convincing pictures of a trip made by Col. C. G. Conn, of Elkhart, Ind., from the factory to Los Angeles, in one of their stock cars.

White Steam Ambulances, etc.—Owing to the importance that commercial work has assumed where the White steamer is concerned, the company has just issued a folder illustrating eome of the numeroue ambulances, patrol wagons and busses that it has produced within the last year or so. These include the equipment of many well-known hospitals and municipalities besides the Army and Navy.

Gelzler Storage Battery.—The Geizler Brothers, of 514 West Fifty-seventh street, New York City, have just issued their catalog announcement for 1909 which contains a description of the non-sulphating battery manufactured by them with especial reference to its use in connection with the ignition systems for all gas or gasolene engines.

Winton Motor Carriage Company.—This veteran concern has juet issued its 1909 catalogue, which is published with 48 pages enclosed in an artistically designed cover with "straight-from-the-shoulder" talk on what at least one company thinks of the six-cylinder engine, besides the complete specifications for the 1909 product.

Multiple Spindle Drills.—The Pratt & Whitney Company, Hartford, Conn., manufacturers of small machine tools, are sending out a beautifully illustrated pamphlet showing some of the many different types of multiple drills they manufacture, many of which are especially adapted to the needs of automobile work.

INFORMATION FOR AUTO USERS.

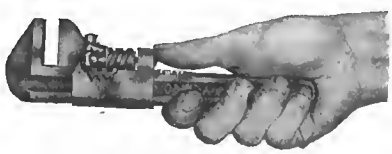
1909 Warner Auto-Meter.—It has been the consistent policy of the Warner Instrument Company, of Beloit, Wis., not only to put out a refined and beautiful speed indicating instrument, but an instrument that is calculated to give the best satisfaction under all conditions. The 1909 Warner Auto-Meter, which will be ready for delivery about the middle of the present month, and which is shown in the accompanying illustration, retains the principle of the speed indicating part of the 1908 instrument, but includes among other notable changes and improvements a new odometer with 100,000-mile season and 1,000-mile trip registers, and simple trip reset device. Another notable improvement consists of a new shaft and a new drive. In the new instrument the shaft will make one-half the number of revolutions of the old one.

WARNER AUTO-METER AND CLOCK.

In addition to the model shown in the cut, which is surmounted by the Warner Auto-Clock, another model, identical in design, but without the clock, is furnished. Each instrument will have an enclosed electric light, a valuable adjunct to the autoist after dusk.

As to the quality of the speed and distance recording instruments manufactured by the Warner Instrument Company, it is but fair to state that their construction is second to none. As an effective antidote to friction and wear, and to insure that every variation in the speed of the car, however minute, will be faithfully indicated on the speed dial, the dial rides in genuine sapphire jewel bearings. All driving parts are made of the best possible material, with absolute accuracy and longevity of wear as the chief ends in view. The new factory of the Warner Company is in keeping with the requirements of the high-class product it produces, its equipment throughout being of the highest efficiency.

Yemco Quick Acting Ball Bearing Wrench.—Smith & Hemenway, 108-110 Duane street, New York City, are offering to the trade a quick acting ball bearing type of monkey wrench, the especial feature of which will be understood by attaching the appellation "self-locking." The illustration here afforded will clearly show the details of interest, and the average mechanic will guess the rest. At all events, this self-locking idea is one to be appreciated, especially by autoists who experience trouble in keeping monkey wrench jaws adjusted, after a little lost motion creeps into the mechanism. The wrench is of convenient size, die forged of fine steel, and machined to a nicety. The "nickel" finish renders the wrench a fitting companion in the up-to-date tool kit.



YEMCO QUICK-ACTING WRENCH.

An Auto Duster That Absorbs Dust.—Sometimes it is the little things which go to make the maintenance of the car easy, and one of these conveniences has just been placed on the market by the Howard Duster Company, 164 Federal street, Boston, in the shape of a dustless duster, made of chemically treated cloth, which the makers assert not only removes the dust, but absorbs it, thus eliminating the dust particles which arise in the air, from being stirred up by the wiping, and action of the cloth. Not only will the Howard duster do the dusting, but it is useful for cleaning and polishing without scratching the finish.

Elmore Drop Forged Screwdrivers.—With the view of meeting the demand, not only of the makers of automobiles throughout the country, but dealers, garages and supply houses who have now adopted one certain type and style of screwdriver as being standard, and the one proven satisfactory for such heavy work, the Elmore Tool Manufacturing Co., of Hartford, Conn., has after exhaustive tests and experiments designed and perfected a screwdriver known as the "Elmore Drop Forged" to meet these requirements. The wood parts of the handles of these drivers are of the ribbed protection style on all sides, thus avoiding cracks caused by shrinkage. The entire driver, handle, and ferrule is drop forged from the best quality of steel, and the style and design is shown in the illustrations. The end of the driver is made very heavy and flat on the extreme end for hammering, and other unusual work sometimes necessary on automobiles, and the butt and ferrule end is constructed so as to prevent cracking the wood scales when used for such severe work. These screwdrivers are made not only with different styles and lengths of blades, but are made in several sizes of handles, from very small to very large, and with both round and square shanks. The capacity of the company's plant will enable it to manufacture tools of such type for the automobile trade in very large quantities.

TWO TYPES OF THE ELMORE DROP FORGED SCREW DRIVERS.

New Form of Primary Contact Maker.—The Monitor Manufacturing Company, of 1425 Washington street, Boston, Mass., has recently brought out an entirely new form of primary contact maker and is applying it to the already well known Bemus timer. By referring to the cut it will be noticed that a beveled roll is used for the primary brush. This roll is carried by a pin located off center relative to the axis, and designed to engage with steel balls. The boundaries of the balls touch on the beveled part of roll, causing the roll to turn on the pin and at the same time positively rotating the balls universally. This timer is supplied with a ground contact of special construction and designed so that the point of contact, which is a steel ball, will engage on the end of the roll. By this the best possible form of contact is made and the ground circuit is complete, without the fear of oil insulated joints or connections. In explanation of this it will be noticed that the current is brought in through binding post No. 16 on to roll No. 7, thence to ground contact connection, which is connected to battery, engine, or frame, thus avoiding the necessity of the current being obliged to travel through an oil insulated bearing. More timers fail to work because the ground circuit is not completed than from any other cause. All of the ball contacts are easily removed and cheaply renewed, being standard 3-8 inch steel balls. They may be obtained almost anywhere and the roll or primary brush can also easily be renewed at an expense of twenty-five cents or less, making an expenditure of not more than forty cents on a four-cylinder timer. This form of contact has been thoroughly tested and the results obtained are commendable. The timer has been run equivalent to 35,000 miles without its being necessary to renew either the roll or balls.

BEMUS TIMER DISSEMBLED.

Dover Tourist Oil and Gasoline Kit.—A neat, compact, and dust-proof device for carrying extra oil and gasoline when touring, that can be instantly attached or detached from the car, has just been placed on the market by the Dover Stamping & Manufacturing Company, of Cambridge, Mass. The illustrations show the form and relative size of the kit, which is 9 x 9 inches x 10 3-4 inches high, and consists of

TOURIST OIL AND GASOLINE KIT.

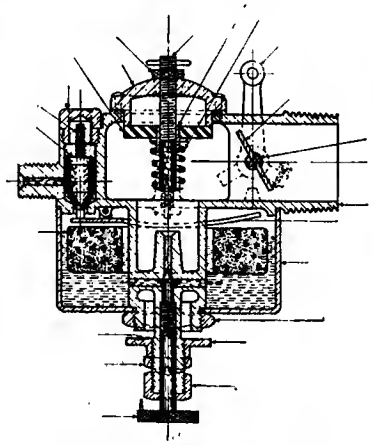
a black enameled steel case, which may be strapped instantly to the running board. It contains inside two enameled steel cans, having a capacity of over 1 1-2 gallons each, with special pouring spout and filler cap. One may be used for oil and the other for a reserve supply of gasoline, or both for oil, or one only may be used and the space occupied by the other be used for storage room. One special feature which the makers state ought to appeal to autoists is that it enables the tourist to carry a sufficient amount of his favorite brand of oil in a very convenient and compact form for quite an extended tour.

Neverout Gas Generator.—The illustration shows the Neverout patent air-cooled gas generator, made by the Rose Manufacturing Company, 910 Arch street, Philadelphia. Among the good things announced for this generator is a gas of intense whiteness and a flame that is perfectly steady, and as it employs the grate system with Neverout patent dome water feed, it is easy to clean, and can

NEVEROUT GAS GENERATOR.

be instantly and repeatedly lighted and turned off likewise, and without complications. The generator is made in two sizes, holding 2 and 3½ pounds of carbide respectively. The construction is strong, being made of drawn shells. The flame at the lamp jets is held constant because the generator supplies the requisite quantity of gas, free from impurities, at a constant pressure. The constant pressure is the product of a constant temperature of the dissolving carbide, and a suitable means by which the lime is shaken out. Patents have also been taken out in the principal foreign countries.

Oberdorfer Carbureter.—As will be apparent from the sectional illustration showing the details of its construction, the Oberdorfer is an extremely compact and well designed example of the concentric float type of carbureter, this advantage having been obtained in great measure by placing the auxiliary air valve directly over the spray nozzle, or in the mixing chamber. The gasoline supply enters at the left, dropping into the float chamber through the loaded valve shown in the cut, while the mixture leaves at the right as is indicated by the position of the throttle. The Oberdorfer carbureter was primarily designed for marine use and has been largely em-



SECTION VIEW OBERDORFER CARBURETER.

ployed on motor boats, which accounts for the design of the auxiliary air valve housing, this being intended to prevent the entrance of water. It has also been used to some extent on the automobile and both in tests and actual service had shown a high degree of efficiency as well as reliability in action, making an unusually uniform mixture at all speeds. Easy starting is one of its advantages, as when the carbureter is primed, the button not being shown in the illustration, a few drops of gasoline are caught in the cup of the adjusting screw of the needle valve located in the center of the main air intake, this insuring a supply of gas without delay.

It is being manufactured by the M. L. Oberdorfer Brass Company, Syracuse, N. Y., and as this firm has been turning out several thousand carbureters a year for the last two or three years, for well-known automobile manufacturers, they have excellent facilities for this class of work.

Air-Tight Steel Gasoline Tanks.—The economy of buying gasoline in large quantities is well recognized, but many automobilists are prevented from doing so by the trouble and danger of storing it in ordinary ways. The Air-Tight Steel Tank Company, of Pittsburg, Pa., has brought out a storage

AIR-TIGHT STEEL TANK IN USE.

tank especially designed for use by private automobile owners. The tank is simply buried in the ground in any convenient place, and the gasoline is forced out by air pressure instead of by a suction pump. The flow is always under perfect control. When sufficient has been drawn out, opening a valve on the air pump releases the pressure and allows the gasoline in the piping to flow back into the tank, where it is hermetically sealed.

New Model of Jones Speedometers.—The Jones Speedometer, Seventy-sixth street and Broadway, New York City, has placed upon the market four new models in order to meet the demand for a speedometer commensurate in price with cars of medium cost. For example, one can now purchase a Jones speedometer with a 50-mile speed scale for $15. This model brings a speed indicator of well-known quality within the reach of every autoist. Model 22 has Veeder season odometer 50-mile speed scale, and costs $5 more than Model 30. Model 27 indicates speed to 50 miles per hour and records season mileage with Jones enclosed odometer. Model 28 has the Jones trip odometer with its feature of recording cumulative mileage.

Improved Chauffeur's Truck.—The Grand Rapids Spring Company, of Grand Rapids, Mich., have just put on the market a small truck to be used by drivers and repairmen in general for getting at the under side of the car without coming in contact with the oily floor or the dirt. As shown by the accompanying cut the device is not bulky and may be easily handled.

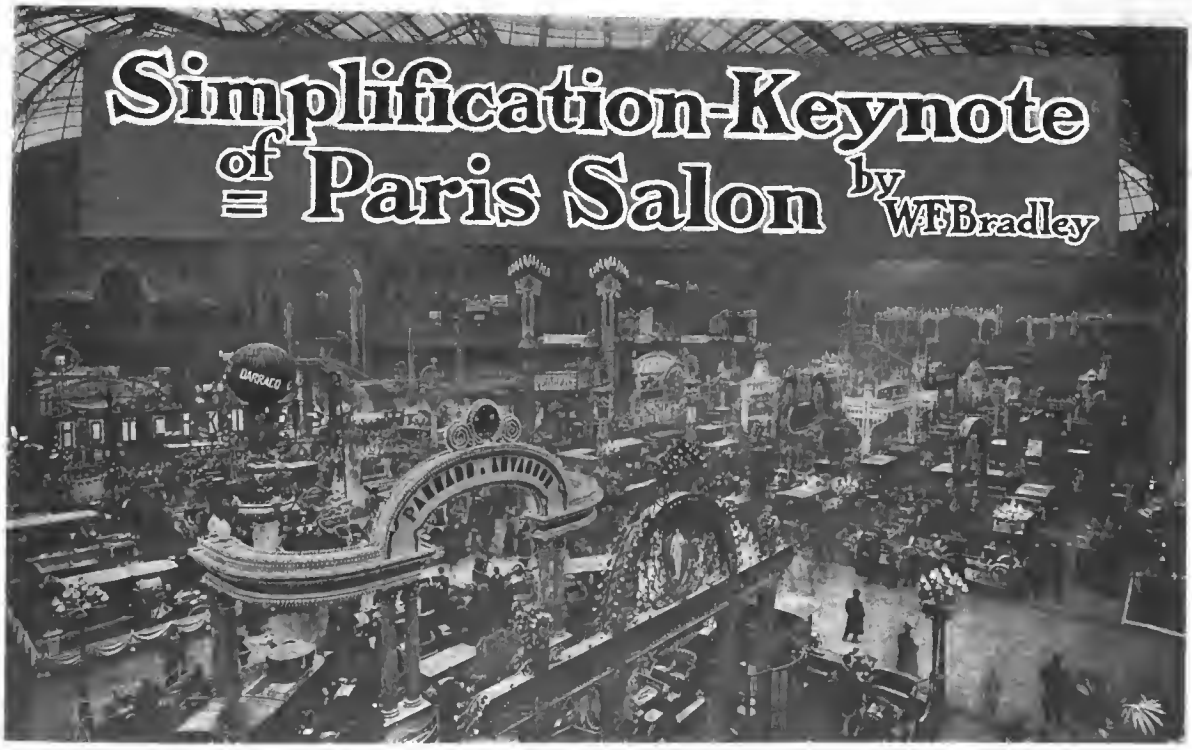
IMPROVED CHAUFFEUR'S TRUCK FOR GETTING UNDER A CAR.

VOL. XIX NEW YORK—THURSDAY, DECEMBER 17, 1908—CHICAGO No. 25

THE AUTOMOBILE

Simplification-Keynote of Paris Salon

by W. F. Bradley



PARIS, Dec. 10.—Simplification is the keynote of the eleventh annual Paris Salon. On the general lines of a design European constructors are pretty well of one opinion and there is no longer a discussion as to cone and disc clutches, shaft and chain drive, high and low tension ignition, selective and progressive gear change, thermo-syphon and pump-water circulation, pressed steel and armored wood frames, etc. While few constructors have made any remarkable changes in their chassis, all of them have sought to simplify them to the greatest possible degree. It is with a view to simplification that low-tension ignition has been abandoned by all the large constructors who up to the present have been its strong supporters. The change has not been made with the object of allowing a dual ignition to be fitted easily, for the simple reason that dual ignitions are very rare exceptions. Constructors are of the opinion that in the hands of an expert and for racing or demonstration purposes the low-tension system has advantages. But for the ordinary user, who is not an expert at tuning up a car, the high-tension magneto is the best system. This is further proved by the fact that such firms as Brasier, Berliet, Dietrich and Mercedes use the high-tension system for the small cars, likely to be handled by comparatively inexperienced men, and fit low tension to the powerful models generally driven by a skilled mechanic.

In the desire for simplification this year everything has been swept off the dashboard. The custom of

At the Michelin Exhibit the Bibendum Twins Reigned.

carrying a battery of sight feeds, a big lubricator, pumps, coil, oil, gas and water manometers, etc., in full view of the driver, has been gradually dying out, and it is now an exception to see anything more than a single sight feed and a switch. Panhard, for instance, who formerly made a dashboard display of a coil, lubricator and a few other articles, has simplified this portion of the car to a small sight feed and a switch. The coil is now under the bonnet and the lubricator is placed at the other side of the dashboard. On the new Berliet models there is not even the sight feeds, a plain glass tube oil level being let into the dash, and the two sight feeds for the rear axle and the gear box being under the bonnet. As this firm has abolished pressure-fed gas and oil tank and force feed-water circulation, the three indicators and the pump which were formerly necessary have been swept away.

On the Renault there is an interesting example of the stripping of the dashboard. No changes have been made in the system of lubrication, ignition or method of carrying gasoline tank, but instead of a large lubricator tank immediately in front of the driver there is now but a small sigh feed covered over with a glass plate flush with the dashboard, this being one of the neatest arrangements seen at the show. The oil-tank filler is immediately behind the radiator filler, the lubricator having simply been removed from the rear to the front of the board. It was noticed that of all the self starters which attracted so much attention at the show last year the only survivor was the one designed by Louis Renault, and shown on all the big cars of his make. The small self-starter, operated by the foot, was not in evidence.

A simplification of all piping, whether for oil, gas inlet or exhaust, was a notable feature. One of the most striking in this respect was seen on the new Charron two and four-cylinder cars. The float chamber, of the usual type, had its cover laid on the box by a flange only and held in position by a blade spring attached to a vertical spindle. The top of the box came off by merely lifting up the blade. Projecting from the float chamber was a tube the upturned end of which comprised the nozzle. Fitting over it was a plain copper tube with a bell-mouthed bottom, the upper end of which passed into the mixing chamber attached to the inlet manifold; thus the intake piping amounted to a six-inch length of copper tube held by a single screw. As the exhaust manifold was cast with the cylinders and the inlet and outlets for the circulating water were each cast in one piece connected up to the top and bottom of the dashboard radiator by a short length of hose, there was practically no piping on the car. With the magneto at the front of the engine and the four electric cables contained in a metal tube, the maximum of accessibility was obtained. It was noticed that each wire had a number attached to it, indicating the cylinder to which it led. This method of simplifying the water piping as shown on the Charron, was also to be found on a number of other new cars, a notable example being a Delaunay-Belleville six-cylinder with the water outlet in one piece screwed down to the cylinder bead and with a single connection to the top of the radiator.

Increased engine accessibility by mounting the radiator on the dashboard is no longer an exclusive Renault feature, several of the new cars having adopted it. A two-cylinder Berliet intended for taxicab and town work had been fitted in this way with a mass of plain copper tubes uniting an upper and lower tank on the dashboard. Several smaller firms had more or less slavishly copied the same idea. On the new Charron the dashboard radiator was formed of gilled tubes, uniting in an upper and lower tank, but instead of being carried right across the car, the central position, immediately behind the engine, was occupied by a fan driven by belt from the mainshaft. This arrangement added to the width of the radiator, causing it to be carried out to the full width of the side members, though at this point the frame had already been inswept to give the desired steering angle. The result was that the general lines of an otherwise handsome little car were slightly impaired.

Where the Bosch Magnetos Were Shown in Profusion.

Delahaye and Leon Bollee encased the valves by means of a sheet metal plate secured in each case by a single clip, the general arrangement being somewhat similar to that on the Winton car. When, as on the Delahaye, there was a single length of pipe only for the gas intake, the exhaust and the water inlet and exceptionally clean type of engine was obtained.

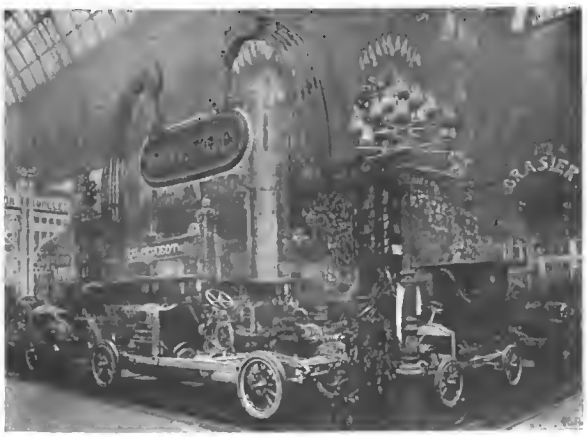
The influence of London police regulations on automobile design was shown on all the Darracq models. On the original taxicab model so well known in New York, the magneto was placed on the same side as the carbureter and carried in an

One of the Largest Displays Was of Continental Tires.

out-of-the-way position under the exhaust manifold. The London authorities, however, now refuse to pass any car for public service unless the carbureter is away from the magneto, with the result that the Darracq company has been obliged to put the magneto to the opposite side of the engine, carrying it on a special bracket cast with the crankcase and held down under a projecting arm from the cylinders. The improvement having to be made for the taxicab, the opportunity was taken of applying it to all models. As a number of French firms have obtained or are seeking the London taxicab business, magneto and carbureter on the same is an exception.

Shaft Drive Gains and Torque Rod Loses Ground.

Final drive by propeller shaft is more common than ever before, for the simple reason that more small cars are built, and European constructors are of the opinion that for low and moderate powers the shaft is preferable. For the highest powered cars, however, final drive by side chains maintains its position, the opinion being that at highest speeds and for heavy cars the chain is much more satisfactory than the cardan. It is an opinion that has grown as the result of racing experience. There is a tendency to get away from the use of a torque rod even on cars of comparatively high power. There was an example in one of the new Renault models, a car of 20-30 horsepower. On the other models from the Billancourt factory tubular torque stays were employed in place of the pressed steel one formerly



Artistic Showing Made by the Famous Renault Freres.

fitted. The only exception was the small runabout, which had no stay at all. A more general tendency was to strengthen the casing of the propeller shaft, letting it perform the functions of the torque stay. A neat arrangement on the shaft-driven Delahaye was the carrying of distance rods attached to the same hanger as the forward end of the rear spring.

Great Increase in Small Cars and Voiturettes.

Undoubtedly the most interesting work of the show was in the small car and voiturette classes. It is rather difficult to draw a distinct line of demarcation between what is a small car and what is a voiturette, but in the former would certainly be classed the new two and four-cylinder models from such firms as Renault, Brasier, Berliet, Dietrich, Charron, Delahaye, etc., while the voiturettes have as their chief examples such cars as the single-cylinder Sizaire-Naudin, Aries, Werner, Delage, etc. All the large firms, without an exception, have produced a little two-cylinder car of about 10 horsepower, capable of light taxicab work or for use as runabouts. Thus Panhard, in the old school, comes forth with a two-cylinder of this type, with the cylinders in one casting, and the engine forward bolted direct to the side members of the frame. Valves are all on one side, the oil tank is carried between the pair of arms on right-hand side of engine and the carbureter between the corresponding pair on the opposite side, the magneto—a Nilmelior high-tension—being in

The German Benz Had an Exhibit Complete and Unique.

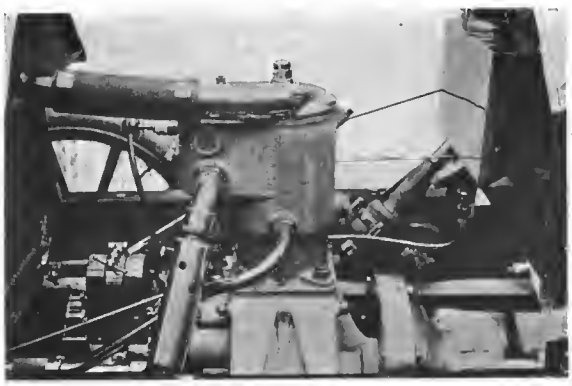
front. Water circulation is by thermo-syphon, with no fan behind the gilled tube radiator; lubrication is assured by a pump driven off the rear of the camshaft, the flow being through a sight feed on the dashboard. Engine control is entirely by pedal, there being no levers on the steering wheel. Cone clutch is provided; there are three sliding speeds and reverse and final drive by cardan shaft. Rear suspension is by three-quarter elliptics.

The Very Original Little Bayard-Clement.

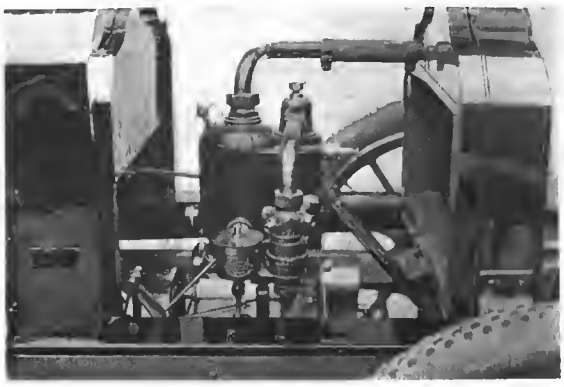
Bayard-Clement had one of the smallest and most original of four-cylinder cars, the cylinder measurements being only 65 by 100 bore and stroke (2.5 by 3.9). The four cylinders and engine base, together with exhaust and intake manifold, were a single casting, the crankshaft naturally being attached to upper portion, for no lower casting existed, and the oil pan being formed by a sheet metal casing band drawn tight by a single screw and nut. Valves were all on one side with spark plugs immediately over the inlet valves and magneto at the front of the engine. The mounting of the engine was somewhat original, there being a couple of radiating arms both front and rear, each one terminating in an eye hole, through which passed a steel tube with suitable flattened ends to allow of it being bolted to the side members of the frame. Cooling was by thermo-syphon with a special type of radiator consisting of about forty flat copper tubes uniting an upper and lower tank. The thin end of the tube was presented forward, and, in order to break up the current of air they were faced by a metal grating, giving the car the appearance of having a cellular radiator.

The same firm produced for the first time a single cylinder car pistons per cylinder, the combustion chamber being between metal base to the crankchamber. In both cases sliding gear

Harmonious Arrangement of the Display of Berliets.



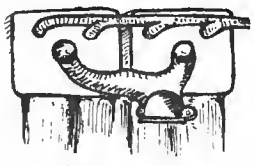
Corre One-Cylinder that Attracted Much Attention.



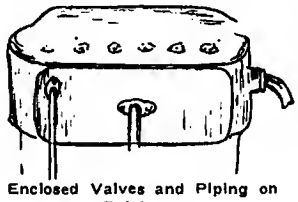
Another One-Cylinder French Car—The Truffault.

transmission of the straight through type was employed and final drive was by propeller shaft.

Motobloc showed the only single-cylinder engine with gearbox and crankcase in a single unit, the engine and transmission forming a single block, as on the larger cars by the same firm.



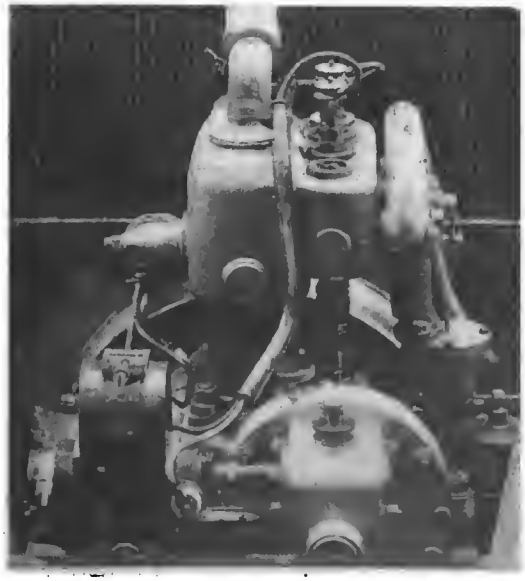
Top of Carbureter and Intake Pipe of Berliet.



Enclosed Valves and Piping on Delahaye.

A feature of the little car was the mounting of the honeycomb radiator in hinged bearings—with suitable oil-caps attached to prevent the straining of the tubes on a twisting of the frame.

In dealing with the voiturettes one enters to a certain extent the realm of the assembled car, for many of the firms in this class have not the resources necessary for producing an entire vehicle. In the majority of cases a De Dion or an Aster single-cylinder engine with high-tension magneto and thermo-syphon

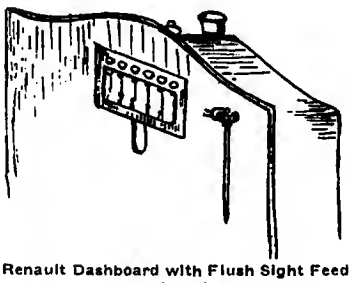


Power Plant of the New Renault Taxicab.

water circulation was employed. Such firms as Sizaire-Naudin and Chenard-Walcker produced a vehicle entirely of their own manufacturer. There is a disinclination on the part of all the voiturette builders to reduce the size of the bonnet in proportion to the size of the engine it covers with the result that there is a considerable amount of waste space. In several cases the unoccupied area between the front of the dashboard and the engine is taken advantage of to house the gasoline oil and water tank, and in one case to provide a chest for the most commonly used tools.

Air Cooling a Novelty in France.

The Henriot's company's stand supplied more of the distinct departures from standard design than any in the show. Among the novelties were a couple of air-cooled engines, each provided with a couple of fans on the valve side of the engine, driven in one case by bevel gear and upright spindle from the camshaft, and the other by belts from a pulley operated by means of bevel gear off the crankshaft. The single pulley, with a double-grooved face connected up by means of belts to transverse shafts, pass-



Renault Dashboard with Flush Sight Feed and Filler Cap.

Automatic Belt Tightener on Dietrich.

ing respectively between the first and second and third and fourth cylinders, the fan being attached to the opposite end of the shaft. A planetary transmission contained within the flywheel was attached to the same car. On the same stand was a four-cylinder water-cooled engine without radiator. On the front of the dashboard was a large water tank, through which the cooling water flowed by thermo-syphon circulation. An air pump, driven off the rear end of the camshaft, was connected up by suitable piping to the point at which the cold water entered the cylinders, and there discharged its jet of cold air, cooling the water and at the same time driving it into the jackets.

Knight Engine Not So Interesting to the French.

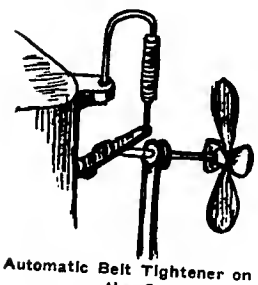
Knight's patent did not attract the same amount of attention here as at London, the Frenchmen evidently having less faith in its ultimate adoption than the Britishers. Minerva exhibited one

of these models, constructed in their Belgian factory, and the other was shown by Gem on a gasoline electric chassis, the motor being obtained from the English Daimler Company. Gasoline electric firms at the show were but two in number, the Gem and the V. A. T. E., the latter showing small cars with a single and two-cylinder engine driving a dynamo. Steam had not a single representative in the big hall.

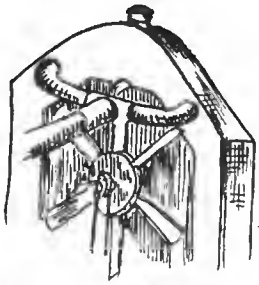
Aeronautical Influence Shown.

There was evidence that a large amount of serious work is being undertaken by European constructors toward the development of a light-weight engine for aeronautical work. The new Renault and the seven-cylinder Bayard-Clement were not shown, but will doubtless be brought forward for the second Salon, devoted to commercial vehicles and aerial navigation. Gobron displayed one of the most interesting of the light-weight engines with an eight-cylinder sixteen-piston developing 80-horsepower at 1,500 revolutions and weighing complete, with two magnetos, 460 pounds.

The cylinders form an X, each pair being placed in relation to its neighbor at an angle of 90 degrees. A two-throw crankshaft is employed, to one pin of which are connected up the eight pistons per cylinder, the combustion chamber being between the two. It is a principle that has been adopted to the maker's cars for years with very satisfactory results, the engine being regarded now as nothing more than a long stroke one. The cylinders are water cooled, circulation being assured by a pump working off the crankshaft and the water flowing through copper jackets surrounding the cylinders. Inlet valves are automatic, the exhaust mechanically operated by means of an oscillating arm for each pair of cylinders, there being no gears whatever for the valve mechanism. There are two magnetos, each one feeding four cylinders. This arrangement has been adopted in order to avoid the high speed which would be necessary for a single magneto supplying the eight cylinders of an engine revolving at 1,500 revolutions a minute and also as a measure of security. Should one magneto fail the engine could still run on the other with four cylinders sufficiently long to allow the aeroplane to be brought safety to earth. Lubrication, usually a difficult matter on engines of this type, is obtained by means of a pump on the outside of the engine feeding oil at the heads of the cylinders that are uppermost. The oil runs down to the base of the opposite cylinders, is there collected and again driven to the top. The carbureter is of the ordinary type.



Automatic Belt Tightener on the Gem.

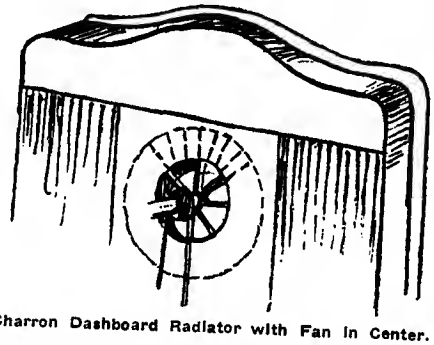


Arrangement of Water Pipes on Berliet.

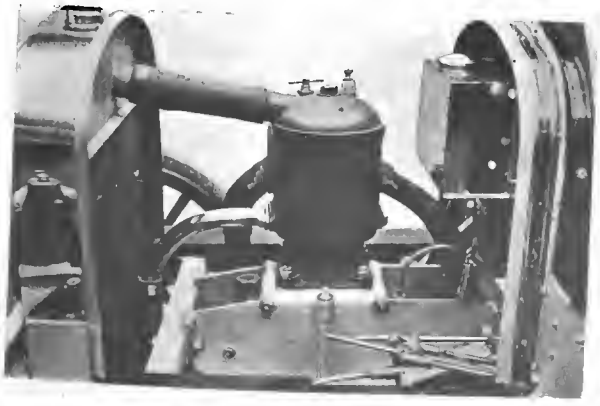
Darracq Method of Carrying Pet Dogs in Auto.

And Now Another Rotary Engine.

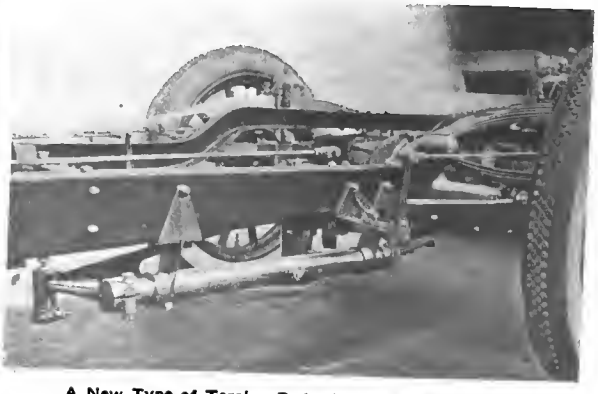
A light-weight rotary engine was shown by the Gnome company. The engine, which was constructed entirely of nickel steel, has four cylinders placed at equal intervals round a circular crankcase, fitted with radiating flanges and revolving round a fixed crankshaft, cooling being assured by their passage through the air. The crankshaft was hollow, carburetion



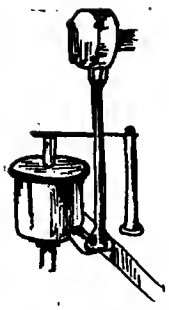
Charron Dashboard Radiator with Fan in Center.



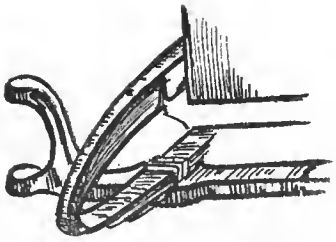
The One-Cylinder Motor as Shown on the Simplon.



A New Type of Torsion Rod with Ball Socket Joint.



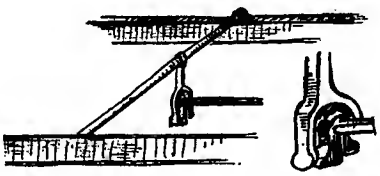
Carbureter and Intake on Charron.



Broadened Axle at Spring Seat of a Flat.

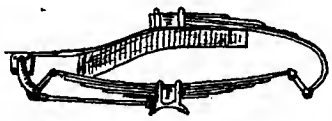
being through its center, and exhaust through mechanically operated valves in the cylinder heads. High-tension ignition was employed with a Bosch magneto.

Pipe, the Belgian firm, presented an eight-cylinder air-cooled engine of 3.9 bore and stroke, declared to develop 70 horsepower, and weighing complete 286 pounds. The mechanically operated valves were placed in the cylinder head and operated by overhead rocker arms from a single camshaft. Each valve performed both the functions of inlet and exhaust, the first position of the valve opening the inlet, the second position closing it by means of a sliding sleeve and opening the exhaust. Each line of



Gear Shifter on the Rochet-Schneider.

cylinders was surrounded by a sheet aluminum jacket with a bell bottom, a current of air being drawn in at the base of the cylinder passing upward to the head into a collector and outletting at the rear. The crankshaft was fitted with ball bearings at each end and the center; combustion chambers were hemispheric, ignition by high-tension magneto and ordinary type of



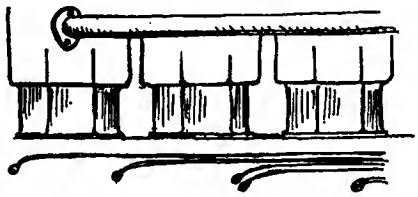
Distance Road and Spring on Same Hanger on Delahaye.

carbureter carried in the angle formed by the two lines of cylinders.

In the complete car class there were 66 six-cylinder engines shown by 38 different firms. The size of the cylinders varied from 5 1-2 inches bore and stroke on the Itala, to a 2 4-5 by 4 inches on a Delaunay Belleville. The most popular way of casting the cylinders was in groups of two, no fewer than 49 out of the 66 being designed in this way. There were but four with two groups of three cylinders and 12 with the cylinders cast separately. Delaunay Belleville had the only six-cylinder engine in a single casting. An interesting feature on the new Panhard was that though the cylinders were cast separately they were bolted up in such a way that they formed one group, the jacket of each cylinder slotting into that of its neighbor, and the whole being linked together by four bars passing through the water jackets longitudinally. This gave the advantage of six separate cylinders with the reduced area and absence of water piping of a single casting.

In a large number of cases it had been possible to put a group of six cylinders under the same sized bonnet as for an equal powdered car with four cylinders, manufacturers having sought, in a number of cases, to reduce the over-all length to a minimum. There were a few examples of very elongated bonnets, and in one case, the Mors, the rear cylinder had been carried under the footboard to gain space.

The popularity of high-tension magneto was fully demonstrated on the six-cylinder models, where of the 66 cars exposed 54 had high-tension and only 12 low-tension ignition. These latter comprised in all cases the most powerful cars and were presented by Mors, Mercedes, Itala, Brasier and Bollee. The



Method of Attaching Oil Heads on Bollee.

most general order of firing the cylinders on the six-cylinder models was 1 5 3 6 2 4, which was the method adopted on 41 of the total number of engines; in 9 cases the order was 1 3 5 6 4 2, the other methods being 1 4 2 6 3 5, 1 2 3 6 5 4 and 1 2 4 6 5 3, which were about equally divided.

There was but one example of an eight-cylinder engine on a car chassis, and even this one had been first designed for aeroplane work and slightly strengthened for automobile service. The cylinders, of 110 by 120 bore and storke, had copper jackets electrically welded on by a new process. Valves were all in pockets on one side of the engine, operated by a single camshaft and carburation and ignition followed standard lines. A distinctive feature was a variation of the timing by the sliding of the camshaft in its bearings at the will of the driver.

COMPONENTS SHOWN AT THE PARIS SALON.

Generally speaking, and this was probably on account of the plentitude of space in the galleries of the Salon, the components had a large department to themselves. Motors, frames, axles, gears, etc., made large displays, and the selection of tools was very extensive. This was a minor feature of the show, and the smaller road tools in particular were extraordinarily varied and compact.

President Fallieres Inspecting the Salon

A New England Reliability Run

Franklin

WORCESTER, MASS., Dec. 16.—An air-cooled Franklin, capably driven by C. S. Carris, evolved as the single winner of the 210-mile endurance and reliability run of the Worcester Automobile Club, held in and around Worcester county, Saturday, December 12. Fourteen cars started, of which two-thirds evolved with perfect road scores, but the Franklin was the only one surviving a searching examination of two hours on the part of the technical committee, which was finally forced to give up the task without even finding a screw or nut loose that would call for the slightest of penalties.

Carris, well known as a transcontinentalist, is a careful and experienced driver, and made no attempt to "burn up" the country roads, satisfying himself with getting into controls comfortably according to schedule. He has secured perfect Franklin scores in five endurance runs during the past season, including the annual A. A. A. tour for the Glidden trophy.

Second and tied in the honor roll are a Rambler, driven by B. A. Robinson, and a Cadillac, driven by H. J. Murch, both of which only suffered two points in penalization. Third is an American

Lozier

Cadillac

Knox—President Coghlin at Work

American

Premier

roadster, with five points charged; fourth, a Knox touring car, with six points away from perfection, and fifth is a Lozier runabout, with seven points loss.

Herewith is the official standing of the contestants examined:

1—Franklin, entered by Worcester Motor Car Co., Worcester; driver, C. S. Carris. 0

2—Rambler, entered by B. A. Robinson, Boston; driver, B. A. Robinson.

Loose petcock on pump	1
Loose pin on spark control	1
Total	2

3—Cadillac, entered by Murch & Hidden, Worcester; driver, H. J. Murch.

Loose terminal on dash	1
Loose bolt on rear end tie rod between radiator and dash.	1
Total	2

4—American Roadster, entered by American Car Co., New York; driver, D. F. Lloyd.

Bolt gone on engine pan	1
Nut loose on throttle bolt	1
Loose bolt in hood frame	1
Loose stuffing box on pump	1
Loose cup on steering knuckle	1
Total	5

5—Knox Touring, entered by Knox Automobile Co., Springfield; driver, Albert E. Dennison.

Loose nut on engine pan	1
2 loose spring clips	2
2 loose spring nuts	2
Loose adjusting collar on steering post	1
Total	6

6—Lozier Runabout, entered by Franklin Square Garage; driver, H. H. Cobe.

Loose screw in floor plate steering wheel	1
3 loose nuts in ignition coil	3
1 lost nut in ignition coil	1
Loose control head	1
Loose hose connection	1
Total	7

7—Premier, entered by Premier Depot Co., Boston; driver, Ray McNamara.

Loose nut on steering knuckle	15
Loose spring clip	1
Lose dash bolt	1
Small leak in radiator	5
Total	22

8—Berkshire, entered by Berkshire Motor Co., Pittsfield; driver, E. B. Belcher.

Loose radiator	4
Bolt lost from crank case cover	1
Bolt loose on crank case cover	1
3 loose spring clips	3
2 loose spring bolts	2
Packing gone from exhaust	1
Loose bolt on exhaust	1
Three men two minutes labor	12
Total	25

9—Studebaker, entered by Franklin Garage, Worcester; driver, J. Oswald.

Loose left mud guard	2
Left spring link upside down	5
2 loose bolts in left running board brace	2
3 engine frame bolts loose	3
Loose engine pan bolt	1
Loose steering gear joint	7½
3 spokes in rear wheel broken	15
Motor stopped 5 minutes	10
8½ minutes late at control	9
Total	54½

10—Lozier Touring, entered by H. C. & C. D. Castle, Boston; driver, E. F. Wilson.

10 spokes broken in left rear wheel	50
Loose nut on right spring clip	1
3 loose oil connections	3
3 loose nuts on coil box	3
Loose spring clip on rear spring	1
Loose terminal on magneto	1
2 loose spring clips	2
Loose left front bearing	1
Total	62

The examination was conducted Sunday at the Pilot garage, the cars having been in charge of a deputy sheriff over night. It required practically the entire day for the committee to complete its work. President J. P. Coghlin announced that it would not be until Tuesday before Referee A. E. Bliss, of Waltham, would be able to announce the official standing of the cars. The examination was one of the most thorough that has ever been made of cars in any contest in this country, and the committee was capable of doing its work with all fairness to every contestant, as not one of them was in any way connected with the trade, all being members of the staff of professors at the noted Worcester Polytechnic Institute.

The contest, as a whole, was one of the most exacting that could possibly have been planned. The cars and men were submitted to the severest of tests. That eight cars, more than half the starters should have come through with perfect road scores, speaks volumes in itself for motor car construction.

The six cars which failed to finish with perfect road scores suffered from accidents, in the main, and from other slight things wbich did not affect their structural features. For instance, the Studebaker car was penalized for being late at one of the controls simply because its operators had neglected to take the precaution to fill up the gasoline tank. The Berkshire operator forgot himself for a moment, when arriving at the city control upon the completion of the first run, and shut off his engine, thereby causing a penalty.

E. P. Blake, in the Jackson, smashed an axle owing to the slippery condition of the road, which caused his car to skid and make three complete revolutions, finally butting up against a woodpile and throwing out the four occupants, none of whom was injured.

Bourque, in the same Knox sportabout he drove in the Vanderbilt race, came to grief in Tatnuck. The American car ahead of him traveling at a great rate of speed began to skid, and Bourque, following closely behind, was in imminent danger of colliding. There was nothing for it, so he drove into a ditch at the risk of his life and the men witb bim, and broke the valve stem on his car. He withdrew rather than stand for 60 points penalization that making the repair would entail.

Dennison, also driving a Knox, had a close call on the fifth round. There was no way of seeing whether or not a train was coming in either direction at a grade crossing in Colebrook, and there was no flagman on the crossing. He was speeding along with three passengers and covered the crossing just a fraction of a second ahead of a fast express, which whizzed into sight and over the crossing.

Williams, in the Rambler, was unfortunate enough to have a key on one of the rear wheels shear off between Princeton and Quinapoxet and leave him helpless six miles from a telephone. He retired from the contest.

The White steamer, which had traveled some 20,000 miles this last season, and which up to the last control of the day, had been performing exceptionally well, met with slight difficulties and was penalized accordingly. The only other car to have double penalties was the Berkshire, which had to be pushed up a hill by the passengers on the last control of the day.

The contest started in a rain and snowstorm at 6 o'clock in the morning, which continued until noon. Then the sun came out, and the afternoon runs were truly enjoyable. The contest finished in darkness, about 6 o'clock. The contest was split up into five runs, each of about 20 miles out and 20 miles in. The snow of the day before made the going particularly hard out in the country. The starting and ending point for each control was in Worcester, so that the men and the cars were ever in touch with the base. This materially increased the interest in the run.

The rules called for some pretty severe work, and these rules were all carried out with the exception of the brake clutch and transmission tests.

Cobe started out on the first control to show what speed his Lozier had, and the others started in to follow suit. This quickly resulted in Police Chief D. A. Matthews sending a sergeant to notify President Coghlin that should the speed law be violated after the second control all drivers would be arrested and taken out of the contest. There were no arrests, the contestants slowing down while within the confines of the city.

President Coghlin Sunday night said be could state that no car had come through with a perfect score. This announcement came after the technical committee had handed in its report. The report was held up until Tuesday. Further than to say no car had come through with a perfect score, Mr. Coghlin would not then speak. Later he learned that there was one clean score car.

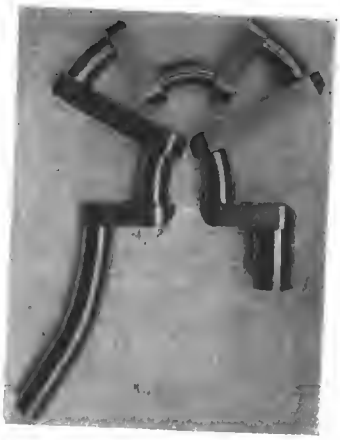
AUTOMOBILE MOTOR CRANKSHAFTS DISCUSSED

By THOS. J. FAY, President Society of Automobile Engineers.

IN the discussion of this subject the idea will be to favor the class of materials:

(a) susceptibility of die (drop) forging;
(b) easily fashioned;
(c) affording excellent bearing surfaces;
(d) of great rigidity;
(e) with notable kinetic ability;
(f) not impossible to procure;
(g) cost of the materials to be moderate.

It will not be considered proper, however, to assume that the materials as above outlined will be those of the common present practice since it cannot be shown that the common materials of the time are possessed of (d) great rigidity and (e) notable kinetic ability. This is not to say that the common crankshaft materials are without value for the purpose. The very service they render is an assurance of quality not to be attached to ordinary grades of steel. However good the run of steel may be, that is the steel advocated and used for crankshafts, the fact remains that there are a great many failures in the course of a year. Strange as it may seem the failures are not confined to low-priced steel; price alone does not seem to be the matter of moment.



Austrian Alloy Steel, After Undergoing Bending Test.

It is a monstrous iniquity to pay $150 for a crankshaft that will last no longer than a $30 member of the same order; this is not uncommon, and it leads one to believe that the $30 kind is, after all, the better of the two. Were a person to reach a conclusion as the result of noting one, two, or, ten failures of this description, 'twould be hasty; unfortunately, the number of such instances to be seen at every hand are too numerous.

The Two Points of View.

At all events there are two prime points of view of the crankshaft in the light of modern knowledge, i. e.:

(a) That involving the use of material so high in kinetic ability as to afford a long life even though the stresses result in deflections likely to end in disaster under the conditions involving the ordinary, or, even good grades of crankshaft steel. (b) The idea of materials so rigid in their initial status as to limit deflections under the most severe conditions to the purely nominal.

The first product, then, would be most pronounced in its kinetic ability, while the second product would be ambitious from the point of view of initial rigidity. This statement will be plain if we conceive of steel of a description such as will resist deformation to the maximum before deflecting, say, quenched tool steel, as compared with soft Swedish iron. These statements are not intended to convey the idea that the presence of pronounced kinetic ability would render it unnecessary to realize in the same steel a good showing of rigidity as well, nor would it be desirable to use extremely rigid steel in which kinetic qualities would be absent. The idea to be conveyed is one, taking into account rigid steel with kinetic ability as a secondary consideration, on the one hand, and highly kinetic steel with rigidity as a secondary consideration on the other hand.

To advance the theme a pace, the deflections resultant of service, considering a given extreme fiber strain, will not be of the same extent for all grades of steel, even though the unit stresses may be relatively the same, or, if the unit stresses are the same percentage of the elastic limit in the respective cases. For a given extreme fiber strain, then, the deflections may be more or less dependent upon the physical characteristics of the materials; to illustrate this point by resort to an example, which for clearness may involve the torsional shear, and the elastic resistance to torsion. To begin with, the polar moment of inertia is independent of the grade of the material, because the polar moment is equal to:

$$J = \frac{\pi d^4}{32} = \text{the polar moment of inertia;}$$

in which,

d = the diameter of the torsional member in inches.

For a 1-inch test piece, then, the polar moment of inertia would be of value as follows,

$$J = \frac{3.1416 \times 1^4}{32} = \frac{3.1416}{32} = 0.0981 =$$

the polar moment of inertia of a round section of the diameter given.

If the polar moment of inertia is a mere matter of dimensions rather than involving the qualities of the materials used, it follows that the differences to be elucidated must be on account of the qualities residing in the materials in such a way that the several materials can be compared using the one size, thus rendering the proof a comparatively simple matter.

Chrome Nickel and Carbon Steels Compared.

In further relation to this matter it is necessary to select the materials to be compared, having in mind the fact that they should be crankshaft materials, so fabricated as to lend stability to the class of work under discussion in a fitting manner.

CHROME NICKEL STEEL.

Physical Properties:

Tensile strength in pounds per square inch	150,000
Elastic limit in pounds per square inch	130,000
Elongation, per cent in 2 inches	12.
Reduction of area, per cent	33.

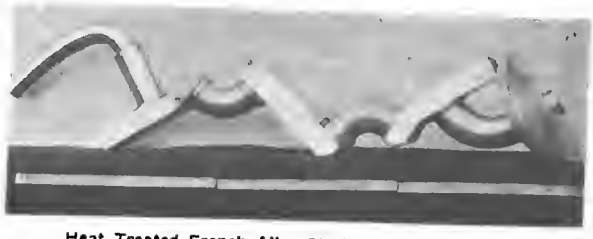
CARBON CRANKSHAFT STEEL.

Physical Properties:

Tensile strength in pounds per square inch	80,000
Elastic limit in pounds per square inch	40,000
Elongation, per cent in 2 inches	18.
Reduction of area, per cent	36.

Taking these representatives of crankshaft materials as showing good in their respective genera, proceed thus:

On a basis of 50 per cent of the elastic limit as the extreme

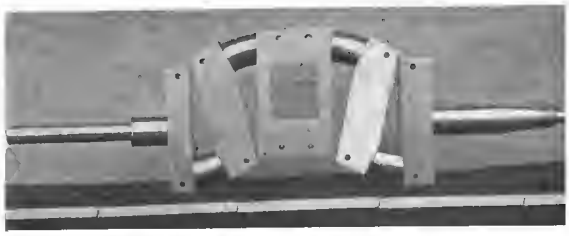


Heat Treated French Alloy Steel After Bending Test.

fiber strain in each case, and representing the same by the letter S, we have:

$S = 65{,}000$ for the chrome nickel steel;
$S = 20{,}000$ for the carbon steel.

The diameter being the same for both materials, viz., 1 inch, tbe value of c may be taken as $\frac{1}{2} \times d = 0.5$ inch, and with these



Balanced Two-Bearing Crankshaft After Test.

data it will be possible to fix upon tbe twisting moment in each case as follows:

Chrome nickel steel:

$$Pa = \frac{SJ}{c} = \frac{65{,}000 \times 0.0981}{0.5} = 12{,}753.$$

Carbon steel:

$$Pa = \frac{SJ}{c} = \frac{20{,}000 \times 0.0981}{0.5} = 3{,}924.$$

In the two cases we have the twisting moments that would follow were the two specimens stressed to the same percentage of the elastic limits of the respective specimens. It is not possible to stop here if anything is to be shown, since the results of these twisting moments were not disclosed. If we investigate the elastic resistance to torsion it is possible the consequences of the applications will be disclosed. Considering the elastic resistance to torsion it is necessary to assign a length to the specimens. Let us assume that the specimens will have a free length of 12 inches, and that the angle due to the torsions will suffice for the purpose.

We have, then,

l = length of proof = 12 inches.
d = diameter = 1 incb.
P = applied force in pounds at the distance a from the axis.
Pa = the torsional moment. Given before for each case.
Θ = angle through which the free end of the specimen is twisted, measured in arc of radius = l, or unity.
*G = torsional modulus of elasticity, taken as $2/5$ E, in which E = modulus of elasticity in tension.

Numerical Examples.

$$\Theta = \frac{32 \times Pa\,l}{\pi\, d^4\, G} = \text{torsional angle measured in arc of radius} = l$$

For chrome nickel steel:

$$\Theta = \frac{32 \times 12{,}753 \times 12}{3.1416 \times 1^4 \times 12{,}000{,}000} = 0.1299$$

For carbon steel:

$$\Theta = \frac{32 \times 3{,}924 \times 12}{3.1416 \times 1^4 \times 12{,}000{,}000} = 0.0399.$$

Having thus fixed the values of Θ, let us now find the angle of torsion α (alpha) for the respective specimens as follows:

$$\alpha = \frac{180 \times \Theta}{\pi} = \text{angle of torsion in degrees.}$$

*The modulus of elasticity for tension hae been assigned values ranging between 27,000,000 and 32,000,000 for steel, with 30,000,000 as a close approximation. The modulus of elasticity is regarded by the majority of steel men as the same for chrome nickel steel as it is for carbon steel; there is some doubt about this, but the proof of a difference is not at hand.

For chrome nickel steel:

$$\alpha = \frac{180 \times 0.1299}{3.1416} = 7^\circ\ 26'$$

For carbon steel:

$$\alpha = \frac{180 \times 0.0399}{3.1416} = 2^\circ\ 17'$$

What do we find? Probably what most of us failed to look for, in our endeavors to discriminate between the suitable products and those to be avoided. At all events, it is plain that the actual deflection in degrees of arc, considering a given percentage of the elastic limit of the respective materials, is greater as the quality of material is increased, if it is true that increasing the elastic limit of tbe material increases the quality, which it does, from certain viewpoints at any rate.

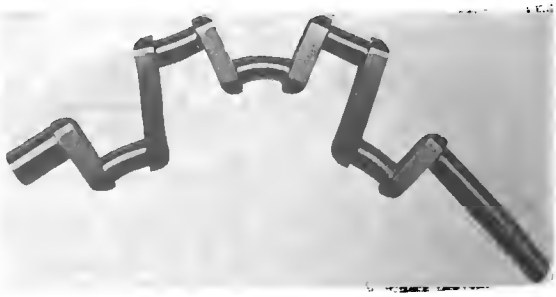
The actual deflection in degrees of arc was found to be (in a foot of length) seven degrees twenty-six and four-tenths minutes for the chrome nickel steel and only two degrees seventeen minutes in the case of carbon steel. To glance at the formulæ is but to discover that this is all that can happen if it be true that the modulus of elasticity is the same for both genera of steel, because, with proofs of the same dimensions, and the same percentage of elastic limit, wbat have we but a diminished deflection in the case of the steel for whicb the Pa value is the minimum?

If, on the other band, the extreme fiber strain were taken the same for the different products, tben the deflection would be the same in both cases. This is to say, the high-priced material would have to be used in the same profusion as the material costing considerably less money per pound to purchase, and a great deal more to fashion into the desired shape. If it is not feasible to take advantage of the increased elastic limit of material, because by doing so the torsional angle will increase, elastic limit over and above the needs would scarcely be a desirable commodity to pay anything extra for. So far, then, the discussion has led to a very unsatisfactory state of affairs with the idea uppermost that investigation would be profitable.

Let us add to the confusion by making the bald statement that there has in the past been a crop of crankshaft failures of the class using the finer grades of alloy steel; let it be understood, too, that the inferior carbon steel products are well represented in the land of failures. Wbat does it portray?

Deflection Proportional to Fiber Strain

We can begin by saying that if the modulus of elasticity is no better for alloy steel than it is for carbon steel, the deflection will be proportional to the extreme fiber strain, and the increased elastic limit of the one will be of no aid, providing it can be

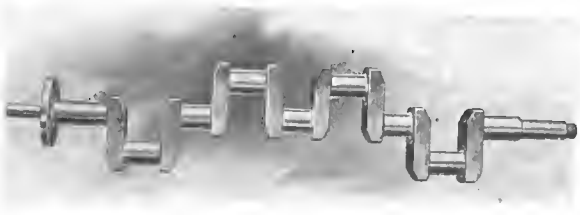


A Chrome Nickel Steel Crankshaft Tested Out.

said that it is the deflection magnitude that must be limited. It is desirable to investigate the several grades of steel and ascertain for sure if the modulus of elasticity is the same for all, or substantially so. Then, again, it would be desirable to know if deflection magnitude is the real measure of life, or can we say the deflection is a matter of no moment if the extreme fiber strain does not exceed a certain percentage of the actual elastic limit of the material used in any given case?

In the design of crankshafts, if deflection is the matter of moment, it is only necessary to remember that the deflection, under constant conditions, is inversely proportional to the fourth power of the diameter of the shaft; the formula may be written:

$$a^{\circ} = \frac{180 \times 32 \times Pa \times 1}{\pi^3 \times d^4 \times G} = \text{angle of torsion in degrees.}$$



A Good Example of Current American Practice.

This is to say, it would require but a very slight increase in the diameter of a member to reduce the torsion angle a very considerable amount. At all events, it is possible to explode a theory so oftentimes cited by designers of even "national" reputation, who are fond of saying, "If a crankshaft is made of very strong material it will not deflect and the tendency to deterioration will not even exist." What they mean to say is: no distortion, no deterioration. That it is their custom to use less of the high-priced material than they would of low-priced material, is an assured fact. Under such conditions as has been here shown they have deflections of considerable magnitude in excess of the deflections that will actually obtain in the cases of the inferior steel of a somewhat greater (or even the same) section. It may seem odd to say that the rigid, high-priced material is likely to deflect more than the comparatively weak, and, in a sense, inferior steel, but is it really so wonderful? How about spring steel? Is it not far better than steel castings? Who will say that a steel casting will so readily deflect as will spring steel?

The steel casting can be of exactly the same composition as the spring steel; what is the real difference? In the mode of fabrication, of course. As steel castings go, 'tis a fair statement to say, the composition that produces a sound casting of excellent quality, would result in a good spring; changing the mode of fabrication to suit.

In other words, good material makes good castings, or, good springs. The process must suit the ultimate ends in each case, which is another way for saying, crankshafts to be good, must be of the raw materials good for the purpose, suitably fabricated.

In a spring, we want high carbon, but, since a crankshaft is, to be sure, the reverse of a spring, do we want high carbon? Probably not; do we want low carbon? Very likely; why?

In the first instance, the absence of carbon renders the steel easy to work and difficult to injure during its manipulation. Certainly these are good points; they are not all.

The kinetic ability of steel is of the greatest importance if the steel is to be used for crankshafts, if it is true that the deflections may not be aborted. It is a moral certainty that the deflections do abound, irrespective of the grade of steel used in the count as herein before stated and for other reasons besides.

Low Carbon Content Desirable.

With the carbon content below, say, 16 points, it is quite out of the question to consider that the steel will be difficult to manipulate because of the carbon content. True, it would be desirable to depress the carbon content even more under certain conditions. That is to say, if the steel is alloyed, and the physical properties are buoyed up to the desired point without the aid of carbon, or, without having to consider the tendencies of the carbon content, the lower the carbon in the steel the better it will be from the kinetic point of view. If the deflections cannot be eliminated, the greater the kinetic ability, the longer will the crankshaft serve for the purpose, which is no license to increase the extreme fiber strain to any extent at all, even if the steel used has a high value of the elastic limit.

A Swedish iron crankshaft, in which the carbon might run as low as five points, would scarcely work in a manner satisfactory, primarily because the modulus of elasticity is considerably lower than that which should obtain, with the result that the section would have to be increased to a point beyond that possible in nine cases out of ten. If the section could be increased, the iron shaft might be the peer of them all. It is not necessary either to employ steel high in carbon, or iron so low in carbon as to affect the modulus of elasticity (if it is the absence of carbon in the iron that does account for the lowered modulus), since it is possible to so alloy steel as to render the same of considerable strength even though the carbon content may be under ten points, as it is in some of the finer grades of "cementing" nickel steel, and in some grades of alloy steel as used in crankshaft work, of the best examples.

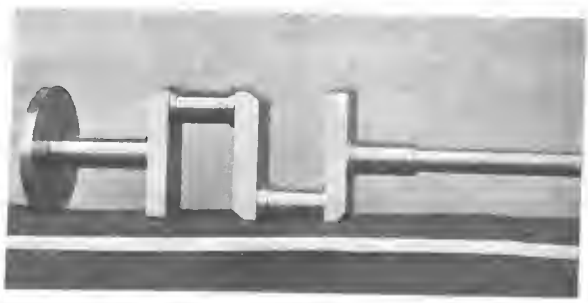
The dynamic life of steel is limited, of that there is now no question at all. Instead of the life as inversely proportional to the extreme fiber strain, the same life decreases much more rapidly. Under the circumstances it is a fallacy to fix the extreme fiber strain at a high level.

If a crankshaft would last forever were it large enough to resist all deformation tendencies, it would be too large to use, for the reason that the rest of the car would fail to last so long. On the other hand, if the metal of such a shaft were to show a value of, say, 1,500,000 alternate shocks under a stress of one-half the elastic limit, to so design the shaft as to have it work at that stress would assuredly be bad practice, since the death of the shaft would be too much to keep continuously in the mind's eye.

The Extreme Fiber Strain Should Be Low.

By designing such a shaft, so that the extreme fiber strain would be one-tenth instead of one-half of the elastic limit, the death of the shaft would be a remote contingency. The shaft would be one of the parts to fail last of all in a car; in view of its cost, and the damage done by a failing shaft, to make it the least likely to fail in service is to be right. In quest of high kinetic ability, which seems to be of the greatest importance, it is more than high elastic limit that is desired. If we say the utility of a product for the purpose depends upon the relations of the physical properties, we may be more or less right, since by so manipulating steel as to alter the relations of the physical properties we are able to increase or decrease the kinetic properties at will.

Obviously "burnt" steel stands the lowest in the scale of kinetic ability. The next in order is quenched steel. It will be observed



Balanced Double Opposed Crankshaft.

that as the elongation decreases the kinetic ability decreases; in what ratio, the author is not at the moment prepared to state. The elastic limit can hold at a constant value for two specimens to be compared, and the one of the two having the greatest elongation will be the one with the greatest kinetic ability. In this may be seen the great desirability of the maintenance of high elongation.

(To be continued.)

TWELVE YEARS' PROGRESS IN COMMERCIAL VEHICLES*

By E. SHRAPNELL SMITH, Treasurer of the Commercial Motor Users' Association.

THERE were, 12 years ago, no commercial motors in existence. The range of to-night's paper may, therefore, embrace every stage of evolution, and numerous instances of misapplication. One is reminded by the presence in the chair of Sir David Salomons, Bart., of the interesting demonstration which he organized 13 years ago, at Tunbridge Wells, on the 15th of October, 1895, when the De Dion-Bouton steam tractor presented for the first time the embryonic details of a system which might well have been more successsfully developed for commercial purposes. One year later, on the 26th of October, 1896, Sir David inaugurated the North of England branch of the Self-Propelled Traffic Association by the delivery of an address at the Liverpool Royal Institution. On that occasion he was unable to indicate a single vehicle for utility purposes, which fact is now quoted in confirmation of the opening sentence of this paper. Liverpool merchants and shipowners in September and October, 1896, were particularly anxious to obtain information about the prospects of this branch of motoring, but neither Mr. Sennett, who read a paper before the British Association meeting, nor Worby Beaumont, who addressed the Incorporated Chamber of Commerce, was able to adduce one example of practical application. Mr. Beaumont concluded his address with this statement: "Great as the premises are of motor vehicles for light work, I am satisfied that the commercial motor vehicle for heavy traffic has yet to be designed." A year later, when Mr. Beaumont, on the 26th of November, 1897, opened the second session at the Liverpool Royal Institution, he was able to describe early Coulthard, Leyland and Thornycroft vehicles, a petroleum spirit lorry by the Anglo-French Company, and a Serpollet type lorry which had been constructed by Messrs. Samuelson, of Banbury; he also spoke highly of the Scotte and De Dion-Bouton vehicles of 1897; yet there was meager evidence of advance.

The situation 11 years ago was, accordingly, one of non-application, but there had been efforts to encourage the construction of self-propelled vehicles of all kinds. The principal of these was essayed by the proprietors of the *Engineer*, which announced, on the 5th of July, 1895, an 1,100-guinea competition for motors of all classes. Two of the classes, in respect of which prizes (value £400) were offered, were open to commercial vehicles. One of these was for a vehicle which should be capable of carrying not more than one ton of goods, in addition to the driver, and of which the gross weight should not exceed two tons; the other was open to vehicles which were capable of carrying 5 cwt. of goods, in addition to the driver, and which did not weigh more than one ton gross. After a postponement, it was decided to carry out the tests at the end of May, 1897, with a practical run from London to Birmingham and back, in addition to others. From a total of 17 entries in the commercial sections, only one van was presented at the Crystal Palace, this being a steam-driven vehicle by the Liquid Fuel Engineering Company, Limited, of East Cowes. The entries by the Clarkson, Coulthard, Leyland, Merryweather and Thornycroft firms did not lead to the arrival of the vehicles themselves.

A second competition was announced in September, 1896, by the Royal Agricultural Society of England. Two classes were arranged: one for vehicles to take the place of light spring carts, and to carry loads "up to two tons"; the other for vehicles "capable of taking five tons." Three entries were received for the lighter class, and none for the heavier class, but only the Leyland van reached Crewe on the 10th of June, 1897, for tests at the hands of the judges. The practical collapse of these two competitions was very disconcerting to those who had a belief in the future of the commercial motor, but plenty of evidence was subsequently forthcoming to show that builders and designers, notwithstanding the tremendous difficulties by which they were confronted, were able to make headway.

It is not, of course, possible to include a complete historical retrospect in this paper, even were it desirable. The object is rather to put on record certain facts which must be held to support the contention that there has been a remarkable and satisfactory growth in the number of successful instances of use for commercial purposes. It is open to anybody who desires to make a closer study of successive developments to turn up a paper on the subject of "Heavy Motor Traffic," which was read in this room, under the chairmanship of Sir John I. Thornycroft, on November 5, 1903, since which date the opportunity for the wider employment of commercial motors, whether vehicles or or tractors, has been increased by reason of the less disadvantageous conditions of the heavy motor car order, 1904. Before that order came into force, on March 5, 1905, the unladen weight of any motor car might not legally exceed 2 tons 19 cwt. 27 lb., while any development of public-service vehicles was virtually prohibited by their falling within the speed limit of five miles an hour. To-day's legal position is not entirely satisfactory, but it is, none the less, one under which a large measure of advance has been rendered possible and has been achieved. It is not out of place, in these circumstances, to acknowledge the influences which brought about the issue of that order, and to congratulate this club, the Commercial Motor Users' Association and the Society of Motor Manufacturers and Traders upon the manner in which they harmoniously co-operated to secure the ends in view.

The Testimony of Public Trials.

There is a sharp division of opinion as to the continued value of road trials under independent observation. A debate on this subject took place a few weeks ago at a meeting of the Society of Road Traction Engineers, when a motion to the effect that their value is *nil* was defeated by a large majority. The accompanying table has been specially prepared, with the object of showing the improvement to which such open trials testify, and attention may more particularly be drawn to the column which

*Paper read before the members of the Royal Automobile Club, London, November 26, 1908.

PROGRESS OF THE COMMERCIAL VEHICLE—SUMMARY OF, AND LOST MILEAGE IN, CERTAIN COMPETITIONS.

Year	Organizing Body	Number of Machines				Motive Powers at "Finish"		Maximum Load Carried, Tons	Maximum Scheduled Mileage Per Vehicle	Percentage of Miles Lost	Prizes	
		Entered	Presented	Started	In at Finish	Steam Propelled	Internal Combust'n				Offered	Awarded
1897	*The Engineer*	17	1	*	*	..	..	..	..	..	£1155	Nil
1897	R.A.S.E.	3	1	1	1	1	..	0.5	100	†	£300	Silver Medal
1897	A.C.F.	15	12	10	7	5	2	5.5	192	22.4	None	None
1898	L.S.P.T.A.	10	4	4	4	4	..	4.7	143	14.7	£225	£225
1901	L.S.P.T.A.	13	11	9	8	6	2	6.3	168	12.0	Medals	Medals
1905	A.C.F.	65	57	57	50	2	48	7.1	555	9.5	"	"
1907	R.A.C.	60	59	56	50	11	39	5.0	1582	7.3	"	"

*Competition abandoned. †Judges reduced test run to one of 12 miles.

sets out the percentage of lost mileage. Not every competition is included, but there are sufficient for the purpose, and none of tbese bave been picked to suit the occasion. Tbey constitute a representative series, and examination of the figures must be held to establish a very good case for the utility motor. It will be observed that, going back eleven years, no less than 22.4 per cent. of the attempted mileage was not accomplisbed in tbe first "Poids Lourds" of the French Club; the first trials at Liverpool resulted in a loss of 14.7 per cent.; tbe third trials at Liverpool, in 1901, demonstrated an improvement to 12 per cent.; the big French trials of 1905 showed 9.5 per cent. of lost mileage; the largest commercial motor trials which the world has known, those which the Royal A. C. organized in the fall of 1907, gave the really splendid result of only 7.3 per cent. of lost mileage. No dispassionate man of business can afford to ignore these proofs of steady progress toward reliability. My own view is that necessity for such trials is over; they have admirably served tbe purposes and no more are wanted.

The Testimony of the Satisfied User.

It goes without saying that a not inconsiderable proportion of those who, during the years 1899 to 1902, purchased vans, lorries or other commercial motors were disappointed in the results which they obtained, and one may cut a long and somewhat painful story short by stating that every pioneer buyer passed through the most troublous of vicissitudes. One might cover pages with mechanical faults, inefficiency and financial loss which fell to tbe lot of those who bought a few years too soon. The memory is naturally unsavory, but it is shortsighted for any people with baulage interests to be influenced by old and out-of-date results. These references apply to occurrences wbich were experienced only from six to nine years ago, but it must be remembered that improvements in the heavy section of the industry have been not one whit behind those in connection with the lighter branches. In proof of this assertion, it is satisfactory to be able to produce evidence of the revulsion of feeling in favor of the business motor during the last few years.

By the courtesy of tbe proprietors of the *Commercial Motor*, I bave full access to a very complete list of owners. This list is subdivided into 16 classes, as follows: (1) Bakers and flour dealers; (2) brewers; (3) brickmakers; (4) building contractors; (5) cabinet makers, general furnishers and stores; (6) carriers and transport companies; (7) gas companies; (8) hotels (omnibuses); (9) laundries; (10) market gardeners and fruit growers; (11) millers; (12) mineral water manufacturers; (13) municipal and other local authorities; (14) provincial omnibus companies and proprietors of chars-à-bancs; (15) quarry owners, and (16) various manufacturing and other trades. Communications were addressed a few weeks ago to over 700 owners, and the figures in the second table controvert any suggestion tbat purchasers are not increasing the number of their motors or are becoming disgusted with the machines which they have acquired. The summary of the 342 replies is in structive and really conclusive. It is not suggested that these tabulated increases furnish a complete census of return, for many owners are either independent or indifferent when requests of this kind reach them. Some think it unnecessary to reply; others regard the data as peculiar to their own businesses and not to be divulged, and tbe names of a fair proportion are retained only by the clerks to the registration autborities. It is justifiable, notwithstanding the admitted deficiencies, to claim that the 342 replies in question are of a representative character, and in no sense selective, for nothing has been held back. Eight owners, and no more, gave adverse opinions.

Two correspondents who are large owners of vans and lorries, respectively, Messrs. James Shoolbred & Co. and the Eastern Motor Wagon Company, Limited, have given permission to me to quote their actual records of lost mileage for the last twelve months. Messrs. Sboolbred, for 30 vans in the four montbs ended February last, and for 31 vans in the eigbt months ended October last, lost a total of 562 van-days in a possible total of 9,446 van-days, or less than 6 per cent. No overtime work is done on tbese vans, and no mecbanical night staff is kept; further, "vans off the road" includes all accidents, all tire repairs, all time occupied in repainting and revarnishing the bodies, and all adjustments and maintenance of the chassis. The firm bas done its own overhauls, since January 1, 1907, and it keeps only one engineer, one junior and two mechanics, for the whole supervision and running of a total fleet of 37 vans; the six newest ones are purposely omitted from the foregoing analysis. The summary is that tbey have kept in 1 4-5 vans per day throughout the year, one of these being in for its regulation overhaul, and tbe average of 4-5 van being in for small repairs. This performance may be stated as less than one spare van for each 16 owned, and full work continuously from the rest of the fleet.

The Eastern Motor Wagon Company, Limited, now has twenty steam wagons in regular service throughout the metropolitan area. Half of these work on the basis of a fixed five days per week (about 70 hours of service) under contract, each Saturday being reserved for examinations, adjustments, cleaning and the like, and to give tbe drivers, some of whom average as much as 250 miles per week, a rest. The others work six days a week. The growth of this company's fleet bas taken place as follows: 1905, three wagons; 1906, eight wagons; 1907, twelve wagons; 1908, twenty wagons. Of these machines, nineteen carry five tons eacb wben used without a trailer, and haul tbree tons more when a trailer is used, which is generally the case. The other machine is a rubber-tired vehicle, for loads of about three tons, and it averages 300 miles a week. The company's experience sbows that the lost journeys are less than 5 per cent. of the maximum. This compares with about 10 per cent. in the years 1902-1903. The improvement is partly attributed to the progress in construction, but so reasonable a loss as 5 per cent. cannot be maintained, especially in contracting work, without capable administration, efficient mechanical supervision and proper facilities for the making of overhauls and adjustments.

Omnibuses for City and Country Uses.

The development of motor bus traffic in London, and generally in various parts of the country, has specifically occurred within the last four years. The totals of motor buses in the metropolis have been, at October 31 in eacb of the four periods of twelve months now ended: 1904, 15; 1905, 162; 1906, 754; 1907, 917, and 1908, 1089. The motor bus, as did the steam lorry and the one-ton van in earlier years, quickly gave rise to much trouble for those who became its pioneers. In London heavy losses have been incurred, and these are attributable to several causes, of which five may be quoted: Excess of traveling facilities over public demand; the cost of training drivers; tbe absence of experience on the part of the managements; the excessive working hours, and, in some cases, unsuitable material, incorrect gauging and bad fitting. It is unnecessary to labor any of these points, but it may be some consolation to shareholders to know that matters are now vastly improved, and that there is every reason to believe that the original estimate of an inclusive working cost of 10½d. (21c.) per mile will prove to be ample. Skidding and side-slipping difficulties have yet to be overcome, altbough improved driving has greatly reduced the incidence of claims, but this is still the largest uncertain factor wbicb attacbes to the business of motor bus operation at the present day.

The accumulator-driven omnibus has been on the streets of London for sixteen months and has proved that 2d. (4c.) per vehicle mile is ample for battery maintenance.

So far as country motor bus services are concerned, the most satisfactory reports are those from railway companies, and it has to be admitted that a number of smaller undertakings have come to grief. Against these cases of failure, however, it is only rigbt to note that others have paid moderately, and that the use of motor chars-à-bancs is on the increase for touring and pleasure parties. Such country services appear to require, in a number of cases, a fare basis of not less than 2d (4c.) per passenger-mile, but this is not excessive, baving regard to convenience.

There are not less than sixty motor vehicles now under contract for the conveyance of His Majesty's mails, as compared with two —in the parcel mail between Liverpool and Manchester—in the year 1902. This service is practically limited to the parcel mail, in respect of which the railway companies of this country charge an all-round rate of 0.55d. (6.1c.) per lb., station to station. It is obvious that the Crown is paying a rate which admits of huge economies, although the contention of the railway companies, that the rate does not pay them in the case of odd parcels which have to be conveyed between points at opposite ends of the United Kingdom, cannot be overlooked. There is, however, only a low percentage of "lean" work. In any event, the postal authorities are certainly not unwilling to pay as much as 1s. 3d. (31c.) per vehicle-mile for a two-ton van, but competition between the contractors has already witnessed a cutting of this rate to below 1s. (25c.), a state of affairs which can only be regarded as wholly unnecessary. No breach of confidence is being committed when it is put on record that the next few years will unquestionably witness a very large development of the motor mail, both in this country and in certain of our colonies, in conjunction with passenger conveyance. In the London-Brighton service, which is conducted by Thomas Tilling, Limited, only two journeys (119 miles) were lost out of a possible 1008, aggregating 59,976 miles, or a mileage loss of 0.198 per cent. On the London-Hastings and London-Cambridge routes, for which Milnes-Daimler, Limited, contracts, only 72 miles were lost out of a possible 46,264, or 0.155 per cent.

Few people realize that the motor cab has jumped into popularity in so short a period as twenty months, but this is a fact. It was only on March 21, 1907, that the General Motor Cab Company, Limited, gave an inaugural luncheon and immediately placed upon the streets of London the first seventy Renault cabs which marked the departure from haphazard and small-scale exploitation in favor of a big organization on a truly commercial scale. The motor cab, as a means of locomotion in London, is no new proposition. For example, one may recall the yellow-bodied electric cabs of 1897, which so quickly came to grief. Many critics in the summer of 1906, when only comparatively few of these mechanical hackney carriages were on the streets of the metropolis, expressed the view that the motor cab was not needed, in view of the convenience and speed of the motor bus. That estimate of the situation was a false one, and the privacy of the motor cab, apart from its greater speed and range, necessarily prevented the motor bus from being at any time a competitor. It may be of interest to quote the totals of mechanical hackney carriages for which licenses were in force in the metropolis at certain dates: December 31, 1903, 1; December 31, 1904; 2; December 31, 1905, 19; December 31, 1906, 96; September 30, 1907, 604; December 31, 1907, 723; March 31, 1908, 958; September 30, 1908, 2,273.

The practice in London is to pay the driver 25 per cent. of the registered takings, in addition to any gratuities which he may receive, out of which payments the driver has to pay for his own motor spirit. This revolutionary change in the habits and customs of the London cab is proceeding apace, and the men appear to have accommodated themselves to the alterations with remarkable quickness. The proportion of ex-horse cabbies in the employ of the General Motor Cab Company, Limited, is no less than 67 per cent. Prior to the advent of the motor cab these men used to pay jobmasters so much a day for the use of a vehicle and one or more horses, and to keep any balance of earnings for themselves.

Costs and Performance.

The undeniable progress of the last few years is measured by higher performance in relation to cost. The cost per vehicle-mile is uniformly less in each class for equal loads than it was even a couple of years ago, while lost earnings and disturbance of business generally are virtually disappearing factors in the problem. It was necessary, four or more years ago, for the purchaser to accept a great number of uncertainties. He paid a high price for the machine in the first instance, and he did not know what it was going to cost per annum. To-day the purchaser is in a happier position. He can, in many cases, obtain guarantees as to maintenance, whether of rubber tires or of the mechanical parts; he can obtain written assurances from users who have been employing vehicles of the same make; he can obtain drivers who have had experience on the road—a qualification which is certainly necessary for men who have to go far, and particularly for those who are in charge of steam wagons; he can associate himself with a powerful central organization, which now numbers upward of 320 members, in the shape of the Commercial Motor Users' Association, and that at the reasonable annual subscription of one guinea; he can obtain low and inclusive insurance rates, unless exceptional risks are involved. Briefly, he can take his choice, in the following classifications, with the knowledge that his total outgo per vehicle-mile will not exceed amounts indicated—one-ton van (petrol.), 5d. (10c.); two-ton vehicle (petrol.), 6½d. (13c.); three-ton lorry (petrol.), 8d. (16c.); five-ton tractor (steam), 8.5d. (17c.); five-ton tractor (steam), 9.5d. (19c.); five-ton wagon (steam), with trailer, 1s. (25c.).

In conclusion, I desire to emphasize two points upon which I feel very strongly. The first of these is that nothing has occurred to weaken my conviction that steam is the better power for loads in excess of three tons, except in circumstances where the higher speeds due to the use of rubber tires are of marked advantage; the second is that any contractor, who purchases one or more motor vehicles or tractors for the purposes of hire must, if he is to make any money and not to go bankrupt in a couple of years, obtain at least 60 per cent. more per mile under contract than is set forth in the preceding paragraph, where the typical costs are for owners who can find practically full work.

ANALYSIS OF 342 RETURNS FROM OWNERS OF COMMERCIAL MOTORS.

Classification	No. of Returns Received	Growing Net Totals for These Users											
		1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908
1 Bakers and flour dealers	12	..	..	..	1	1	1	2	6	9	12	17	42
2 Brewers	31	..	..	3	12	19	34	40	62	77	85	102	113
3 Brickmakers	17	..	..	..	..	4	4	7	12	20	25	32	37
4 Building contractors	14	..	..	..	..	1	3	8	10	31	38	49	56
5 Cabinetmakers, general furnishers, and stores	23	..	..	1	2	7	9	13	19	40	65	106	151
6 Carriers and transport companies	34	..	..	..	..	..	26	64	67	129	179	212	234
7 Gas companies	11	..	..	..	..	..	..	2	3	10	17	27	31
8 Hotels (omnibuses)	16	..	..	..	..	..	..	2	5	7	7	14	20
9 Laundries	12	..	..	..	..	..	..	2	5	7	18	23	26
10 Market gardeners and fruit growers	15	..	..	..	..	..	..	5	6	13	19	20	21
11 Millers	37	..	..	..	..	..	1	4	10	16	19	20	21
12 Mineral water manufacturers	9	..	..	..	5	11	17	24	33	40	52	66	77
13 Municipal and other local authorities	42	..	..	..	..	..	2	3	3	5	9	14	15
14 Provincial omnibus companies (and proprietors of chars-à-bancs)	23	..	..	2	6	8	20	32	42	54	73	84	94
15 Quarry owners	12	..	..	..	..	..	..	7	61	155	205	238	276
16 Various manufacturing and other trades	34	..	..	..	..	1	3	4	6	10	12	14	18
Totals	342	..	1	2	2	3	6	10	20	30	37	65	82
		..	1	8	28	55	126	227	365	646	853	1083	1293

ABOUT THE AUTO'S INDISPENSABLE FOOTWEAR

WHILE much is made of tire troubles, too little is said or heard of the virtues of the automobile's indispensable footwear. With a little care and attention tires are capable of much better and more economical performance than they are generally credited with rendering.

The first precaution to be taken by the autoist is to keep his tires inflated at proper pressure, as nothing will wear them out as quickly as running on them half inflated. Roughly speaking, a tire is properly inflated when it will stand up full and round under the pressure of the loaded car.

Novices are always afraid of inflating their tires too much, with the result that they rarely inflate them enough. They are very much in the wrong, for an ill-flated tire rapidly wears out. Few hand pumps are capable of exercising a pressure of 100 pounds per square inch and good tires can stand a pressure at least equal to that, so there is slight danger of over-inflating.

But every autoist should have a pressure gauge so as to be able to determine the exact amount of pressure in his tire. Following is a table of approximate pressure for tires:

50 pounds in 3 inch tires.
60 pounds in 3 1-2 inch tires.
70 pounds in 4 inch tires.
80 pounds in 4 1-2 inch tires.
90 pounds in 5 inch tires.

The rear tire should be inflated 5 to 10 pounds higher than above table. Improper inflation is the commonest cause of rim-cutting. During the first ten days they are used tires should be frequently inflated, as the cover increases progressively in volume for the first ten days or so, and the air pressure is thus diminished. After this period, or when the cover has reached its full dimensions, it will be sufficient to pump your tires every ten days or three weeks. If more frequent pumping is necessary something is wrong; a leaky valve or a "slow" puncture.

Of course, a deflated tire should never be driven on, as there is not only the certainty of damaging both tube and casing beyond repair, but the danger of loss of control and serious accident if high speeds are indulged in. An entirely deflated tire is easily detected by the unusually sharp jars transmitted to the body of the car, but often a "slow" puncture is not detected until considerable damage has been done by rim-cutting. If the following is borne in mind the deflated tire may be detected before enough deflation has taken place to cause serious damage:

A deflated front tire will usually make itself known by the difference it causes in the sensitiveness of the steering apparatus. A deflated rear tire, especially if there be much weight in the rear of the car, often gives a peculiar "feel" to the steering wheel, as if the vehicle were traveling over a greasy road. The rear of the car swings about abnormally with a slight skidding tendency. When a driver feels this sensation on a good dry road he should think of his rear tires.

Care of Tires in the Garage.

Should the car be much in use it is preferable to leave the tires inflated, but if the car is not used for some months it is better, after having placed jacks under the axle, to partially deflate the tire. If this is done it will add greatly to the life of the tires, as they are then bearing only the pressure of the air with which they are inflated, which is very slight, whereas when supporting the weight of the car this is exerting a continual unnecessary strain on the walls of the cover and the pressure of the air in the tire also exerts more or less of a strain. By adopting this course it is estimated that the life of the tires will be increased by at least half the time the car stands idle. Never allow the car to stand with one or more tires deflated without jacking it up to relieve the pressure.

In winter it is best to remove the tires from the wheel, and after being sure that they are perfectly free from oil, water, etc., wrap them with a soft cotton cloth to keep out the light and store them in a place of moderate temperature. Or the tires may be deflated and left on the wheel and then wrapped in cloth and the car stored in a place of moderate temperature.

Be sure the size of the tires is equal to the weight of the car. The limit of weight which each size tire will stand is given by the makers of it. Improper attachment of a clincher tire to the rim is certain to result in trouble before many miles are covered, as the inner tube is pretty sure to be caught between the shoe and the rim, or between the shoe and a retaining stud, the result of which is the well-known "pinching." The portion of the tube near that which is caught is subjected to increased strains, while in a stretched condition, and the tube will soon burst or tear at the point of pinching. If the outer shoe is not caught properly between the rim and stud, great damage to the shoe may result, and in the case of many tires, the inner tube may blow out through the space between the shoe and the rim near the improperly set stud.

Natural Enemies of Rubber.

It should be kept in mind that tires have three natural enemies that are destructive to rubber; light, heat and oil, to which might also be added, water. Light and heat have a chemical effect upon rubber, causing very speedy deterioration. Oil, especially gasoline, is a ready solvent for rubber, and will rot the tire quicker than any other substance. Water tends to rot the canvas in the shoe, rust the rim, and destroy the rubber. It should be remembered that wet tires are cut very easily, so that it behooves one to be very careful while running a car on muddy or wet roads.

Heating of Tires While in Use.

It is well known that in a long run the tires become considerably heated, but the cause for this is not so well known. The heating is the direct result of the frictional action between the outer shoe and the inner tube. It can be in a large degree avoided by rubbing French chalk over the inner tube before it is inserted into the shoe; this acts as a lubricant and reduces the friction between the two surfaces to a minimum, and, consequently, diminishes the amount of heat generated and the amount of wear experienced.

Spare Tires and Their Care.—Extra Shoes.

An extra outer shoe should always be a part of an autoist's car equipment. But it should be thoroughly protected against light, heat, oil and dampness. Many a tire that has never been used is ruined by being carried on the car in such a way that water is collected in the tire every time the car is washed or run in a rain storm, and becomes soaked into the fabric of the tire. It is necessary to keep the extra outer shoe covered in some way, so that is may be protected against not only light, heat, oil and dampness, but against dust and chafing as well.

Several extra inner tubes should also always be part of an autoist's car equipment, and care should be taken to see that no deterioration takes place before they are put into use. To put an inner tube, uncovered, into a box full of loose tools, oil cans, etc., is only a little better than throwing it away. The tools will chafe and the oil will rot it, so that if it holds air at all when inflated, it may soon burst under the weight of the car.

Tire Repair Parts.

A tire sleeve is often of much value where a pit is occasionally in the casing, as it will give the tire external support and prevent the bursting through of the inner tube. In lieu of a tire sleeve it is possible to obtain the same results for a time by the use of a strap, which may be wound about the tire, but the

From a little book by C. A. Shaler Company, Waupun, Wis., makers of vulcanizers and tire repair materials in general. The information is so pertinent and so full of sound common sense that the temptation to give it wider circulation is irresistible.

leather sleeve is more substantial. The strap or the sleeve should not be applied with the air in the tire at a higher pressure than 15 pounds. After it has been put on, however, the tire requires to be pumped up again, and a strong well-made pump, even if it costs a little more than seems to the uninitiated to be a reasonable price for such an instrument, will soon pay for itself in the satisfaction it gives.

It should be kept in mind, however, that tire sleeves and the like are for temporary repairs only, and that the injured tire should be vulcanized at the earliest possible moment. To quote the manager of one of the largest tire factories in the world: "A tire sleeve does not perfectly conform to the shape of the tire; water and sand get into the injured portion of the cover and thereby rot the fabric, and eventually the cover will be made useless."

Another very valuable device for an emergency repair of a blow out in the blow out patch, composed of fabric and rubber, which can be placed between the tube and the casing to prevent the tube from blowing out through the hole in the casing. If a tire sleeve is placed over the hole, the repair is still further strengthened. Tire repair plasters made of fabric are also made to go between tube and casing, in the event of a small hole occurring in the casing. They are quite similar to the blow-out patches, but are much smaller. Another handy little device and one that is quite ingenious, is the tire repair plug; a mushroom shaped rubber plug which can be inserted into a pin-or-nail-puncture, and which will for a time prevent leakage without the use of cement.

Quick Repairs for Inner Tubes.

For the smallest puncture a patch two inches in diameter should be used. The surface of the tube should be thoroughly cleaned for a space at least one-half inch larger in diameter than the patch to be applied, by first rubbing hard with a bit of waste or cloth moistened with gasoline, until all traces of "bloom" or the French chalk on the tire have been removed, and then slightly ruffing up the surface of the rubber with very fine sand paper. It is best to use the prepared patches which are procurable from the tire makers, but if a patch be cut from an old inner tube, this should be carefully treated on the underside in the manner indicated above, and the edges bevelled. It is better to cut the patch in circular shape, as a square patch will start to come off comparatively easy at the corners. Cover the patch and the clean place on the tube with a thin coating of high grade heavy rubber cement (inferior grades are worse than useless) and allow it to dry thoroughly. Then apply a second coating. When the second coating has become "tacky" (i. e., not moist, but so that it will stick to the fingers when touched) the patch can be applied. Hammer it well with a bit of wood and allow it a minute or so in which to "set" before pumping air into the tube. If this is not done, failure is almost sure to issue. It is also very necessary to wait until the cement is quite dry and tacky before applying the patch. There is no cement for cementing rubber that will withstand any considerable degree of heat, so that nine times out of ten the cement patch will work loose while the car is running at a high rate of speed with great danger to the car and its occupants.

Quick Repairs for Outer Casings.

In the case of a nail puncture, the hole in the outer shoe should be covered by sticking on a bit of prepared canvas which the tire makers can supply, to the inside of the casing, in order to prevent sand, water, and dirt from working in between inner tube and outer casing. To do this the same rules must be followed as in the case of applying a patch to the inner tube.

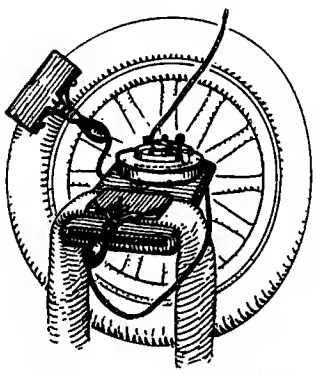
In event of cuts which extend through the outer shoe, a strip of canvas sufficiently wide to cover the cut completely and to extend beyond on each side, and long enough to catch between the shoulder and the outer rim, should be fitted on the inside of the shoe before the inner tube is inserted. This strip should fit closely to the inside of the shoe, and it is well to attach it for at least a part of its length by using cement. The object of this strip is to prevent the tube from blowing out through the cut, and it should, therefore, be drawn sufficiently tight when the tire is attached to the rim to form a supporting band about the tube. Of course, if one has the tire sleeve, or blow-out patch before mentioned, they should be used.

In replacing the tire, the inner tube should be rubbed well with French chalk and inserted, if possible, in such a manner that the patch on the tube will not come against the patch in the shoe, and care should be used that the loose ends of the canvas strip are securely caught between the shoulder of the tire and the edges of the rim. After a slight inflation the tire sleeve, previously described, should be placed tightly around the tire and rim at the point of injury. A make-shift for this tire sleeve is a piece of ordinary "duck," which can be wound about the injury and tightly fastened to hold it in place.

Most Important Tire Tool for the Autoist.

Every autoist should have a vulcanizer, not for a roadside repair kit, but for actual work in keeping his tires in absolutely as perfect condition and appearance as they were the day he bought them. By the use of a good vulcanizer any cut, puncture, tear, or slit in an inner tube can be mended in a very short time, so that the mended portion is even stronger than the balance of the tube. By the use of a good vulcanizer the autoist can save 75 per cent. of his tire repair bill, and get three times the wear that he ordinarily would get out of a set of tires. Think what this means. You can keep the stone cuts in your casing filled in and repaired so that both their strength and appearance is the same as when the tire was purchased. Keeping the casings filled in in this way will absolutely prevent sand pockets and will do away with practically all blow-outs, for it is very seldom that a blow-out takes place in a perfectly sound portion of the tire.

A blow-out invariably occurs where there has been a weakening of the fabric by the rubber having been cut, and sand, dirt, and water having been allowed to creep in, tear away the rubber, and rot the fabric. It will mean more to the autoist than any other thing he can do to go over his casings from time to time, say once a month, and repair each cut in the casing, no matter how small.



The Shaler Vulcanizer Shown In Service.

The tire does need to be removed from wheel, or wheel from car. The hole is cleaned with gasoline and sand paper, and a coating of vulcanizing cement smeared in and around the cut. The cement is allowed to dry and the hole is filled with crude rubber. The vulcanizer is then clamped onto the casing by means of a chain and bolts, after which the wheel is jacked up and enough air let out of the tire, so that when the vulcanizer is snugly bolted to the tire, it will conform exactly to the concave face of the vulcanizer. The vulcanizer is left in this position for thirty minutes at a temperature of 250 to 275 degrees Fahrenheit.

Tubes are repaired in much the same manner. The tube is cleaned, cemented, and pieces of crude rubber, as nearly as possible conforming in size and shape to the hole, placed in the hole, and a final piece one-eighth of an inch all around larger than the hole placed over all. The tube is then placed on a shelf, furnished with the vulcanizer, and the flat side of the vulcanizer clamped down on the tube. Vulcanization takes places on the tube in about fifteen minutes.

LETTERS INTERESTING AND INSTRUCTIVE

ONE MOTOR CAR CAN BE SLOWED QUICKLY.

Editor THE AUTOMOBILE:

[1,676.]—As I have been a constant reader of "The Automobile" for the past two years, I have noticed in your "Letters Interesting and Instructive" many useful and suggestive ideas, some of which have helped me out of many a difficulty, and many of which I have put to practical tests.

And, now, I take the liberty of asking a question myself. Why do some manufacturers and users of automobiles claim that the main shaft of an engine (the flywheel shaft) should not be hung on ball bearings, but should be on plain bearings? If the ball bearing idea is wrong, why do not more of them supported in this way give trouble?

Also, why can a two-cylinder motor double opposed be slowed down more than a four-cylinder under the hood with the same conditions governing? I mean by this, suppose you come to a street crossing where there is a rise and you brake your car without throttling it down.

I speak of no one car over another in this letter. It is simply a question which has arisen among men using and buying autos.

Peabody, Kan. C. E. DAVISON.

It is out of the question to reason for the various designers of automobiles. Since both kinds of bearings work, it is a mere matter of selection, just as is the color of the finish; some like "red" and a preference for "maroon" is not unknown. Buyers can find both kinds, and are not, therefore, compelled to go against their inclinations.

Why a double opposed motor can be slowed down more than a motor with four cylinders, is a matter depending upon a number of circumstances, in some cases of which what you say is true. If you mean that some motors will run slower than others, then the reply is that the flywheel in such cases favorably influences the situation. If the flywheel effect is great in proportion to the conditions that demand such effect, the motor can be run slow. With a light flywheel the reverse would be true.

TRANSCONTINENTALISTS AFTER INFORMATION.

Editor THE AUTOMOBILE:

[1,677.]—As a friend and myself are planning a transcontinental automobile trip for some time in the Summer, we would like to have your valuable assistance in the matter of picking a route. New York is the starting point and San Francisco the ultimate destination. Except for passing through Dayton, O., and Kansas City, our itinerary is immaterial. After studying various volumes of the Automobile Blue Book we have selected two possible routes for the eastern part of our journey, but we are undecided as to which one is preferable. The first is: New York, Syracuse, Buffalo, Cleveland, Columbus, Dayton, Indianapolis, St. Louis, Kansas City, Denver, Salt Lake City, to San Francisco. The other one, which is a trifle shorter, takes in New York, Philadelphia, Altoona, Pittsburg, Columbus, Dayton, and so on. Now, which of these would you recommend? It is not our intention to break any records, as we have plenty of time and want to enjoy the tour.

We are also somewhat in doubt as to which would be the better way across the Rocky Mountains from Denver—via the southern route or the northern. Any information you can give me through your columns will be greatly appreciated. DICK WILES.

New Haven, Conn.

The first route mentioned should serve your purpose very well, indeed. See Section No. 4, of "The Automobile Official Blue Book," for maps of the several routes already followed by transcontinentalists.

WIND SHIELD ON PRINCIPLE OF THE DODGER.

Editor THE AUTOMOBILE:

[1,678.]—Will you kindly tell me through your "Letters Interesting and Instructive," if there are any manufacturers who make automobile wind-shields on the principle of the "dodger" on a steamer's bridge, the material of canvas, celluloid or other light material? A glass shield is very heavy and more or less dangerous should an accident occur and it seems to me that a dodger could be made which coming to the operator's shoulders or even lower would carry the wind over the heads of the occupants of the car.

Saint John, N. B. KOYDEN THOMSON.

You probably can get just what you want from several makers of wind-shields.

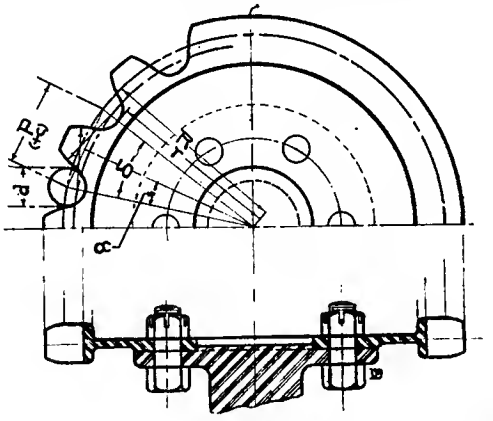
THE PRIME CAUSE OF NOISE IN CHAINS.

Editor THE AUTOMOBILE:

[1,679.]—I am a constant reader of your paper and have been wondering if, through "Letters Interesting and Instructive," you could not give me some light on a subject which has perplexed me for a long time. I have owned a number of cars, all of them chain driven, and aside from the other qualities of the cars, the efficiency of the respective chains as to wear, etc., but especially as to noise, has differed a great deal. This question of the noise has bothered me, and so far I have been unable to determine exactly why some chains are noisier than others. Can you throw any light on the subject? "NOISE."

New York.

Yours is a question of sprocket design, not the chain, which causes the trouble. It is a comparatively easy matter to get good chains, but even when they are used, the noise is still there in many cases. The critical point in sprocket design is the radius (r), of the base line circle as determined by the chain, and the gear ratio to be employed. When these have been selected, we have the pitch, or the distance between centers of the rollers, and the diameter of the rollers. By the use of the accompanying drawing it is easily seen how important it is that the



Sprocket Layout, Showing the Mode of Procedure in Designing.

value for "r" be accurately calculated so that when we have spaced the circumference for the correct number of teeth each roller will seat properly on the sprocket. Any error in the value of "r" is multiplied by 6.2832 in the circumference, so it is easy to see why some chains will not seat evenly without binding if mistakes are made in finding "r."

The following example may help to make this question clearer. Example:

Number of teeth = N = 14.

Distance between centers of rollers = pitch = P = 1.25 inches.

Diameter of rollers = d = ⅝ of an inch.

$\alpha = 180° \div N = 180° \div 14 = 12° 51' 25''$.

$$R = \text{radius of pitch circumference} = \frac{1}{2} \times \frac{P}{\sin \alpha}$$

$$= \frac{1}{2} \times \frac{1.25}{.22252} = 2.8087 \text{ inches.}$$

$r = R - \frac{1}{2}d = 2.08087 - .3125 = 2.4962$ inches. (This is the important dimension in designing sprockets.)

C = clearance.

There is one other matter that does not always receive its due measure of attention, i.e., the number of teeth should not be reduced below a certain minimum. It is not uncommon to see sprockets with 9 teeth, in designs in which the gear ratio cannot be arrived at in any other way. In such cases the

small number of teeth come as a necessary evil, yet even so sprockets with 14 teeth would be less noisy. One more point: increasing the diameter of the sprocket is equal to increasing the life as well. This is because the pressure on the teeth will be lessened, since,

$$P = \frac{H.P. \times 33{,}000}{2\pi R S}$$

In which,

P = pull in pounds;

R = pitch line radius in feet;

S = speed in revolutions per minute;

H.P. = horsepower to be transmitted.

In conclusion, then, it is to say, noise is the product of either badly designed sprockets or lack of attention in the maintenance of the chains. Certainly a chain is entitled to a little care; it has joints to hold grit, and, in time, lack of oiling and attention will do the trick.

CARE OF CARS FOR WINTER.

Editor THE AUTOMOBILE:

[1,680.]—It would, I think, prove very useful to many of your readers to have you give in detail suggestions as to the putting away of cars for the Winter. Too many owners of machines store their cars, observing necessary rules about draining the water off, blocking the wheels, etc., but do not know sufficiently well how to do it, or why it is done, and after a severa Winter are more than apt to find that their cars have suffered for want of adequate knowledge on their part in tha refinements of the art they have undertaken. I have known of cases where cylinders have cracked, despite the fact that the petcock in the radiator had been opened and the water supposedly had been drained off. Certainly the opinion of an expert upon the care of a car in winter storage, giving details as to how the engine, gears, brasses, etc., should ba left, would be both timely and widely welcomed. H. G.

Roslyn, N. Y.

Something of the sort will be taken up, in an early issue.

AMERICAN SITUATION IN RE BALL BEARINGS.

Editor THE AUTOMOBILE:

[1,681.]—Tbe use of ball bearings on crankehafts of gasoline motors is not a question of engineering possibility; that is settled by the fact that thousands of motore are successfully and satisfactorily equipped with and running on ball bearings. Such use ranges from motor cycles to torpedo boat motors. In tbe former case the load is one of a relatively few pounds. In the latter case the load per bearing runs up to 14 tons. The illustration is of a Frencb marine motor loaded with 10 tons per journal in regular service; the acceptance trial involved 14 hours run at 450 r. p. m. under a load per jonrnal of 14 tons.

But it is not engineering feasibility alone that is the determining feature. There is also the question of cost. That is beat considered in the light of the fact that the ball bearing crankshaft is the regular practice for a considerable number of years of many builders of automobiles.

With the feasibility from an engineering and from a cost standpoint thus proven by the best of all tests, practice, there is the question of durability. This again is definitely proven by the continued use, year after year, of the ball bearing crankshaft by the buildere of four and of eix-cylinder motors of from 15 to 50-horsepower as well as of the smaller motor cycla engines.

Remains the question of noisa! Every builder of anti-friction bearings knows and every candid and reputable one will tell his clientèle that the only absolutaly quiet bearing is a plain sliding journal well oiled. That doee not mean that the ball bearing is necessarily noisy; quite the contrary. We hava such bearings in use on organblowers where even the slight bum of the electric motor must be masked. What it does mean is that sounding box constructions and all sound magnifying constructions must be avoided. There is even a very decided indirect benefit sincc the most efficient mountings and mechanisms happen to be those that are without such sound magnifying or resonant affects. The cutting out of ball bearing noise has thus frequently resulted in the cutting out of noise producing elements generally. Some builders find ball bearings noisy in their motors, others do not so find them. The difference lies in the motors and usually in soma rather small and apparently unimportant structural details. The writer agrees to find the cause and remedy the matter for any motor whosa builder is sufficiently interested to send it to him for that purpose and to do that work free of all charges.

The ball bearing is in itself a new element of mechanism; possibly this should be modified into "relatively" new; relativa as compared with the antiquity of the plain journal, but absolutely new where knowledge of correct construction, material, workmanship and application is concerned. It is eo trite an experience as almost to require no etatement even that before any new thing is generally adopted there will be much trial, abandonment, retrial, finally, general adoption. The ball bearing is no exception.

In its various forms it is daily going into use by the many thousands—one form alone, that known as the Hees-Bright or DWF is supplied from one plant daily, thousands ranging from ¼ to 40-inch, and using balls from 1-16 inch to 4 inches diameter and costing from a few cents to several tbousand dollars per piece. It may therefore be conceded, notwithstanding its relative youtb, that the ball bearings has, as our French cousins would say, "arrived."

The crankshaft uee of the ball bearing is in an earlier stage, that of trial, success by many, failure by a few, retrial, and in many casee final adoption. The instances of definite failure are almost none. The cases of dissatisfaction because of failure to recognize, or unwillingness to properly adopt otber conditione to the requirements of the ball bearing are more numerous. In this connection a very general trait of humanity is interestingly brought out, since such trouble ie experienced by the better automobile builders, whose self-reliance prompts them to ignore the advice, aid, and experience of the ball bearing specialist. On the whole, tbough there are defections among the users of ball bearings for crankshafts, there are more accessions.

This communication is prompted by the receipt of a letter from The Pope Motor Car Company, from which I quote:

"On page 759 of 'The Automobile' of November 20, 1908, appears an interview in which it is said: 'The other ie the abandonment of ball bearinge for crankshafts in favor of plain bearings in notable instances.' Now, our (Pope) experience with ball bearings in tbe crankshaft has been that, by the use of these ball bearings, all bearing trouble in the crank has been eliminated. When we adopted this style of bearing it was with us more or less of an experiment and was watched with a great deal of interest, but we have yet to replace our firet ball bearing in a crankshaft. This is probably due to the peculiar construction which we employ and which construction ie patented, and that is, casting steel plates integral witb the engine base, so that when the steal yoke and engine base are machined to carry the bearings, the ball bearing is carried on a steel cradle or yoke which extends around its wbole diameter.

"If any of the foreign makers have had trouble with ball bearings in the crankcase, it must have been due to inferior bearings or inferior mountings, and we believe that in justice to the ball-bearing crankshaft and yourselves, you should take some extended notice of criticism and refute statements of facts as they exist in this country."

It was not my original intention to eay anything on this question of ball bearings for crankshafts. I know that the ball is rolling, and that though thare will be occasional halt and elowing down the essential desirability of the ball baaring crankshaft, coupled with the already fairly considerable and in every way satisfactory and successful use will give it an increasing momentum. The logic of events and not anything that I can do or eay will govern. But it did seem to me that the request of a pioneering user such as The Popa Manufacturing Company could not be ignored. The virtual command of a second letter: "We tbink that you ought to do for your own sake and for the sake of hundreds of other users of cars and also manufacturers who are using your bearings, is to come out with a strong statement," could not be ignored.

Philadelphia. HENRY HESS.

APPRECIATION FROM A EUROPEAN SOURCE.

Editor THE AUTOMOBILE:

[1,682.]—From a far away corner of Provence. let me assure you how much THE AUTOMOBILE is appreciated for news of the American automobile world. I infer that tbousands feel the same way, for through three different sources I have tried to obtain from your office an extra copy of the issue of August 10. My last effort was to apply to you direct, when I received the following response: "No copies of the issue are on hand, and none have been returned by the news companies." If your publication sheet is always cleaned up as well as this, no wonder you are able to produce so excellent a paper. Long may it live and continue to gatber readers as it goes!

As for its abounding interest for all interested in automobilism, I may say that I turn my copies each week over to tbe local garage proprietor, a Frenchman, who cannot read a word of English. He says ha can keep better informed of the trend of new idea in accessories, tires, and tbe like, by merely looking at the pictures in THE AUTOMOBILE than by the belated news which drifts to him through the French papers. "Vive l' Automobile; very good," he says every week, as I hand him over my copy.

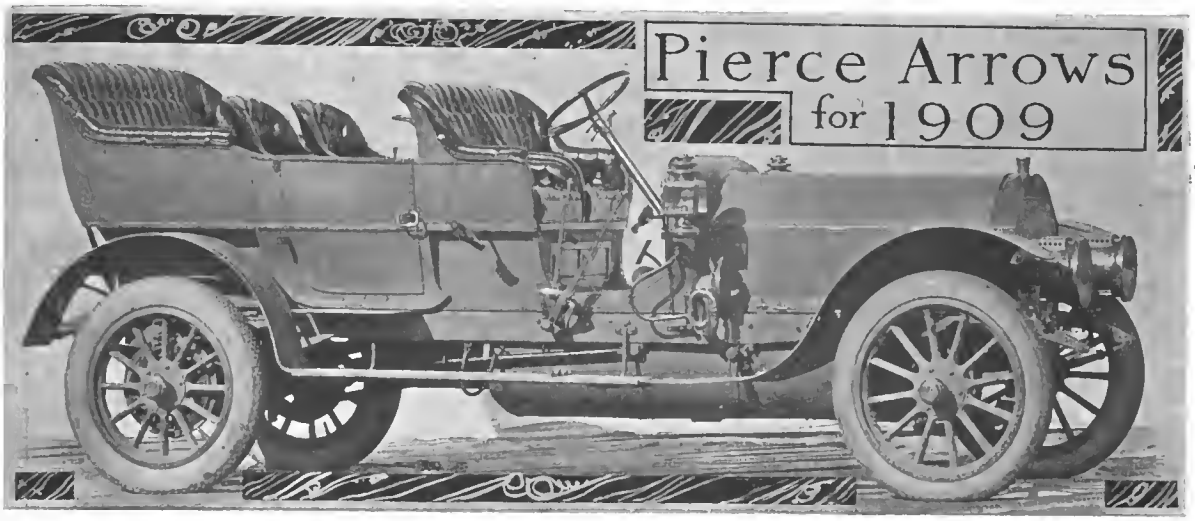
Cassis, B. du R., France. B. McMANUS.

A VERMONT CITY WANTS AUTO FOR POLICE.

Editor THE AUTOMOBILE:

[1,683.]—The Police Commissioners have been asked by the Board of Aldermen to investigate different gasoline police patrol automobiles. Will you advise us who makes such, or advise your advertisers through your columns?

Burlington, Vt. HAGAR BROTHERS.



Lines of the Pierce Great Arrow 6-60 Seven-Seated Touring Car for 1909.

By CHARLES B. HAYWARD.

BUFFALO, Dec. 14.—With no less than five different chassis of varying powers and numerous distinctive types of bodies, the Pierce offering for the coming season sets a high-water mark where the range of models ever offered by a single manufacturer is concerned, as there are 35 styles of Pierce cars now listed. To begin at the top, which is appropriate in the present instance, as the Pierce name has been more closely associated with the production of high-powered cars, such as the 40 and 60-horsepower Great Arrow models, there will be no less than three distinctive six-cylinder models, rated at 60, 48, and 36-horsepower, according to the A. L. A. M. formula. With the exception of a few minor improvements, the 60-horsepower machine is the Pierce Great Arrow of the present year's design that has done so much to uphold the builder's name in contests and in the hands of a large number of users, while the 48 and 36-horsepower types are entirely new models, the specifications of which were adopted by Designer Fergusson this Summer, not long before going abroad. Besides these three six-cylinder models, there are also listed under the Pierce name two fours, one of which is the four-cylinder 40-horsepower car that has long been familiar, and a new town car model rated at 24-horsepower, which is an entirely new creation, besides being the smallest Pierce turned out by the Buffalo factory in the past two or three years. Up to a short time ago efforts at the Pierce plant were centered upon the production of these two types and a large number has already been delivered; according to Colonel Clifton, probably the last four-cylinder car to be put out under the Pierce name will have left the works by the first of the year, as the company may devote its energies henceforth exclusively to the six-cylinder type.

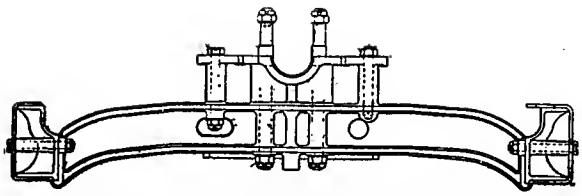
Series of all three models of the latter have been coming through in numbers together with the fours now being built, but despite the capacity of the big plant, deliveries have fallen considerably in arrears and a night shift of two or three hundred men has been continuously employed on machine work with the prospect that this will be necessary for some time to come in order to catch up; as the Pierce output of 1909 cars will doubtless be the largest in the history of the company's activities to date, owing to the unusual number of models listed.

Some of the Motor Details.—That painstaking attention to detail of design and construction that makes for the maximum degree of reliability and extended service finds its highest exemplification in the Pierce, and it is accordingly characterized by numerous features of interest that would ordinarily escape any but an experienced eye. In the design of the 36 and 48-horsepower six-cylinder types, a departure has been made from previous standards by the adoption of twin-cylinder castings, though the T-head, or outboard valve port type has been retained. The cylinder dimensions of these two motors are 3 15/16 by 4¾ inches, in the case of the smaller, and 4½ by 4¾ inches, bore and stroke, respectively, on the 48-horsepower model, the 60-horsepower six-cylinder car having 5 by 5½-inch cylinders. The valve operating mechanism has been improved by the substitution of an adjustable roller end at the cam in place of the solid plunger formerly used, while the use of a fiber block contact for the tappet tends to eliminate all noise from the operation of this part of the motor.

Mr. Fergusson is a strong believer in the use of aluminum where weight-saving or appearance are paramount, but will have none of it in positions of responsibility, so that while this material finds liberal employment in crankcase, gear-set housings, and body construction, the usual cast aluminum arms for the motor support are missing, two drop forgings of high-grade steel, attached to the crankcase by four through bolts, taking their place. These not only form a far more dependable, but also a much more elastic foundation for the motor. The forward frame brace is channeled to form a cradle for the radiator, its attachment relieving it of all torsional strains and making it very easily removable.

Lubrication is taken care of by the well-worked-out circulating system that has always distinguished the Pierce motors in this respect, and which makes for extreme simplicity and reliability on this all-important essential. A small gear pump attached directly to the side of the crankcase

Rear Springs and Brakes, Pierce 4-24 and 6-36 Models.



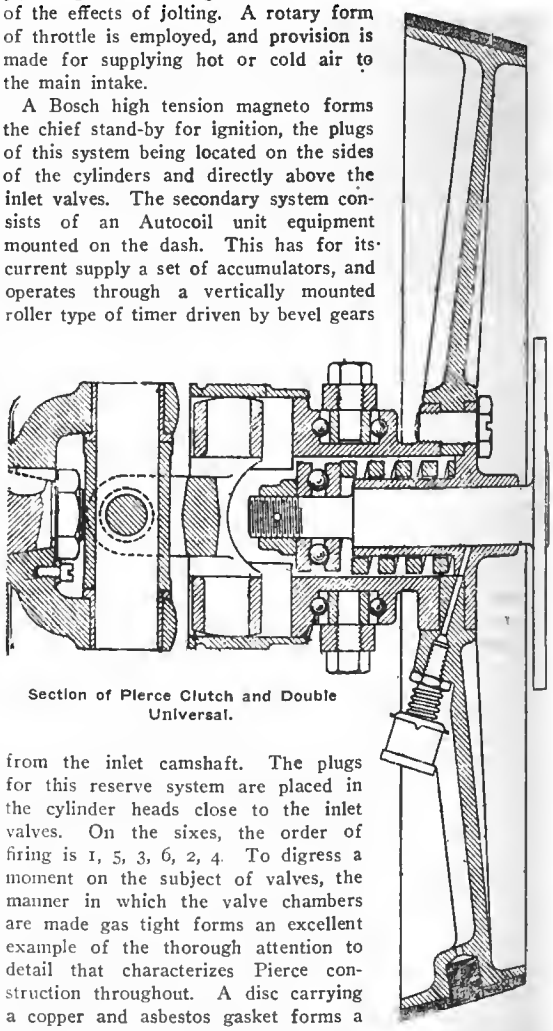
Drop-forged Motor Support and Crankcase Attachment.

and driven through a spiral gear on one of the camshafts, elevates oil from a well forming part of the crankcase oil pan, to a copper tank at the level of the cylinder heads. It is discharged into this tank through a double system of wire gauze filters, thus cleaning the oil every time it is circulated. From the tank it flows by gravity through 1/16-inch outlets to copper tubing of large bore to the seven main bearings of the six-cylinder motor, from which it is distributed by means of centrifugal force through the drilled crankshaft. A sight gauge conveniently located indicates the height of the supply in the reservoir. As the bearings are continually flooded with oil by this system, baffle plates are employed to prevent an excess being splashed on the piston. No oil rings have been found necessary and a liberal supply of lubricant is insured the wrist pin and small end bearing of the connecting rod by turning a wide shallow groove in the piston at the pin openings and by providing three recesses in the upper face of the bearing to retain some of the splash. The oil outlets of the tank are recessed to take washers with variable sized openings, so that the feed may be regulated in this manner. The other auxiliaries, such as the centrifugal circulating pump and the magneto, are driven from separate shafts on each side of the motor, the driving pinions being self-contained in the aluminum housing of the timing gears, thus greatly facilitating the assembly and dismounting of this part of the motor. Phosphor bronze bearings are used throughout, their alignment in the case of the crankshaft being perfected by reaming in place.

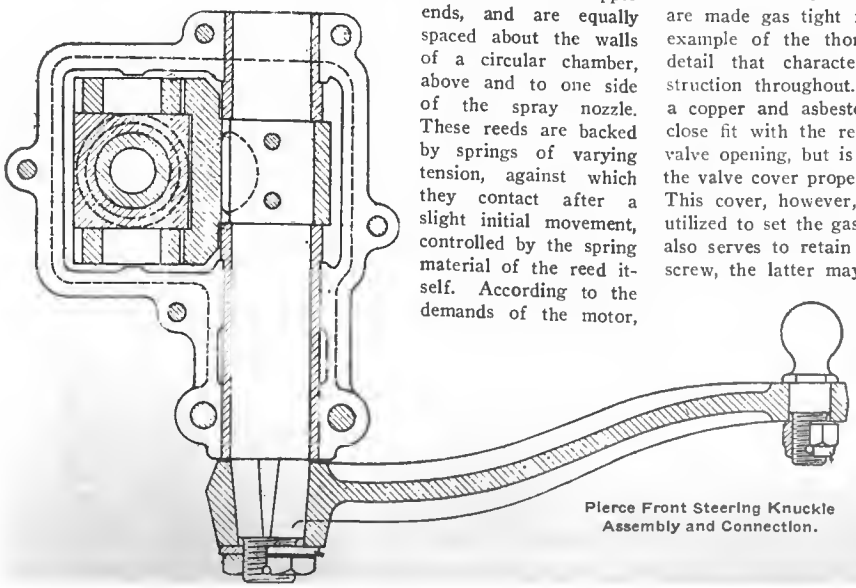
New Air Valve a Departure.

Particular interest attaches to the new type of auxiliary air valve on the carbureter, as the adoption of spring controlled reeds in place of the usual piston or diaphragm type, marks somewhat of a departure from current practice in this respect. On the carbureter for the smaller motor, there are two of these reeds, and on the larger, three. They are placed vertically, fastened at their upper ends, and are equally spaced about the walls of a circular chamber, above and to one side of the spray nozzle. These reeds are backed by springs of varying tension, against which they contact after a slight initial movement, controlled by the spring material of the reed itself. According to the demands of the motor, these reeds uncover their respective openings in the order of their increasing spring tension and insure an exceedingly gradual and uniform addition to the air supply, thus preventing any disturbance of the mixture proportions, regardless of the suddenness of the throttle opening. The mixing chamber, placed directly over the concentric float chamber, is waterjacketed. The float valve is spring-controlled, thus maintaining a uniform supply of gasoline through the elimination of the effects of jolting. A rotary form of throttle is employed, and provision is made for supplying hot or cold air to the main intake.

A Bosch high tension magneto forms the chief stand-by for ignition, the plugs of this system being located on the sides of the cylinders and directly above the inlet valves. The secondary system consists of an Autocoil unit equipment mounted on the dash. This has for its current supply a set of accumulators, and operates through a vertically mounted roller type of timer driven by bevel gears from the inlet camshaft. The plugs for this reserve system are placed in the cylinder heads close to the inlet valves. On the sixes, the order of firing is 1, 5, 3, 6, 2, 4. To digress a moment on the subject of valves, the manner in which the valve chambers are made gas tight forms an excellent example of the thorough attention to detail that characterizes Pierce construction throughout. A disc carrying a copper and asbestos gasket forms a close fit with the recessed seat of the valve opening, but is simply dropped into position. Above this the valve cover proper is loosely threaded into the port opening. This cover, however, carries a substantial set screw, which is utilized to set the gasket home, while the tension thus produced also serves to retain the threaded cover. On releasing the set screw, the latter may be turned out by hand.



Section of Pierce Clutch and Double Universal.

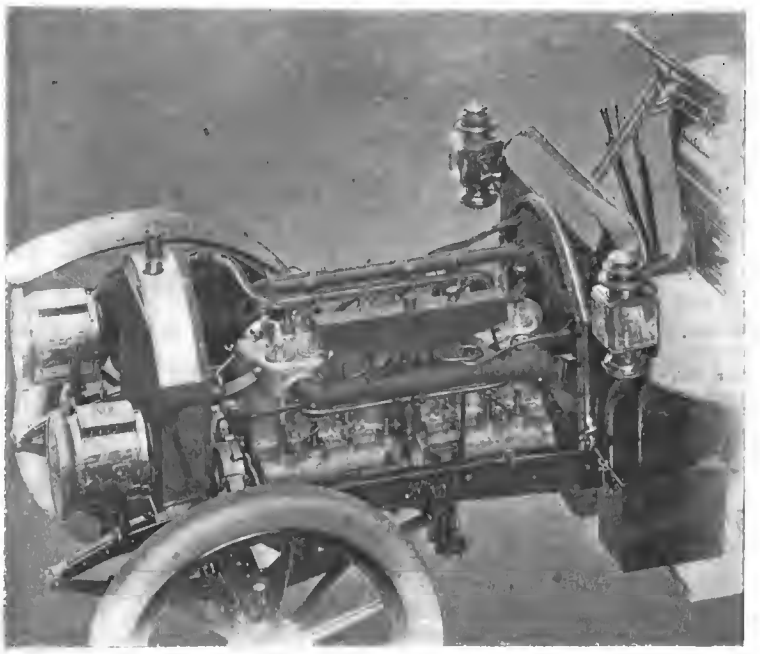


Pierce Front Steering Knuckle Assembly and Connection.

A feature of special interest is to be found in the new type of exhaust manifold recently adopted. It is a matter of common knowledge that no great amount of science has ever been lavished on this essential, though the room for improvement has been manifest. Experiment has shown that setting up an injector action in the flow of the gases from the different valve ports as they successively discharge into the manifold produced

a partial vacuum and was responsible for a greatly improved scavenging of the cylinders. The new Pierce manifold has accordingly been designed with this end in view, and experiments at the factory show an increase of fully 5 per cent. in the power of the 48-horsepower motor over its performance when run with an entirely free exhaust. Instead of being in a single piece, the new manifold is made with a gas-tight slip joint between each pair of cylinders to prevent disalignment of the cylinder castings, owing to the excessive expansion of the usual one-piece manifold, numerous tests proving this to be fully ⅛-inch under extreme conditions, as measured in the distortion of the twin cylinder castings from their true position.

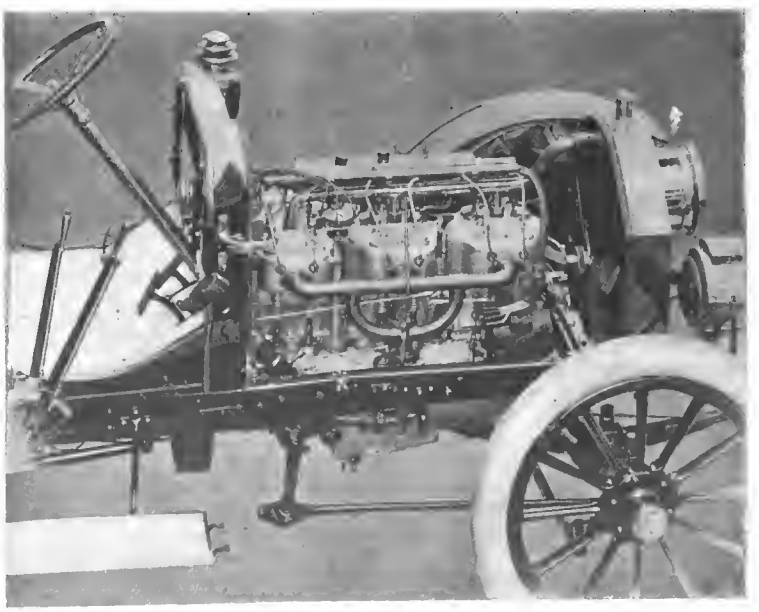
How the Power Is Handled.—Despite a more or less general tendency looking to the abandonment of the cone type of clutch in the past few years, this has been consistently adhered to in Pierce construction, and with the aid of a single row of cork inserts in the leather facing, and a carefully designed method of mounting, it has always proved exceptionally efficient and reliable, while having the further advantage of simplicity to recommend it. The spring is of the self-contained type, thus avoiding all thrust when the clutch is engaged, special ball thrust bearings being provided to take this when released. An unusually short full universal connects the clutch shaft and gear-set.



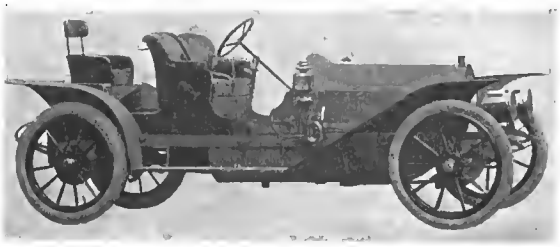
Oiler and Pump Side of the New Pierce Arrow 6-36 Model for 1909.

Announcement has already been made to the effect that henceforth the Pierce transmission system would no longer be distinguished by the retention of the progressive gear-set, and that a four-speed gear box operating on the selective plan with side lever actuation would be substituted, but a review of the specifications of this essential as now designed shows it to be the development of a long and careful study of the problem by Designer Fergusson. Krupp chrome nickel steel is employed for both shafts and gears, the moving members sliding on four heavy splines on the main shaft, while their corresponding pinions are bolted to flanges integral with the countershaft, thus avoiding distortion in heat-treating where integral. Both shafts are carried on Hess-Bright annular ball bearings, and the factor of safety recommended by the maker has been greatly exceeded by adopting much larger sizes than those ordinarily supplied for the same service. The usual H-gate is employed in connection with the side lever, but there are one or two features of operation that illustrate the thoroughness with which the design has been worked out. Current practice is followed in the spring-controlled ball dropping into recesses in the bars inside the housing, to determine the exact position of gear engagement, while an interlocking device consisting of a quadrant drilled with a series of holes into which a pin drops at the various engaged positions, prevents shifting without disengaging the clutch, and also serves to lock the gear-set in the neutral position. This is a feature of considerable merit, as it effectively prevents tampering with the gear-shifting lever when the car is standing unattended. It is necessary to disengage the clutch before the lever can be moved. The gear-set provides four forward speeds with the direct drive on the fourth, and the design has been developed with a view to meeting the necessities of the different models listed, thus avoiding confusion in manufacture by making it possible to equip all with the same gearbox. The prompt handling of such a number of models has been facilitated by standardizing parts wherever this has been found possible.

Final drive is by propeller shaft, a universal being employed at each end, the rear joint also being designed to telescope longitudinally. The rear axle driving unit is carried on Hess-Bright annular ball bearings, as are also the wheels, and while a live axle is employed, it is not of the floating type, the wheels being fastened directly to the ends of the axle with Woodruff keys instead of running on the tube, as in the usual construction. The driving shafts are of Krupp chrome nickel steel, having an elastic



Illustrating the Carbureter and Magneto Side of the Same Motor.

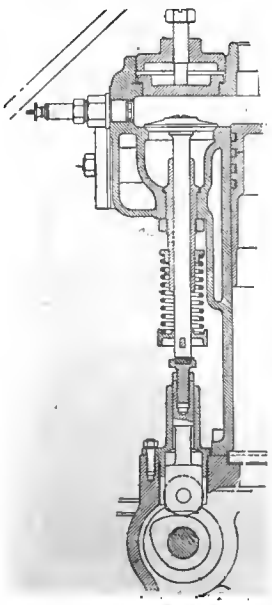


Lines of the Pierce Arrow 6-36 Three-Seater.

limit of 120,000 pounds, and are of tapered form, the increase in diameter toward the wheel end amounting to fully 25 per cent. over the inboard section. Large ball bearings are used, the inner one being mounted very close to the center line of the wheel, so that the bending moment is extremely small. This gives a somewhat lighter construction and the success of the design is manifest from the fact that in all the Pierce cars turned out none of the driving shafts have suffered from either torsion or shearing stresses. The rear hubs are drop forgings with cold drawn housings, while the front hubs are stamped complete.

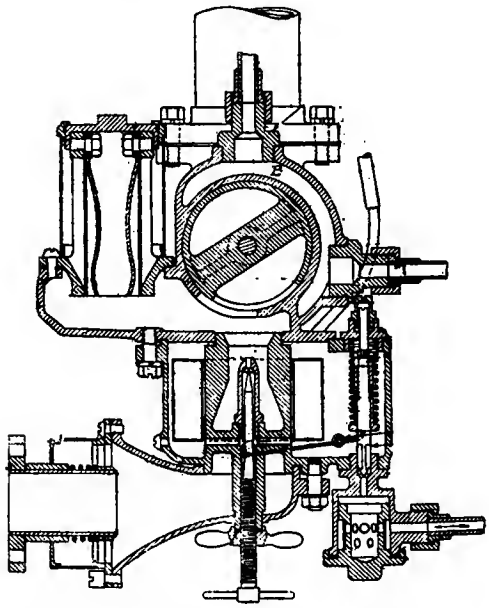
Instead of attaching the triangular torsion rod of seamless steel tubing rigidly to the differential housing as previously, the points of the base of the triangle are mounted on a large pin which permits of the rod as a whole being free to swivel on it. The usual spring mounting is retained at the forward end. Another departure is to be found in the rear axle strut rod, the construction of which eliminates the use of a turnbuckle. The two halves of the rod are right and lefthand threaded and screwed into the brake hanger and differential housing respectively, lock nuts being provided at the latter point. This is almost opposite one of the holding bolts of the substantial case.

On the six-cylinder 36-horsepower model and the four-cylinder town car, three-quarter elliptic springs are used on the rear, with the usual flat, semi-elliptics front, these being used all round on the other models. Instead of bolting the leaves together, this practice causing tbe spring to break where drilled, two bosses are stamped up out of the center of the leaf before heardening, each pair dropping into recesses formed by the punchings in the leaf below, thus effectively preventing any end motion, without tbe use of a rigid fastening. In the case of both the front and rear springs a revolvable mounting on the axle is employed, with a large groove turned in the seat for oil. These saddles are drop forgings and carry an extension bracket that forms the lower attachment of the Truffault-Hartford shock absorbers, which are part of the regular equipment of all Pierce cars.



Pierce Valve Assembly.

The front axle is a one-piece drop forging of simplified design, the yoke being made integral with the spindle instead of with the axle, a generous sized nickel-steel pin holding the two together and being locked in place on the axle by means of a set rcsew. An unusually large braking area is provided, Raybestos lining now being used in place of the bronze to steel contact formerly employed. The internal expanding or running brake is cam-operated and the emergency by direct pull, both acting on opposite faces of the same drum, and both being equalized. The emergency is not interconnected with the clutch, thus permitting the motor to be used as a brake, and its operation has been changed by making the lever pull up. A substantial sprag that may be instantly brought into action by the driver forms a standard part of the equipment of all the larger cars. The steering gear is of the screw and nut type, actuating a forked lever supported on a trunnion, making a practically irreversible gear, so that no road vibration is transmitted to the steering wheel. The Pierce standard tire equipment consists of



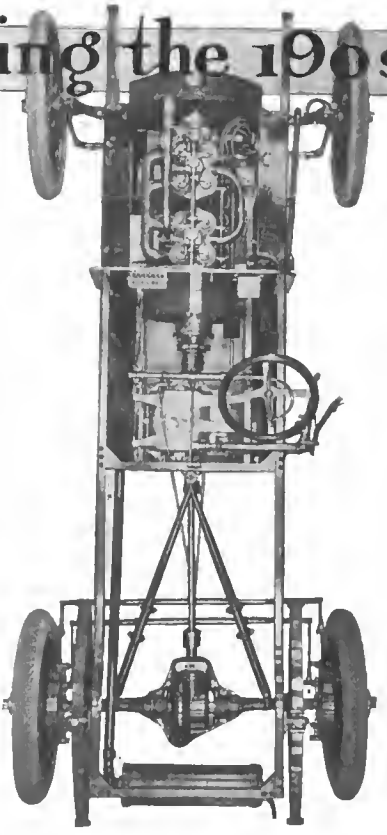
Sectional View of the Pierce Carbureter.

Goodrich quick detachables, 36 by 4 1-2 and 5 1-2-inch tires being used on the six-cylinder 60-horsepower car; 36 by 4 and 5-inch on the 48; these also being the sizes of the 40-horsepower four-cylinder model, and 34 by 4 and 4 1-2-inch on the six-cylinder 36. The wheelbase range from 112 to 135 inches.

With the exception of the features of the new Pierce cars that have been described in detail, their design and construction will be continued unaltered, and a review of the specifications of the different cars suffices to show that as a whole there has been little change, and what has been considered expedient has taken the form of improvement of the details. With the exception of the abandonment of the progressive type of change speed gearing with the operateing lever directly under the steering wheel, which has been a distinctive feature of Pierce design ever since the first car of this name has been on the market, there are few points by which the 1909 Pierces could be distinguished on the road from their predecessors of the preceding year's model. Probably the most noticeable of these is the adoption of the three-quarter elliptic type of spring for the rear suspension of the two smaller models, the 4-24 and the 6-36, it not being deemed advisable to carry out this idea on the bigher-powered cars owing to the danger of setting up a dangerous lateral movement of the body at high speeds, particularly when traveling over rough roads, which would be apt to bring this about even at ordinary speeds.

Starting with the five chassis as the foundations of the various models, it will be apparent thta on the average no less than seven body styles will be available to the purchaser in each power, but as matter of fact this is not tbe case, the range where the smaller cars are concerned not being so extensive. This is partly due to the fact that only the high-powered models will be made in the seven-passenger touring types, in addition to the usual enclosed models, such as the limousine and landaulet. Some special roadster types will be turned out, such as the Pierce 6-36, three-seater, shown by one of the photos, the design being a special creation for the 36-horsepower chassis.

Describing the 1909 Moons



THE two Moon models announced for the coming season will carry out the Moon ideas advanced and proven in previous years, among which are the four-cylinder motor with overhead valves, four-speed selective transmission, multiple disc clutch, etc. Among the newer ideas which will be featured are single ignition, using a high-tension magneto with special starting device, dropped frame, the drop amounting to 3 1-2 inches, which gives a very small angle to the driving shaft. Then, too, the water jacket space is unusually liberal, the gasoline tank is removed from the dangerous position at the rear of the chassis to the more accessible one under the front seat. A cambered rear axle of the full floating type is another feature that should find favor.

The 1909 Moon is distinctly neat in appearance, and differs mechanically from the commonplace in motor, ignition and rear-axle construction. The valves are in the head of the motor and are operated by a single camshaft for intake and exhaust. Ignition is by high-tension magneto without the use of batteries or vibrators, and to facilitate starting a simple but effective spring-actuated device is used to spin the magneto armature. The rear axle is particularly distinctive, being of the arched type, permitting the rear wheels to be cambered Two models are built for the present season, differing only in wheelbase and corresponding constructive strength. Model C has 112-inch wheelbase; Model D is the seven-seated car with a wheelbase of 121 inches. Interchangeable bodies of different typs are provided.

A Preference for Full Elliptic Springs.—The frame is of 3-16-inch cold pressed steel of 4-inch and 4 1-2-inch channel cross section. The rear of the frame has an upsweep of 3 1-2 inches, which permits the use of full elliptic springs in the rear and gives a low center of gravity without interfering with the road clearance. This has been a Moon feature for three years, and during this entire time there has never been a broken rear spring reported. A subframe carries the motor and transmission and insures perfect alignment under all conditions.

The front axle is of I-beam section drop forged steel and is located 5-8 inch in advance of the front of the radiator, which adds to the appearance of the car, as well as to the riding qualities, owing to the weight of the car being hung between the axles.

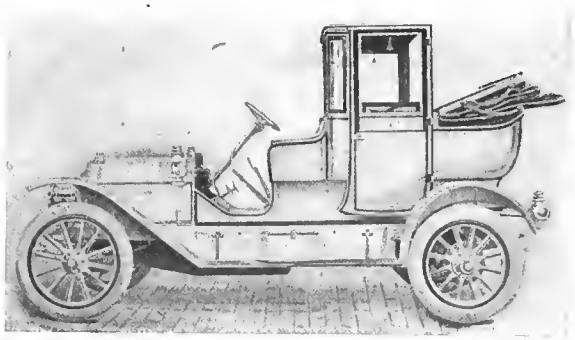
The rear axle is of the full floating type, special Moon design. It consists of heat-treated steel live axles, driving the hubs through four-fingered clutch plates. The weight is carried upon seamless steel tubing surrounding the live axles, which are in turn moulded to the steel differential housing. A 3-4-inch turnbuckle truss below axle preserves outward set. Between the differential and live axle are two small universal joints, which permit the rear wheels to be cambered at an angle of two degrees, giving an arched type of construction that is not only very strong but also is a great advantage for fast driving in that it holds the car to the road. Ball bearings are used, both in the front and rear axle.

The wheelbase of Model C has been lengthened two inches on the new model; the tread is 56 inches. On Model C, both touring and limousine cars, 34 x 3 1-2-inch tires are used in front and 34 x 4 1-2-inch on the rear. On the roadster and all Model D types, 36 x 3 1-2-inch tires are used in front and 36 x 4 1-2-inch on the rear. Four brakes of the equalizing type, acting on the rear wheel drums, are provided. The hand lever is for the internal expanding brake, and the foot, or service brake, the outside band. Raybestos is used as lining on all brakes.

Valves in the Head Type of Motor.—A four-cylinder, 4 1-2 x 4 1-2 motor has been a Moon feature for three years, and is only modified this season by minor refinements. The cylinders cast in pairs have the valves located in the head; all valves are interchangeable. A single camshaft driven by a vertical shaft has but four cams to operate the eight valves. At 1,600 revolutions the motor develops 32.2 horsepower and is capable of very low speeds under heavy loads. The half-time gears are enclosed in an aluminum housing. A copper intake pipe leads from the carbureter, which is of the single-jet auxiliary air valve type. The carbureter is water jacketed and is placed on the opposite side from the exhaust. The cylinders are bolted to an aluminum crankcase provided with four arms, which are in turn carried on the subframe. A large water pump of the centrifugal type is gear-driven from the vertical shaft. It is placed in a horizontal position in such a manner as to be readily removable. The crankshaft is made from a single piece of alloy steel, carefully heat-treated, accurately turned and ground. It is mounted on three white bronze bearings of large size. Eccentric oilers are provided in conjunction with the crankshaft system of lubrication. The connecting rods are one-piece drop-forged steel, with phosphor white bronze bushings. They are fitted into 6 1-2-inch pistons, provided with three piston rings, centered to prevent any tendency to rotate.

Lubrication is provided by a force-feed oiler directly connected to the end of the crankshaft and mounted on the dash. Visible sight feeds are provided. The oiler is of the eight-feed type; three lead to the main motor bearings, four to the cylinders themselves and one to the lower bearing of the vertical shaft. As an auxiliary, the splash system can also be used.

Ignition Follows European Practice.—European practice is followed in the ignition system. The Bosch high-tension magneto only being used, eliminates batteries, vibrating coil, distributor and an abundance of primary and secondary wiring. Four high-tension cables lead from the magneto to the plugs, and the connections are made with a neat system of knife switches. To more than counteract any disadvantages that may be attributed to this single system of ignition, a simple but effective starting device is employed. With this it is possible to start the motor from the seat without the use of any other outside agency than the magneto itself. A very simple device is used in disengaging the magneto from its driving gear and throwing the armature of the magneto to form a contact. After the first cylinder has been fired an impetus is given to the crankshaft, and the magneto automatically drops back into gear. This is an original design and is covered by patents. A genuine honeycomb radiator is used in the cooling system. Large water chambers are provided around cylinders and valves, and water spaces as well between



Model C, Brevette Landaulet Moon for 1909.

each pair of cylinders. Large containers are provided in the cylinder heads, and these jackets extend in between the valve chambers. Tbis method of cooling the valves insures perfect cooling of the motor at any speed. The only fan used is that which is cast in the flywheel. A circulating pump is located below the radiator, making the low part of the pump the lowest point in the entire cooling system. It is provided with a petcock and furnishes a simple means of draining all the water from the cylinders and the radiator.

The gasoline supply is carried in an 18-gallon copper tank located under the front seat. The gasoline flow is by gravity to the carbureter. The tank is so located that the flow is constant on the steepest grade.

Fifty-one Discs in Clutch.—A multiple-disc clutch is used consisting of 51 high carbon steel discs of special design. These operate in an oil bath enclosed in a brass housing. The clutch is provided with an automatic throw-out, which can be operated either by the foot pedal or the emergency brake lever. A universal coupling is used between the clutch and transmission. Large thrust bearings are used in connection with the releasing yoke.

The transmission is provided with four speeds forward and one reverse, and is of the selective type. The gears are enclosed in an oil-tight aluminum case, supported hy four arms on the subframe. The changing gears slide on a square shaft, which is hardened and ground. The same oil which lubricates the gears luhricates the bearings. All gears are heat-treated and are cut to a six-eight pitch and are pointed by an ingenious device to insure noiseless engagement. Parsons' white bronze bearings are used. A single hand lever operates all gears through the usual "H" type of quadrant. On the gearbox proper there is a simple locking system, whereby all gears except the one being engaged are held in a neutral position. Direct drive is on the fourth speed and tbe final drive is through a steel propellor shaft provided with two cardan joints. These joints are of liberal size, packed in grease and enclosed in a dust-proof case.

Other General Characteristics.—The steering gear is of the double internal worm type provided with ball bearings. The steering arm and spindle connection is located above the front axle, allowing the cross connecting rod to be located back of the axle, removing this member from any liability of contact with road obstacles. The spark and gas control levers are located on the steering wheel and operate through an inner sbaft and tube within the column. A mahogany dash is equipped with a kick switch and self-starting device button, which is located beside the oiler. Heavy brass-bound cork linoleum covers the floor boards; the toe boards are inclined at an angle of 30 degrees. The running boards, made of open grating steel, besides being exceedingly rigid furnish an excellent foot scraper to keep dirt out of the car. The front fenders extend well out beyond the front wheels, and, like the rear fenders, are provided with rigid splash aprons. Both fenders and hood are of aluminum-coated steel, which insures permanent retention of the paint and finishing varnish. The muffler is carried crosswise under the rear member of the frame. This distance of the muffler from the motor insures absence of back pressure and at the same time completely silences the noise of the explosions. All bodies are constructed of aluminum, touring bodies being of convex type.

The Model C, with a wheelbase of 112 inches, is made up in a five-passenger touring car, roadster and toy tonneau, wbile the Model D, with a 121-inch wheelbase, carries a seven-passenger body. Both models are equipped with enclosed bodies of different types, which are interchangeable with the touring bodies. The standard color is a dark blue body with French gray running gear. The touring cars are upholstered with hand-buffed hlack leather, water grained. The regular equipment includes five lamps, horn, gas tank and complete tool outfit.

Model D, Seven-Seated Moon Touring Car.

A NEW COMMERCIAL CAR CONCERN.

COLUMBUS, O., Dec. 14.—The Farmobile Manufacturing Company, an offshoot of the Oscar Lear Automobile Company, which holds the copyright on the name Farmobile, has just completed the fitting up of its plant at 580 Dublin avenue, and is now working on the first machines of a large order for the Pacific coast.

The officers of this company, which is capitalized at $200,000, are: President, C. J. Eastman, Los Angeles, Cal.; vice-president, W. J. Miller, former vice-president and general superintendent of the Oscar Lear Automohile Company; secretary, M. W. Kounds, president of the Ohio Manufacturing Company, and treasurer, James G. Stewart. These men, with David W. Jones, compose the board of directors.

The machine manufactured is used in all kinds of agricultural work, plowing, etc., the machine doing the work of a tractor. It will be equipped, it is said, with a rotary engine. It is well known that both Frayer and Miller have been working on the rotary valve problem for many years. The factory building is new and fitted with the best of new and up-to-date machinery. It is said that an order for 1,000 machines has been received.

NEW BASIS FOR POWER WAGON SALES A HIT.

DETROIT, Dec. 14.—The new scheme for selling its motor delivery cars which the Grabowsky Power Wagon Company bas inaugurated has made a hit in Detroit. The scheme in brief is a maintenance guarantee at a nominal charge, so the purchaser bas only the daily use of the car, with no other responsibility or worry. Among those who have taken up with this scheme is the firm of Peter Smith & Sons, groceries. This company once before tried out motor delivery in a very thorough manner and found it unsatisfactory.

Regarding the new proposition, Henry Smith expressed himself thus: "If we did not believe in the maintenance service we would not have placed the order, as our past experience was not satisfactory. But by this plan, which is guaranteed, we cannot lose. We realize the great benefits of motor delivery, and on the basis of this maintenance contract have ordered three cars for immediate use.

THIS YEAR GREATEST YET IN GOOD ROADS

WASHINGTON, D. C., Dec. 14.—The Secretary of Agriculture submitted his annual report to President Roosevelt to-day. It contains a great deal of information regarding the work of the office of Public Roads. Automobilists in general will be interested in the following excerpts from the report:

The Department, while endeavoring hy practical demonstration and scientific experiment to improve methode of construction and maintensnce, has lost no opportunity of awakening the public to a proper appreciation of the great economic importance of road improvement and the necessity for reform in the management of the puhlic roade.

Some conception may he had of the immensity of the task by considering the fact that there are 2,151,000 miles of road in the United States, a sufficient length to encircle the globe at the equator with 86 paralliel roads. The total expenditure upon the roads for 1904 was nearly $80,000,000. At that time about 38,600 miles had been surfaced with stone, 108,200 with gravel and 6,800 with special materials, making the whole mileage of improved roads only 7.14 per cent. of the total. An effort has heen made hy the engineers of the Department to estimate the miiesge of improved roads in 1908. Taking the 1904 figures as a basis, and assuming that the macadam roads have increased 12.5 per cent., the gravel 15 per cent., and those surfaced with special materials 25 per cent., we have 43,450 miles of macadam, 124,468 of gravel and 8,512 surfaced with special materials. The cost of the macadam has been estimsted at $4,500 per mile, of the gravel at $1,500 and of the other surfacing materiale at $1,000. There is ahout 1,975,000 miles of earth road, which it is estimated has cost for grading, culverts, bridges and all other items of expense an average of $500 per mile.

The destructive effects of automohile traffic on macadam roads have occasioned much uneasiness, as many million dollars have been expended in this form of construction. The enginsers of the department have, in common with others in this country and in France and England, conducted numerous experiments with a view to determining the exact cause of the deterioration of macadam roads and of devising methods of treatment or construction which would effectually meet existing conditions. Some measure of success has attended the work thus far, and it is hoped that much progress will be made within the next fsw years.

The relation of the puhlic roads to education is one which has largely heen overlooked. It is a more or less well-known fact that we have in all of our States a number of illiterates. While there is a numher of contrihutory causes to illiteracy, it is significant to note that in four States where the average percentage of improved roads is 30.35, the percentage of white illiterates is only 0.34 of 1 per cent. of the total population, and in four States, in which only 1.51 of the road mileage is improved, the per cent. of white illiterates is 4.76. It is prohahle that bad roads are partly a cause and partly an effect of ignorance, but it certainly appears that the two are closely related.

After describing the recent international good roads congress in Paris, and telling of the important part played in the congress by tbe American commission, all of whicb has heretofore been published in THE AUTOMOBILE, Secretary Wilson closes his report by saying:

"Considering the year as a whole, it is within the bounds of conservatism to say tbat far greater results have been accomplished than in any preceding year, and that the status of road work in general throughout the United States is more advanced and more promising for future development than in any year since the settlement of North America by tbe wbite man."

Lincoln Memorial Highway, Washington to Gettysburg.

WASHINGTON, D. C., Dec. 12.—An active campaign has been inaugurated to secure the appropriation of sufficient money by Congress to construct a Lincoln memorial highway from the White House to the Gettysburg battlefield. A balf a dozen measures with this object in view have been introduced in Congress and it is more than likely that one of them will receive favorable action before the one hundredth anniversary of Lincoln's birth in February next. Representative Lafean's bill provides that as a national tribute of affection toward Lincoln a great memorial highway not less than 150 feet wide be constructed from Wasbington to Gettysburg. His bill carries with it an appropriation of $3,000,000 to carry out the project.

MINNESOTA ROAD MAKERS BUSY THIS WEEK.

MINNEAPOLIS, MINN., Dec. 14.—The first annual meeting of the Minnesota Roadmakers' Association will be held in St. Paul for three days, commencing to-morrow. All persons interested in tbe betterment of Minnesota's roads will attend. Boards and county commissioners, city and village councils and other public bodies will send delegations and will take part in the discussions. County surveyors, road superintendents and road overseers are showing great interest. There will be a question box, and any one interested in any phase of road work or road building may communicate with the secretary, and later tbere will be an open discussion of all questions submitted. The program will include also a discussion of road drainage, construction and maintenance, bridge and culvert construction and legislation.

The King and Queen of Spain Alighting from their Renault in the Palace Yard at Madrid.

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"THINGS ARE SELDOM WHAT THEY SEEM."

It is a long way from even good grades of steel to some of the fine brands that found their way into crankshaft construction some two or three years ago. The supposition was that the superior steel, with its undoubted kinetic life, would render the crankshafts capable of sustaining as long as the cars as a whole. What a shock it was when the new, and more expensive, crankshafts failed in service. Not all of them, to be sure, but so many as to indicate that the finer grades of steel could not be relied upon to abort the incidents of service which did more to give a "black eye" to automobiles than any other one thing. Crankshaft failures, in view of their cost, did not go unnoticed by the average autoist, and the high price of the alloy steel kind served as a further incentive for effort to improve.

Naturally enough, designers reached the conclusion that they could use less of a better material, and those who failed to look into the matter at some length did use a diminished amount of the superior grades of steel. Strange to relate, it was the American designers who did not dip into the tank of fallacies, due in no small measure to the fact that they merely duplicated the sizes of their carbon steel crankshafts when they changed over to the other kind. It is not an easy thing to do without designing a new motor, this reducing the size of a crankshaft; and few were the designers that undertook the task. Abroad, where alloy steel was to be had for structural purposes, and for members in machines, designers used the same on a basis of its conventional physical properties, and less of the steel (in the section) that they naturally would were carbon steel all to be had.

The result was a crop of failures in high priced cars, mostly of the imported kind, so that the repair shops, of New York City in particular, were kept busy for a long time without any loss of profit to them.

It is not the idea to claim that the alloy steel crankshafts would not serve the purpose so much as it is to point out that a smaller section of the alloy steel failed to supplant carbon steel and eliminate crankshaft failures in service. As a matter of fact, the high priced alloy steel was a failure from the point of view involving a saving in quantity used, hoping thereby to compensate, in some measure, for the higher pound price of the same. In quantity sufficient, it is fairly satisfactory from the life of the crankshaft point of view, but dearly so at that, since by way of insurance the premium is high. Alloy steel in crankshafts means high first cost and high cost of replacement as well. If, then, it does not stand for long life, it fails to stand for anything tangible.

* * *

DOUBTFUL OUTLOOK FOR HIGH SPEED RACING.

It would appear that the manufacturers of Europe are about to discard high speed racing as an asset of continued value in the advance of the automobile industry. While the facts are somewhat vague, and for the moment partake of uncertainty, it begins to look as though the most substantial supporters of racing had decided to be observers rather than participants in any big speed events for next year; in fact, before anything definite is done towards the 1909 Grand Prix in France there must be a guarantee of not less than 40 entries, which guarantee, it would appear, is not likely to be forthcoming.

On this side of the Atlantic, the American maker has been a spasmodic supporter of speed contests, and the majority have come to the conclusion that it is a waste of time and money and a detriment to factory organization to supply hastily constructed racing cars for the purpose of having them defeated by the carefully built and well tried out racers of their European rivals. Savannah was an illustration of the ineffectual manner in which the Americans have contended against their foreign opponents. True, there was a success for America in this year's Vanderbilt race, but even the most ardent enthusiast is forced to admit that the field was international only in a limited sense.

The limit of speed has gone far beyond the point of sanity, and it is a question if the cost of high speed racing is compensated for by the publicity secured and the spectacular though temporary interest enlisted from the public. There is no question whatever but that contests of various kinds, such as endurance tours, economy runs, and hill climbs, are still beneficial in various parts of the country, and it would be a mistake to remove from the calendar all kinds of competitions, even though high speed events are relegated to secondary consideration.

AMERICAN MAKERS CONFER ON TARIFF REVISION

IN New York City, Saturday, December 12, the special committee known as the Automobile Manufacturers' Tariff Committee, appointed by the several associations of automobile manufacturers, held a session for the purpose of completing the brief which will be submitted to the Ways and Means Committee of the House of Representatives at Washington. Present at the meeting were the following: H. B. Joy, Packard Motor Car Company; A. L. Riker, Locomobile Company of America; E. H. Parkhurst, Peerless Motor Car Company; Benjamin Briscoe, Maxwell-Briscoe Motor Company; Alfred Reeves, general manager, A. M. C. M. A., and E. P. Chalfant, general manager, A. L. A. M.

It was reported that certain statements had been made which might tend to give a false impression as to the attitude of the automobile builders of the country toward tariff revision. In this connection Mr. Briscoe filed a copy of a telegram sent to H. E. Miles, of the National Association of Automobile Manufacturers, reading as follows:

"Knowing that an adequate duty to protect wages of American workmen, as against the existing low rate of wages in European automobile factories (which is admitted to be less than 50 per cent. of the American rate), is in practically universal demand by the American automobile manufacturers, I insist that your statement before the Ways and Means Committee implying you had information that a considerable portion of the industry was favorable to a tariff reduction on automobiles, is unfair, because it is not in accordance with the facts, and you should know it.

"I challenge you to produce any and all telegrams you referred to, substantiating your representations. I cannot believe that you would deliberately distort the facts, or that you intend purposely to convey a wrong impression, and I, therefore, await with interest a statement from you that will be supported by facts."

In an interview subsequently, Mr. Briscoe stated that it was the desire of the committee to supply all needed data that would enable the committee of congress to understand the subject thoroughly and be in a position to rule on it fairly.

"The automobile makers," said Mr. Briscoe, "have no desire to ask for an unfair rate of tariff, or for any special treatment. While the figures of wages in this country and Europe indicate that 60 per cent. duty would be necessary for adequate protection in the matter of labor, they do not ask for anything more than the existing rate of 45 per cent. As automobiles have come into use since the passage of the Dingley bill, they now come in under the classification of manufactured metals, and it is our desire to have them properly classified under the heading of automobiles and parts thereof.

"It is our belief that the tariff on automobiles should be one to protect the American workman against the low wages paid abroad. This is in accordance with the principles actuating a protective tariff, and is consistent with the doctrine of the party now in power. There can be no dispute as to the meaning of these principles and this doctrine, as set forth in the platform of the Republican party, and voiced time and again by President-elect Taft, who said 'that the Republican party is unequivocally for a revision of the tariff by a special session of Congress immediately following the inauguration of the next President,' and laid it down as 'the true principle of protection that such duties be imposed as will equal the difference between the cost of production at home and abroad.' And, moreover, 'to establish maximum and minimum rates to be administered by the President under limitations fixed by law, the maximum to be available to meet discriminations by foreign countries against American goods entering their market, and the minimum to represent the normal measure of protection at home; the aim and purpose of the Republican policy being not only to preserve, without excessive duties, that security against foreign competition to which American manufacturers, farmers and producers are entitled, but also to maintain the high standard of living of wage earners of this country, who are the direct beneficiaries of the protective system.'"

As indicating how close the foreign markets are to American trade, Mr. Briscoe pointed to the statement made by the representative of the importers when he appeared before the Ways and Means Committee, in which he stated that even a 12 per cent. reduction from the present tariff would be entirely satisfactory to the foreign makers. This statement was taken to imply that this small reduction was all that was needed to give the foreigners absolute control of the American automobile market.

There can be no contradiction of the enormous difference in wages paid in this country. "Carefully compiled figures," said Mr. Briscoe, "show that 11,400 men in American factories, and 10,347 men in European factories, received an average yearly pay as follows:

	America.	Europe.
Workmen	$755.05	$306.00
Commercial Employees	876.07	529.00
Technical Employees	1202.41	602.50

"This shows that the workmen in American factories are paid two and one-half times, approximately, what they get for the same work in the same kind of factories in Europe. Technical employees in the American factories receive approximately twice what they do in Europe, and commercial employees receive about one and three-fifth times what they do in Europe."

E. R. Thomas on Tariff Reduction.

BUFFALO, Dec. 14.—According to figures supplied by the E. R. Thomas Motor Company, in the year 1900 it occupied one floor of a three-story building at the corner of Broadway and Elm street, and gave employment to 60 men, including the office force. The total disbursements for that year, including the salaries of the 60 employees, material, advertising, etc., were $40,000.

The year 1908 shows 1,400 employees, with an expenditure of $2,315,367.14 for salaries, material, advertising, etc. The output of automobiles the first year was 75, which gradually increased until the year 1908, when the output reached the total figures of 950 complete machines.

Asked concerning a reduction in tariff, Mr. Thomas stated:

"I do not favor a reduction or increase of the tariff on foreign automobiles on account of French and Italian labor ranging from 7 cents to 10 cents per hour as against 25 cents to 35 cents per hour for American labor. The present tariff will not prohibit the importation of the surplus product of foreign manufacturers wherever they so desire. On account of the newness of the industry, out of the whole 200 manufacturers a limited number are firmly established on a profit-making basis.

"In my opinion the industry has hardly started in this country. There are 2,000,000 horse-drawn vehicles made annually in the United States, and, contrary to public opinion, over 1,200,000 of them are for transportation of individuals, and if the industry is given further opportunity for development with a comparatively few years, instead of turning out 50,000 per annum, the country will absorb 250,000 automobiles per annum, if unretarded by reduction of tariff and permitting foreigners to compete for all classes of trade. It is not the tariff, but home competition that regulates the cost to the consumer, for the reason that the foreign manufacturer charges a much higher price than the American for the same quality and character of machine."

Roller Bearings Makers on Tariff Reduction.

WASHINGTON, D. C., Dec. 12.—The Ways and Means Committee has received a number of communications during the week from manufacturers of roller bearings regarding the duty on anti-friction ball bearings. The Standard Roller Bearing Company, of Philadelphia, filed a brief protesting against any reduction in the present duty, and filed in addition a long list of American automobile manufacturers who use foreign annular ball bearings. The Timken Roller Bearing Axle Company, of Canton, O., and the Excelsior Steel Ball Company, of Buffalo, also filed lengthy briefs along the same line.

The Timken Roller Bearing Axle Company said, in part, that there are at the present time a number of factories in this country devoted exclusively, or to a large extent, to the manufacture of anti-friction bearings, including ball and roller bearings, as well as the manufacture of steel balls. This industry is comparatively new, having been carried on to any extent only during the past five or six years. The early growth of the industry was very slow, but owing to the large number of automobiles manufactured within the past few years, the business of manufacturing roller bearings has considerably increased.

The foreign makers of roller bearings have been engaged in this business for a much longer time than American manufacturers, and but for the protection of this industry afforded by the Dingley tariff law this industry would not now be in existence, as it would not have been possible to compete with the foreign manufacturer. By far the greater portion of the expense of manufacturing roller bearings is the cost of labor, a very small proportion of the entire cost being represented by the raw material going into this product. A member of the Timken organization tells of visiting a plant in France, where 2,000 hands were employed, and he found skilled labor working on machines at an average price of $3.75 per week. On these same machines and for the same work the Timken people pay an average of $15 per week. The present duty is 45 per cent. ad valorem, and the committee has been asked to raise this to 65 per cent.

DEATH BY TYPHOID OF JOHN B. ROWLAND.

NEW YORK, Dec. 14.—John B. Rowland, of the J. B. Rowland Advertising Agency, succumbed to typhoid fever on Saturday last, and the news of his death brought to light the fact that he was but one of a quintette of sufferers who contracted the fever at the same time, as the result of partaking of raw oysters at a dinner eaten at a New York hotel the day following election. The others were: A. B. Elliott, vice-president of the Witherbee Igniter Company, who died Thanksgiving Day; Herbert Lytle, the well-known racing driver; Louis A. Hopkins, formerly sales manager for the American Mors; and Thomas G. Wetzel, representing the Bronn-Lipe Gear Company and other interests, the latter three of whom are still suffering.

Mr. Rowland was the first to be stricken, but his case was not considered very serious, and up to within a few days of his death it was thought that he stood a fair chance of recovery. He was born in Washington, D. C., 31 years ago, and was a graduate of Georgetown University. About three years ago he entered the advertising business in this city, and made a success of it from the start.

Mr. Elliott did not show any ill effects of his experience until a fortnight after Mr. Rowland had been taken sick, but his case was considered dangerous from the very outset, and his death after a very short period of suffering did not come as a surprise to his physicians and family. Of the remaining three, Herbert Lytle is still in a hospital at Toledo, Mr. Hopkins is confined to his home in New York, and Mr. Wetzel is in a sanitarium in the same city.

Dr. Herbert L. Constable, who attended Mr. Rowland, and Dr. Belmont D. Bogart, who was Mr. Hopkins' physician, held a consultation and agreed that the fact that every one of the members of the party being taken ill at about the same time made it reasonably certain that the oysters had been infected.

NO FORD PLANT AT CAPE MAY, N. J.

DETROIT, Dec. 14.—There is no idea on the part of the Ford Motor Company to erect another plant at Cape May, N. J. Henry Ford and James Couzens recently made a 400-acre land investment at the New Jersey seashore resort, thus expressing their confidence in the future population of the "Mosquito State," which, by the way, is said to be rapidly losing its mosquito inhabitants. The land bought is north of the head of the new Cape May Harbor. The Pennsylvania Railroad is considerably interested in the development of Cape May.

POPE PRACTICALLY REORGANIZED.

HARTFORD, CONN., Dec. 12.—The reorganization of the Pope Manufacturing Company was practically completed this morning, a meeting of the stockholders having been held at the office of the company in this city. The new company is incorporated under the laws of the State of Connecticut and within a few days will acquire the property of the old organization. The Pope-Hartford motor car and Columbia and kindred bicycles will be manufactured. In about ten days the receivers of the old company will pay the fourth dividend on the approved claims, as well as interest of 6 per cent. on all debts covered by the four dividends.

The incorporators of the new company are Albert L. Pope, Colonel George Pope, Charles E. Walker and Wilbur C. Walker; thus the "old guard" remains in control. The amount of capital stock named in the incorporation papers is $2,500,000 of preferred stock and $4,000,000 of common stock shares at $100 each, of which 30 shares have been subscribed for the purposes of incorporation. It is stated on good authority that the full amount of stock is practically taken.

The stockholders at this morning's meeting were the four incorporators and Lewis H. Freedman, of the law firm of Joline, Larkin & Rathbone, of New York, who, besides himself, represented Harry Bronner, August Heckscher, Frederick H. Ecker, Albert Stickney, Henry V. Poor, Arthur W. Pope, Milton Ferguson. Albert L. Pope presided. A draft of the proposed by-laws of the company was presented and adopted, after which directors were elected as follows: For one year—Harry Bronner, Frederick H. Ecker and August Heckscher; for two years—Lewis H. Freedman, Albert Stickney and A. W. Pope; for three years—Henry V. Poor, A. L. Pope and Milton Ferguson.

A meeting of the directors will be held in New York during the coming week, when the officers will be elected.

The receivers of the company have gradually sold off such of the plants and property as was not necessarily needed to successfully carry on the company's business. The Hartford factory is now running full time and the Westfield bicycle plant is busy.

INDIANAPOLIS TO HAVE MORE AUTOS.

INDIANAPOLIS, IND., Dec. 14.—After a successful experiment with automobiles in various departments during the last year, Mayor Charles A. Bookwalter and the heads of the various city departments have decided to displace horses in municipal use as rapidly as possible with motor vehicles.

The Board of Safety has just purchased a Coppock truck, to be used in the firealarm and telegraph system of the fire department and will cover the entire city in that work. An additional police patrol wagon will be purchased about January 1, making two patrol wagons, a steam touring car, a gasoline runabout and a motor cycle in use by the police.

Bids are being received by the city board of health through Dr. Eugene Buehler, secretary, for an ambulance to be used by the City Dispensary. The city has grown so rapidly that the two horse ambulance used for some years is inadequate. If this ambulance proves successful, another one will be purchased for the city hospital.

HOW THE AUTO OPENS UP COUNTRY.

ALBANY, N. Y., Dec. 14.—A movement is on foot for the opening of an automobile passenger service between Albany and Berne, or Thompson's Lake. Prominent citizens of Albany are behind the scheme, which includes the installation of several large motor buses with a capacity of twelve passengers and two tons of freight or baggage. The probable route will be from Albany to Berne over the Helderberg Mountains, touching at Warner's Lake, and returning for the present by the same route. Later, upon the completion of the Thompson's Lake road, the return route will be from Berne to the lake and then back to Albany, crossing the mountains at a different point. The whole trip will be about 50 miles in length.

EARLY WINTER DOINGS OF THE AUTO CLUBS

ANOTHER FOR NEW JERSEY ASSOCIATED CLUBS.

HACKENSACK, N. J., Dec. 14.—Realizing that it is necessary for every autoist and every automobiling organization in the State to cooperate, if the results in the way of improved legislation that every Jersey autoist is anxious for are to be brought about, the Bergen County Automobile Club unanimously decided to join the Associated Automobile Clubs of New Jersey. The club is headed by Courtlandt Linkroum, Mayor of Hackensack, and has a membership of about 60 progressive autoists, the other officers being, vice-president, George Brinkerhoff; treasurer, George W. Johnson, and secretary, Austin W. Fishbough. W. C. Crosby, J. H. Wood and George A. Post, of Paterson, and H. A. Bonnell, of Newark, State officers, attended the meeting and found the members enthusiastically in support of a universal lighting bill. It was the general consensus of opinion that a large proportion of the users of horse-drawn vehicles would favor the passing of such a law once they were shown that it involved no extra expense for them, in that every horse owner is the possessor of a lantern.

The club also placed itself on record as being against the non-reciprocal clause of the Jersey automobile law, which holds up everyone at its borders while Jersey autoists visit other States unmolested. The advisability of amending the Jersey law in this and other respects came in for considerable discussion.

DENVER CLUB WILL ATTEND CHICAGO SHOW.

DENVER, COLO., Dec. 14.—The Denver Motor Club at the annual election Monday, December 21, will vote upon the following officers: President, R. W. Smith; vice-president, William D. Nash; secretary, Frank England; treasurer, C. P. Allen; board of governors, S. D. Hopkins, J. Nicoll Vroom, W. H. Sharpley, George Tritch, E. F. Dean and R. L. Taylor.

Among the guests at the club the past week were Harry E. Field, vice-president Hartford Rubber Works; F. M. Hoblitt, sales manager American Locomotive Company, of New York; A. O. Berlitz, of Chicago, representing the Locomobile Company.

A new motor vehicle law, patterned after satisfactory Eastern laws, has been drafted for the club by Attorney Frank England and will be presented at the next meeting of the legislature.

The members of the club will charter a special car to attend the Chicago national show in February. This will leave Sunday, February 7, and return as soon as the show closes, arriving in Denver in time for the opening of the Denver show in the Auditorium, February 16. The club will conduct the show this year and will have its train to Chicago and back suitably decorated with advertising banners.

LOUISIANA LEAGUE WILL BUILD ROADS.

NEW ORLEANS, Dec. 14.—At the recent meeting of the Louisiana Motor League great enthusiasm was displayed, this manifesting itself mostly in the endorsement of new good roads projects, and particularly the so-called Chef Menteur road. The new officers were elected first. These were: President, P. M. Milner; first vice-president, Sam Weis; second vice-president, Dr. Albert Mayer; secretary, Albert Aschaffenburg; treasurer, Henry Breckinridge, and these additional directors: Capt. John Dilbert, W. P. Stewart, C. H. Ellis, Dr. M. J. Magruder, Homer George, Sam Stone and Theo. Grunewald. The new president, Mr. Milner, addressed the league briefly and emphatically on the subject of good roads, which he declared to be their greatest need.

Two of the 20 miles from New Orleans to Chef Menteur have already been started, and the league pledged itself for the remainder; $2,400 was subscribed at the meeting and more promised. The greater source of revenue, however, will be the 500 new members at $12 each.

CLUB WANTS SHOW; DEALERS INDIFFERENT.

BALTIMORE, Dec. 14.—The Automobile Club of Maryland has appointed a committee, headed by Dixon C. Walker, to ascertain the best time and location for an automobile show in Baltimore. The members of the club are anxious for such an exhibition which they plan to hold some time after the first of next year. They will not have the cooperation of the dealers in this undertaking from present indications. Most of those engaged in the trade express the opinion that the New York and Chicago shows are quite enough for them to see the new styles, etc.

The club members are now engaged in a membership campaign. A silver cup has been offered as a prize to the one who gets in the majority of new members by May 1, up until which time no membership fee will be charged. The club expects to have 500 names on the roll at that time, which means that two hundred more members must be gotten.

It has been decided to remain a member of the American Automobile Association. In consequence of the efforts of the national A. A. A. committee to secure a uniform road map for the entire country and to get the cooperation of Congress in passing legislation to create a signboard for universal use, the local club has discontinued the work of placing signs at various parts of the State.

"MARMON WING" GETS A BAY STATE PRIZE.

BOSTON, Dec. 14.—The touring committee of the Bay State Automobile Association, which late in September conducted a twenty-four-hour endurance run that later developed into a week's test and resulted in a tie of three cars, has announced the award of the prize offered for the most consistent work on the part of any driver in the contest. The delay in making this award was due to the inability of the committee to obtain the votes of the observers any earlier, one observer sending in his vote from Miami, Florida. The prize, which is a gold watch, is awarded to Frank E. Wing, driver of the Marmon, who received seven votes of the nineteen that were cast. His nearest competitor was Jones, driver of the Studebaker, who received four votes. Wing drove his car through the original run without penalty and participated in the run-off, being put out of the contest after he had covered 804 miles. The work of drivers in the run-off was not considered in making the award.

GRAND RAPIDS ELECTS GOOD ROADS MAN.

GRAND RAPIDS, MICH., Dec. 14.—The election of officers of the Grand Rapids Automobile Club resulted in the election of the following: President, J. R. Jackson; first vice-president, L. C. Parmenter; second vice-president, G. L. Henzelmara; secretary, Dr. F. C. Warmshius; treasurer, Dr. Wm. Burleson, and Dr. D. E. Welsh and A. A. Barber on the board of directors. The new president is prominent in the good roads movement, vice-president of the Michigan State Automobile Association and a member of the A. A. A. Touring Board.

The club is in a prosperous condition, with a big membership and has a plan on foot for a new clubhouse to replace the loss of the Cascade clubhouse.

CHICAGO MOTOR CLUB'S ANNUAL ELECTION.

CHICAGO, Dec. 12.—At the recent election of the Chicago Motor Club the following candidates were victorious: President, F. C. Donald; first vice-president, Charles P. Root; second vice-president, David Beecroft; secretary-treasurer, Frank H. Trego; directors, H. B. Branstetter, F. C. Edwards, Paul Picard, Louis Geyler, J. V. Lawrence; auditing committee, Frank Martin, G. G. Temme and N. H. VanSicklen, Jr. President Donald in a short address disposed of all talk of a consolidation with the Chicago

Automobile Club, predicted the biggest year in membership and prestige for 1909, and promised the members an aggressive administration. The treasury has a very substantial balance.

CONNECTICUT AGREEABLE TO HIGHER DUES.

HARTFORD, CONN., Dec. 14.—The following is an extract from a letter written by C. H. Gillette, secretary of the Connecticut State Automobile Association, to F. H. Elliott, secretary of the A. A. A., under date of December 12:

"I have your letter of December 11 and regret to note that our State association has been reported as opposing the increase in dues in the A. A. A. As a matter of fact, at our last meeting of directors, held December 4, one of the directors opened an argument on this matter by questioning the increase. But the reason for it was very clearly set forth, and the board went on record as accepting the increase unanimously, and even went to the extent of passing a resolution pledging loyalty and support to the A. A. A. This resolution was the one adopted:

"Voted, That the treasurer be, and hereby is, authorized to pay, at the proper times, the dues of this association in the A. A. A. at the rate of fifty cents per year per member; and, further, that the secretary be, and hereby is, instructed to express to the president and officers of the A. A. A. the loyalty and support of this body.

"From the above you will note that the report that we are dissatisfied is entirely unwarranted, and in order to counteract any effect which the publicity of this report may have had, you are at liberty to give such publicity as you see fit to the above resolution and our confidence in the A. A. A."

PROCEEDING AGAINST MOTORPHOBE JUDGE.

POUGHKEEPSIE, N. Y., Dec. 14.—From the present appearance of the campaign which the Hudson Valley Automobile Club, of this city, backed by the New York State Automobile Association, are making against Justice of the Peace Hoppe, of Arlington, N. Y., it begins to look as if the judge will get all that is coming to him. It is said that he and his deputies have been overzealous in their arrests the past Summer, and the victims have organized, retained local and Albany counsel, and will proceed against him. It is stated further that plentiful resources are available to fight this contest out to a finish, and all persons arrested by Justice Hoppe during the past season are urged to communicate with the club secretary, E. O. Bartlett, Jr.

HARRISBURG RELIABILITY TO BE NOTABLE.

HARRISBURG, PA., Dec. 14.—It being generally understood that next year's Glidden tour will proceed westward from Chicago, the Harrisburg Motor Club will aim to make its annual reliability run the important Eastern tour of the year. This will be a four-day contest, held the first week in May, starting or finishing at Harrisburg, and visiting among other cities New York and Philadelphia.

The rules will provide for a schedule well up to the legal limit, with checking stations and observers, a technical examination at the finish, the exact number of points for each defect being specified, and in addition to these an actual tire record, which will be a contest for the tire manufacturers.

In past contests an efficient contest committee has been developed, and this tour will doubtless receive proper support, other clubs having been asked to co-operate.

ANNUAL DINNER OF THE LONG ISLAND A. C.

BROOKLYN, N. Y., Dec. 10.—The annual dinner of the Long Island Automobile Club was held to-night at the club rooms in Cumberland Street and was the most successful affair of the kind ever held by the organization. The welcome change from the customary course banquet was a beefsteak dinner, which was eaten with a hearty relish and undisguised appreciation by nearly two hundred members and guests. Charles Jerome Edwards, the retiring president, was in his usual excellent form as a toastmaster and graciously gave way at the conclusion of the speechmaking to the newly elected president, Frank G. Webb, who began his second term of office as the head of the club.

At the speakers' table were included Oliver A. Quayle, president of the New York State Automobile Association; Frederick H. Elliott, secretary of the A. A. A.; S. M. Butler, secretary of the Automobile Club of America; F. J. Wagner, the well-known race starter; Victor Breyer, of Paris; A. R. Pardington, general manager of the Long Island Motor Parkway, and A. G. Batchelder. These were duly introduced and made short addresses, that of Mr. Breyer being particularly well received.

Following the usual presentation of the annual cups came a vaudeville entertainment, arranged by Edwin Melvin, chairman of the house and entertainment committee. The new officials include William Schimpf as vice-president; Charles C. Cluff, treasurer, and Herbert G. Andrews, secretary.

How Long Islanders Looked as They Enjoyed Annual Banquet, Which Was a Substantial Beefsteak Dinner

HOW DETROIT WILL BUILD 50,000 AUTOS IN 1909

By CHARLES B. HAYWARD.

DETROIT, Dec. 14.—During the first half decade of the automobile industry in this country, assuming that the industry can really be said to have existed as early as 1900, statistics would be generous in placing the total output at half a hundred thousand machines, regardless of type. Before the next twelvemonth has passed, the manufacturers of Detroit alone confidently expect that they will have produced that many automobiles.

Owing to the unprecedented figures of the production planned by several of the leading makers and recently made public, a general impression has gone abroad that Detroit interests have enlisted the services of a skilled press agent and are talking "big," mainly for purposes of publication, and that the reality is bound to fall far short of the predictions. It is only natural that considerable difficulty should be found in accomplishing the task that some have set themselves—that the stretch from a few thousand to many thousand machines should present a gap that the majority will find it next to impossible to completely bridge, despite their most strenuous efforts in the line of multiple production on a basis of standardization.

Though many of the automobile surprises that have had sufficient stamina to outlive the limelight of their first uncovering at a show have emanated from Detroit, and the city has been able to lay undisputed claim to being the center of the American industry for the past three years or more, its ability to make such a jump as that contemplated naturally comes in question. How is it going to be done? Nothing but a look over the ground suffices to provide an adequate answer to the query.

According to statements published early in the season, Ford planned to turn out 25,000 cars; E-M-F, 12,000; Cadillac, 10,000; Gyroscope, 5,000; Chalmers-Detroit, 3,000; Brush, 3,000; Regal, 2,000; Packard, 1,500, while smaller makers who fall below the thousand mark, such as the new Herreshoff, may be combined as good for an additional 1,000, and one or two makers who are to blossom forth in Detroit within the next month or so will serve to further swell the total production. Taking the above figures as those decided upon by the various makers in question, early in the saeson, *i.e.* August or September last, it will be interesting to note what effect subsequent developments have had upon them. The conclusion arrived at by those outside of Detroit would naturally be that the majority of these estimates had suffered considerably in the interim and that the evaporation of some of the surplus moisture out of them would tend to bring the total very much nearer to a point that could reasonably be regarded as nothing more than the effect of a year's healthy growth under normal conditions.

Aggregate Production Will Be Increased.

It goes without saying that some of the estimates given above have suffered to a greater or less extent; not merely because their creators put them up originally with the sole purpose in mind of knocking them down at their convenience later, but simply because circumstances entirely beyond their control have made it impossible for the men who made the calculations to carry them out to the letter. On the other hand, some of the estimates have actually been increased by substantial percentages, while in others their formulators have seen no reason to lose faith in their ability to produce the machines in sufficient numbers to uphold their predictions. One of these is Henry Ford, who firmly believes that his company will be able to turn out 25,000 of the new model Fords between January 1, 1909, and the same date, a year later. But Mr. Ford's belief is based almost wholly upon his ability to get the new Ford plant in shape by February 1 at the latest. No matter how small it is, those who have had experience along this line, know that the task of building a factory and installing the machinery in it is one that is practically never accomplished according to schedule, and when the vast dimensions of the new Ford building are taken into account, together with the tremendous amount of equipment that it necessitates, it will be evident that, as is the case with most of the others, the cause of the Ford shrinkage will be delay in getting the manufacturing facilities in shape.

How the Figures and Reality Compare.

But to get back to the matter of predictions and actualities, as already realized by what Detroit's makers have accomplished in the time intervening between the publication of the above figures, the following tabular comparison of the advance estimates, and the opinion of an authority in a position to know what the various plants are capable of, makes two interesting parallel columns:

	Maker's Plans.	Estimated Production.
Ford	25,000	20,000
E-M-F	12,000	8,000
Cadillac	10,000	9,000
Blomstrom (Gyroscope)	5,000	2,500
Chalmers-Detroit	3,000	3,050
Brush	3,000	3,750
Packard	1,500	2,000
Regal	2,000	1,000
*Herreshoff	500	350

It will be noticed that in at least three instances, there are increases noted in the right hand column, instead of the shrinkage that might naturally be expected. From the dollars and cents point of view, the most substantial increase is that of the Packard, and while these conservative authorities will inform the inquirer upon application that the Packard total output will probably be in the neighborhood of 1,800, there are those who think it is far more apt to reach the figure given above. This year there are two Packards, the Packard "Thirty," and the Packard "Eighteen," though it takes a sharp eye to tell them apart, despite the smaller dimensions of the newcomer. It is expected that the Packard production will be divided between the two in about the ratio of three of the "Thirties" to two of the "Eigbteens." But in attempting to set a figure on how many new Packards will see the light before the end of the automobile year, it must be borne in mind that every machine turned out must go through the same prescribed routine as if it were the sole and only end of the efforts of its creators. In other words, production is closely limited by the thorough-going methods that have made Packard a word for excellence and under such conditions production cannot be advanced, except by a disproportionate increase in the facilities for manufacture. But these are now being supplied in the shape of a large steel and concrete structure in course of erection directly across the street from the Packard administration building, and which will form a notable addition to a plant already famous for its extent and equipment. Work will be carried forward on this new building regardless of weather conditions, and its completion at an early date should provide sufficient increase in the Packard facilities to bring the figures up to those given. There appears to be little doubt that Sales-manager Waldon will need more, even at that.

The Chalmers-Detroit is another instance in which an increase is to be found, the additional fifty cars being Chalmers-Detroit "Forties"—an excess of this amount over the original estimate of 500, the remaining 2,500 comprising the output of Chalmers-Detroit "Thirties." According to Mr. Chapin, one-third of this entire output has already left the factory, from which it will be evident that there will be a further increase over the estimate, if that is possible.

One Small Car Maker to Increase.

The growth of the Brush runabout figures as shown by the two columns is to be accounted for by the fact that plans have recently been made to add 750 of the Brush delivery wagons to the 3,000 pleasure runabouts previously contemplated, and as the machine tool equipment has already been installed in the new plant and things are running full force, results will doubtless more than suffice to fulfill the predictions made.

As is the case in figuring increase of speed with added power, it must be borne in mind that twice the machinery and

*The Herreshoff estimate is based upon six months' production.

twice the number of machinists does not necessarily mean a corresponding increase in the production possible the first year. Rapid and economical production has as its basis a well-perfected organization—something that cannot be built up over night. Automobile manufacturers have doubtless placed larger orders for machine tool equipment during the past year than has any other single industry, and men are being taken on as fast as they can be assimilated, but building up a smooth-running organization takes time and meanwhile production increases slowly—a fact that accounts for some of the shrinkages to be noted in the table. Take the case of the E-M-F as an instance. Salesmanager Metzger has given up quoting exact figures. "We are going to do the very best we can," he said. "Our minimum will be close to 7,000, for we must turn out that many cars to fill our orders, and we are going to build as many more as we can."

A trip through the part now running full blast gives some idea of how the task is to be accomplished, and also affords an inkling to the initiated observer of the prodigious amount of preparatory work that was necessary to bring things to their present stage of development, as everything has been planned from the very start with an extensive production in mind. Jigs, templates and other means of accurately duplicating the production of parts with the minimum expenditure for time and labor, have been perfected, and it is easy to see that this alone has involved the outlay of a great deal of capital, all of which had to be invested long before so much as the manufacture of the smallest part of the first car was undertaken. As an instance of the manner in which multiple production is being carried out, the milling of all three faces of eight of the twin-cylinder castings at a single operation may be cited, each of the castings being clamped in a jig that renders absolute accuracy of machining possible in every case. In a similar manner, machining of such parts as the aluminum engine bed, which have hitherto required several distinct operations, usually involving the use of a different machine tool for each, is now accomplished with the aid of a single jig and a single machine. Only one who is familiar with production as carried out on a small scale, and in the manner just described, can appreciate the tremendous saving of time and expense brought about by the heavy preliminary expense for jigs, the cost of which figures down to cents per car with quantities such as are now under consideration. But the accuracy thus made possible has not been taken advantage of in the case of the E-M-F to slight finishing processes, and every E-M-F motor is run on the stand in exactly the same manner as is customary with high-priced motors, before going to the test block to be run under its own power.

Ford Production Depends Upon New Plant.

Henry Ford is always bubbling over with optimism and enthusiasm, and he says "We are going to build 25,000 Fords" with the same easy assurance that he would tell you the new car is larger and better than its predecessor. And he means it, too. If it depended entirely upon Mr. Ford's efforts, there is no doubt but that the 25,000 machines would be forthcoming in the usual course of manufacture, but there are so many things entirely beyond the control of even the most ardent hustler and so many others—outsiders of course—who are not concerned whether Ford builds 25,000 or 25, so long as their part of the contract is fulfilled, that the task is far too much for one man to be expected to get away with and still survive. But Henry Ford and James Couzens have shown what can be accomplished and it will certainly be no fault of theirs if the reality falls short of the plans. Whether it is overrating their ability to concede that they can complete a new factory, move into it and still complete 20,000 cars in a year, remains to be seen. The four-story concrete, steel and glass building measuring 75 by 885 feet is to be ready for occupancy on February 1, and work will immediately be started on the new series of 15,000—if the building contractors toe the mark—there's the hitch. Everything is to be combined under one roof in the new plant, and it is to have a capacity of 300 cars a day—more than the total yearly production of many a maker not long ago. After an interview with Henry Ford, one expects to see automobiles as common as paving blocks upon getting out into the street, and in the vicinity of the Ford plant this expectation comes near being realized.

There can be no doubt, especially when viewed in the light of past achievements, that once the Ford organization becomes settled in its new home, Henry Ford's statement that 300 cars a day will be turned out should not fall so very far short of realization. When it is recalled that under the extremely congested conditions prevailing at the old plant, on Piquette avenue, it was possible to average 79 to 82 cars a day for weeks at a time during the rush season, and as many as 101 Ford runabout were completed and shipped in the course of a single working day, it will be seen that this prophecy is backed up by something considerably more substantial than mere opinion. Detroit's new figures of production are so startling that one immediately resorts to figuring to learn just how many cars a day must be completed to make them possible, and as 25,000 cars in a year means close to 2,100 machines a month, or practically an average of 70 complete automobiles a day for every day in the year, it will be evident that precedents are valueless.

Cadillac "Thirties" Coming Through Fast.

At the Cadillac plant, everything has been reduced to such a fine system, down to the very last detail of production, that if General Manager Henry M. Leland announced that he would built 50,000 cars in a year, anyone familiar with Cadillac methods would realize at once that the manufacture of every screw and nut necessary for that number of cars had been calculated upon long in advance and that the announcement was based entirely upon an intimate knowledge of just what the Cadillac facilities are capable of. And every one of those cars would be produced with the degree of accuracy that has made American methods of standardization in production famous the world over. There is probably no one at the head of an automobile factory in this country to-day who has a more lengthy experience in manufacturing and shop methods back of him than Mr. Leland, and there is doubtless no plant in the world where the machine tool equipment is kept so closely abreast of modern developments in this line. Instead of running a machine to a point where its value as a producer has dropped so far below modern standards as to make its immediate replacement imperative and its relegation to the scrap heap the only alternative, it is the Cadillac policy to dispose of all tools at second hand the moment their value has been depreciated by the advent of an improved type, even though the increased output be so small as to ordinarily warrant the retention of the old machine for many years. Multiple drills are prominent among the time savers in the Cadillac plant, there being one of 24 spindles, and a number of smaller sizes.

In refiguring the original estimate of 10,000 cars over, a cut of 10 per cent. was made, bringing the number of Cadillacs to be turned out down to 9,000 cars, and just how closely the production of these machines has been calculated will be evident from the manner in which deliveries have coincided with the original plans. Up to December 1, the schedule called for 300 cars, all of which left the plant by that date; from that time on the figure was 15 cars a day, and that has been averaged without variation right along. For January the production has been set at 20 cars a day, and the same figure will be adhered to during February, while for March it will be increased by 50 per cent., making the average daily production 30 cars. But by that time the capacity for producing will have been brought up to 35 cars a day, and ultimately the number turned out every working day will exceed 40 machines.

How great a force is necessary to make this possible may be gauged from the fact that at present there are 2,500 men working in the Cadillac factory in the day shift, and between four and five hundred at night, bringing the total close to 3,000 men. The night force is being added to as fast as the organization can absorb them, and by the end of the next month or two, it is planned to make the number on night work equal to half that of the normal day force, or a total of 4,000 men. This is but one plant and shows what the industry means to Detroit.

IS EUROPEAN AUTOMOBILE RACING AT AN END?

PARIS, Dec. 10.—Now that all details as to how, when, and where the 1909 races may be run, it only remains to be decided whether there shall be any races at all. The Automobile Club of France has a Grand Prix on its program for July, 1909; Italy bas the intention of holding races at Bologna; Belgium is preparing for another Ardennes meet.

But constructors all over Europe are signing an agreement not to race at all. It is somewhat ludicrous that wbile the racing board of the A. C. F., composed entirely of French constructors, and of those constructors who are most interested in racing, should be settling such details as the number of bridges over the Anjou course or the height of the barricades, their own factories are signing a declaration against any races in 1909. From a mere group the movement has now spread to practically all the large European factories, those having promised not to race in 1909, under a penalty of 100,000 francs, comprising Panhard, Renault, Brasier, Bayard-Clement, Darracq, Peugeot, Mercedes, Benz, Itala and Fiat. No mention of this boycott of racing was made at the international meeting, notwithstanding that hundreds of interested persons are asking what will be done next year, and automobile Europe is burning to know wbether tbis is the end of the racing game.

It is now announced that unless forty entries are obtained the Grand Prix will not be run in the Anjou district.

De Knyff Doubts if Forty Entries Are Made.

M. de Knyff, chairman of the sporting committee, is quoted as follows in the Paris *Herald:* "The situation is quite clear. All the leading houses of France do not desire to race next year, but if sufficient makers come forward before tbe end of the month the sporting committee is quite willing to organize the race. Personally I very much doubt whether forty machines will be entered."

Louis Renault said: "The decision is not astonishing. The sporting committee was face to face with a simple problem and dealt with it in a simple manner. If the requisite number of machines are engaged by the end of the year the race will be held. Firms which are anxious to race have only to come forward and the contest will be arranged."

Can Change Wheels Entire Next Year.

In next year's international races tbere will be full liberty to change tires in any way that appeals to the driver. He may pull them over a fixed rim in the old way, he may dismount the rim and tire together, or he may take off the entire wheel, in the manner dear to S. F. Edge, providing, of course, that the wbeel bearing is not interfered with. The decision has just been arrived at by the International Association of Recognized Automobile Clubs.

Resolutions were adopted which will make obligatory the use of Colonel Holden's electric timing machine in 1910. The machine, which has been in use at Brooklands track for several months, and is so sensitive that it will automatically register the passage of the front and rear wheels of a car traveling at 120 miles an bour, was brougbt before the International Association at its last meeting, and has since then been under observation in France. The decision was come to that where it is desired to have records recognized as international this machine must be used. It is impossible to put it into use everywhere for the coming season, and its adoption has been fixed for 1910.

FRENCH MAKERS DON'T WANT BUT MAY HAVE TO HOLD SHOW.

PARIS, Dec. 11.—A definite form has been given to the anti-show movement, and at the present moment fourteen automobile firms and two tire constructors have signed an agreement by which they guarantee to take no part in any exhibition in the city of Paris or surrounding neighborhood before May, 1910. An infringement of this rule will entail a penalty of $10,000, to be divided equally among the firms remaining true to the agreement. The step was decided upon at a secret meeting held in Paris durlng the Salon, those signing the agreement being Bollee, Brasier, Charron, Bayard-Clement, Darracq, Delaunay-Belleville, Dietrich, Gladiator, Gobron Brillie, Mercedes, Panhard-Levassor, Peugeot Company and Freres, Renault Freres, and the two tire companies, Michelin and Continental.

With this document in hand a deputation from the sixteen firms are about to wait on M. Gustave Rives and urge on him not to organize a show in 1909, and in future to leave a space of not less than two years between all Parisian automobile exhibits. If the authorities refuse to accede to the request, it will be the duty of the deputation to inform them that these sixteen firms, representing the cream of the French automobile industry, will refuse to take any part in the Salon. Everything is perfectly conceived for putting an end to the annual costly Paris exhibition, all details regarding penalties and the method of exacting them being worked out in the signed agreement. The body is sufficiently imposing, too, for the only large French constructor refusing to sign the document is De Dion Bouton.

A loophole, however, has been provided, and a loophole of such dimensions that the whole group can walk through without any difficulty. A clause hidden away in the agreement stipulates that the document sball not be binding, if, after negotiations, it is found that the Englisb constructors will not agree to abandon their show every other year. Further, it only requires a vote of three-quarters of those having signed the agreement to annul the entire movement. The Britisher has no objection whatever to the Frenchman signing his abdication, and will doubtless have ready sympathy when the deputation brings forth its objections against costly demonstrations. But to ask John Bull to sign away a show that costs little and brings much business, that is but seven hours' journey from Paris, and that is being promoted annually with the idea of transplanting the automobile market from Paris to London—to put such a proposition does not bespeak much sagacity on the part of the Frenchmen. The only conclusion is that as soon as it is realized by the French constructor that England has no intention of going into the bankruptcy court to please even the cream of the French automobile trade, it will be necessary to burn the mysterious papers on non-participation and forget that it was ever proposed to impose a fine on the firm seeking to increase its business by means of public shows.

It is easy to understand that the whole movement has thrown the automobile world into commotion, and accessory men, small car builders and cycle dealers are anxious about the future. The cycle men have already put it on record that if the official show is not held they will organize one of their own; the accessory men are favorable to an annual exhibition, and now the voiturette constructors, who really form a class by themselves, have decided to call a meeting to consider the question.

The Automobile Club of South Africa, with headquarters at Cape Town, is a very active organization. The membersbip includes all the prominent autoists in Cape Colony, and tbe club is very energetic in improving the roads.

PRESENTATION OF GRAND PRIZE CUP.

New York, Dec. 15.—Noted Savannahians have been in New York City this week as a result of the formal presentation of the Grand Prize cup to the Fiat Automobile Company, which entered the winning car driven by Wagner. The function took place Tuesday night at the Automobile Club of America, on West Fifty-fourth street, with Mayor George W. Tiedeman, of Savannah; F. C. Battey, president of the Savannah Automobile Club; W. B. Stillwell, its treasurer, and Harvey Granger, of the race committee, among those present. In the absence of Judge E. H. Gary, Vice-President Sanderson presided. Chairman Robert Lee Morrell made the presentation speech, and E. R. Hollander responded for the Fiat company. Chairman Morrell then presented medals to Louis Strang, of the Renault, and Joe Seymour, of the Simplex, whose cars were still running when the race was officially concluded.

Prior to the presentation ceremonies, moving pictures were exhibited and explained by Orrel A. Parker, chairman of the club's entertainment committee. A supper followed.

The Savannah visitors were entertained in the afternoon by a ride over the Long Island Motor Parkway. Incidentally, Harvey Granger was so well pleased with the Lancia roadster in which he rode that he completed arrangements for its purchase with Harry Fosdick before returning to the city.

SAVANNAH ESTIMATES ITS PROFITS $15,000.

Savannah, Ga., Dec. 14.—With the Grand Prize race over more than three weeks, the officials are beginning to check the profits made from the race. Several members of the committee are out of the city, and for this reason the exact amount cannot be given out until far in the new year. The sale of tickets for the grandstand will amount to over $18,000, while there were many tickets sold by railroads and steamship companies that have not been turned in yet.

It has been stated by some of the officials that no less than $15,000 will be cleared from the races when all the returns have been made. This money will be turned over to the advertising of Savannah all over the country.

The last of the men who were injured while speeding in the racing cars week before last are fast rounding into condition at the Savannah Hospital. Grinnon, who was hurt in Robert Burman's No. 8 Buick, and Thompson, who was with Hugh Easter in the No. 16 Buick, are the only ones left that have not fully recovered. Both of these men sat up at the hospital for the first time Monday evening, and seem to be in cheerful spirits. Both hope to be able to leave for New York soon. Mr. Easter is still in Savannah, looking after the injured.

LIVERYMEN ARE ALIVE TO SITUATION.

Chicago, Dec. 14.—Straws show which way the wind blows, and, similarly, little things show the tendency of the times. Looked at in this light, small facts assume large proportions. Thus in Chicago recently a liveryman named Daute, at the head of the Lakeside Livery, operating 40 horse-drawn rigs, and in business for the past sixteen years, announced his intention of disposing of horses in favor of taxicabs. The cars employed will be of the Thomas make.

Other livery men on the South Side are rapidly falling in line. Bain, at Indiana avenue and Twenty-third street; the White Livery Company, at Forty-seventh street and Champlain, and Emery, at Twenty-fourth and Michigan avenue, are among those who have been won over. The last, Emery, is rapidly disposing of his 35 horses, and now has four Studebaker and three Thomas cars. Others will fall in line as soon as the market for horses improves. as winter is a very poor time to sell. Many of these plan to buy second-hand cars, while still others propose to purchase the chassis only, utilizing the old cab bodies. This is not a small matter, either, as many of these bodies cost $1,000 apiece and would save the liverymen that much per car.

ADOPTS NEW RULES FOR 1909 BRIARCLIFF.

New York, Dec. 16.—According to information obtainable today, it is nnderstood that the committee in charge has definitely adopted rules to govern the entries for the 1909 Briarcliff stock car race. The chief features of these regulations are the exacting of a minimum weight figure of 2,600 pounds, while the minimum wheelbase is to be 110 inches. Where the size of the motor is concerned, a maximum for the 'oore has been adopted, this being 133 mm., or the approximate equivalent of 5¼ inches, there being no limit whatever placed on the length of the stroke. The limit in this year's Grand Prix race of the A. C. F. was 155 mm.

The special committee of ten appointed to manage the race held meetings on Monday and Tuesday, and it is understood that the foregoing represents the result of their consideration of the subject. This committee is headed by C. F. Wyckoff, of Wyckoff, Church & Partridge; the remaining members being Paul Lacroix, of the Renault Freres selling agency; H. A. Lozier, Lozier Motor Car Company; Harry S. Houpt, Harry S. Houpt Company; E. R. Hollander, Fiat Automobile Company; C. H. Tangeman, the Hol-Tan Company; Claire Hamilton, the Isotta Import Company; Walter Allen, the De Dietrich Import Company; H. U. Palmer, of the Palmer & Singer Manufacturing Company, and Percy Owen, of the Carl H. Page Company.

SHOW COMMITTEE ENTERTAINS GARDEN STAFF.

At a Hotel Breslin luncheon, Tuesday last, the show committee of the Association of Licensed Automobile Manufacturers was host to the staff of Madison Square Garden. This included James C. Young, secretary of the Garden company; T. J. Reynolds, superintendent; C. M. Schroeder, business manager; Antoni Pelligrini, in charge of the ticket selling; J. S. Stewart, electrician; W. J. Paxson, chief engineer; and a dozen more in charge of various departments, as follows: P. Christenson, F. Froelich, W. Schroeder, F. W. Fenn, W. J. Brennan, D. S. Houghton, J. Ostrander, Enos Josephs, Charles Specht, J. Smith, M. J. Pike, T. Jones, G. Fisher, J. A. Smith and J. Weil.

These men are only departmental heads, each having a staff of greater or lesser proportions under him. The perfection of the organization was revealed when the men talked about their work in connection with the show, and the suggestion was impressive that it must require a great deal of money to keep the machinery of such an organization running smoothly. E. P. Chalfant, general manager of the Licensed Association, presided at the luncheon, and others present besides those named were: Merle L. Downs, Coker F. Clarkson, Arthur N. Jervis, Montgomery Hallowell, W. W. Knowles, S. R. Ball, J. M. Carples, W. H. McDonald, H. M. Stevens, F. M. Stevens, A. F. Stevens, William Yeager and Charles H. Gresslee.

A NEW YORK CORONER SUGGESTS SPEED LAW.

New York, Dec. 14.—One of the best jokes sprung lately is the suggestion of the coroner who probably thinks to reduce his own work by this method. He suggested, and had Alderman Levine introduce, two ordinances, one to limit the speed of automobiles in the city to six miles per hour, and the other the speed at crossings and turns to one-third the legal limit, which would figure out to two mlles per hour. At these rates of speed people might as well walk and the automobile would die a natural death. Perhaps that is what the coroner wants.

AND WHEELING WILL HAVE TAXICABS.

Wheeling, W. Va., Dec. 14.—Not to be outdone by larger cities, Wheeling will have a taxicab service before the close of the year. A party of local business men interested in automobiles have formed a strong company and will at once put a conple of cars into service, others being added at short intervals as the service warrants.

POOR ROADS RETARD SELLING IN SOUTH.

CHICAGO, Dec. 14.—Among the large party of business men from Chicago which recently toured the South was W. Hildreth. Upon their return addresses were made before the Chicago Association of Commerce, and Mr. Hildreth, who is vice-president and manager of the Holsman Automobile Company, was among those who spoke. Being an automobile manufacturer, naturally his talk was mostly along the lines of automobiles and good roads. He found that the most universal obstacle to the auto in the South was the poor roads. Lack of prosperity was urged as a cause of backwardness in the use of motor cars, but Mr. Hildreth learned that this was not wholly true. Thus, the cities visited have shown a greater advancement in the past eight years than in any previous decade. Another fact was that where roads were good, machines were plentiful, and in the region of bad roads they were as scarce as the proverbial hen's teeth.

As a result of this trip he advised manufacturers that the only immediate and profitable market at present lay in the sections having good roads, and that money or energy spent elsewhere would be wasted. However, he advocated a campaign of education in the poor road districts as a source of future sales.

NEWS MADE IN GERMANY.

BERLIN, Dec. 8.—There is huge activity in aeroplaning circles in Germany, and besides all the apparatus known of, news of three new additions to their ranks has just come to hand. The military authorities are building the third airship under Major Parseval's guidance, while the Airship Battalion is about to start work on an entirely new system of aeroplanes, designed by Major von Gross, which is said to differ from all others. Added to this is the information that despite all denials, the electrical firm of Siemens-Schuckert has commenced carrying out tests with a new aeroplane of which great things are promised. Germany fully determines to be in the very front ranks.

Heated motor taximeters are being run on the streets of Berlin and are cutting out their chillier rivals to such an extent that all the cab-owners are thinking of fitting up their vehicles in a like fashion.

E. H. Gary, president of the Automobile Club of America, has been made an honorary member of the Imperial Automobile Club, Berlin, while its new women members include Mrs. O. S. Kerr, of New York, and Mrs. James Deering, Chicago.

MANUFACTURERS TRY OUT NEW TIRES.

NEW YORK, Dec. 14.—The marked progress being made by the tire manufacturers in the improvement of their product is well illustrated by a recital of the methods employed for testing out new models. Thus J. M. Gilbert and James Patterson, of the Continental Caoutchouc Company, of this city, left on December 12 on a trip to Buffalo and return, which will exceed 1,000 miles, for the purpose of testing out the new TC and AC flat tread tires. They drove a Lozier Briarcliff model equipped with these tires and measuring instruments for testing the heat created at various speeds, the expansion of the tires under service, the amount of air lost by road contact and other technical weaknesses.

OLDS AND A. L. A. M. PART COMPANY.

NEW YORK, Dec. 14.—The Olds Motor Works, of Lansing, Mich., and the A. L. A. M. have finally severed all connections. At the recent meeting of the A. L. A. M. board of managers the matter came up for discussion and was finally disposed of with the above result. The outcome will bring about some complications. One immediate result will be to involve agents who handle licensed cars in addition to the Olds. The Greene Motor Car Company, of Newark, N. J., for instance, has for this reason given up their Oldsmobile agency and will devote themselves exclusively to the Locomobile. The New York Olds agents will take care of this territory until a new agency is opened.

TO DISCOURAGE "TOURING" ACROSS CANADA.

SANDWICH, Ont., Dec. 14.—The Essex County Council has adopted a resolution asking the Ontario Legislature for an act permitting each county to regulate and license automobile traffic through its territory. This action is directed particularly against automobilists from outside passing through Essex County, and especially those touring from Detroit to Buffalo, many of whom have made nuisances of themselves.

As first introduced by Warden O'Neil, the resolution asked authority to charge a license fee of $25 on each automobile passing through the county. It was pointed out that, if adopted in each county, say between Detroit and Niagara River, this would make touring prohibitive, and the cost between Detroit and Buffalo would be about $300 in license fees. The resolution was finally adopted without naming a specific amount.

SPOERER CARS LATEST IN BALTIMORE.

BALTIMORE, Dec. 14.—Spoerer cars are the latest to be made in Baltimore. The firm making these cars is the Carl Spoerer's Sons Company, which has just recently entered the manufacturing business. The firm is making at present a four-cylinder car of two models, a tourabout and a 5 or 7-passenger Pullman body car. The car has not as yet been placed on the market, being put through a severe test on the local streets. The firm also contemplates manufacturing automobile trucks and automobile engines within the next year.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows and Meetings.

Dec. 31-Jan. 7..—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reeves, General Manager, 29 West 42d St.

Jan. 5.....—New York City, Fourth Annual Meeting Society of Automobile Engineers. (Will adjourn until January 19 after opening session.)

Jan. 16-23.....—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. M. L. Downs, Secretary, 7 West 42d St., New York City.

Jan. 27-Feb. 3..—Philadelphia, Second Regiment Armory, Eighth Annual Show, Philadelphia Automobile Trade Association.

Feb. 6-13.....—Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. S. A. Miles, Manager, 7 East 42d St., New York

Feb. 15-20.....—St. Louis, New Coliseum Building, Third Annual Show, St. Louis Automobile Manufacturers' and Dealers' Association. Lloyd Ricksrt, Manager.

Feb. 15-20.....—Detroit, Wayne Pavilion, Annual Show, Detroit Automobile Dealers' Association. E. LeRoy Pelistier, Manager.

Feb. 15-20.....—Cleveland, First Regiment Armory, Annual Show, Cleveland Automobile Dealers' Company.

Feb. 16-18.....—Denver, Col., Auditorium, First Annual Automobile Show, Denver Motor Club.

Feb. 18-25.....—Toronto, St. Lawrence Arena, Third Annual National Automobile, Motor Boat and Sportsmen's Exhibition. Ontario Motor League. R. M. Jaffray, Manager.

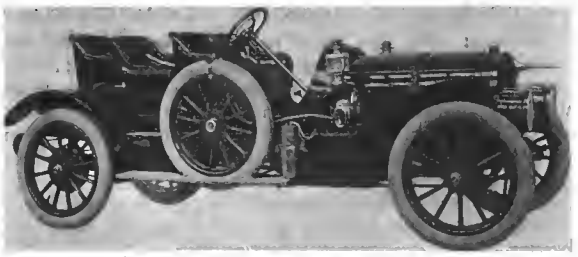
Mar. 1-6.....—Buffalo, Convention Hall, Seventh Annual Automobile Show. Buffalo Automobile Trade Association.

Mar. 6-13.....—Boston, Mechanics Building, Seventh Annual Automobile Show, Boston Automobile Dealers' Association. Chester I. Campbell, Manager, 5 Park Square.

Mar. 27-Apr. 3..—Pittsburg, Duquesne Garden, Automobile Show, Pittsburg Automobile Dealers' Association.

Races, Hill-Climbs, Etc.

Jan. 1-2.....—Philadelphia, Two-day New Year's Run of the Quaker City Motor Club.



New Four-Passenger 45-Horsepower Rambler for 1909.

THE LATEST RAMBLER MODEL.

A new Rambler model just announced by Thomas B. Jeffery & Company, which will be first shown and demonstrated at the New York branch, 38-40 West Sixty-second street, during the period of the New York automobile shows, is a 45-horsepower car with four-passenger or close coupled body and Rambler spare wheel as a part of the equipment.

Its lines are quite exclusive, as is also the color combination—dark Brewster green, black effect, striped in orange, with orange wheels. The spare wheel, locked on the side, adds individuality. The npholstery is highly finished smooth leather wbich contrasts strongly with the bright orange of the wheels. In short, this Rambler is just a little different from any other car and to use a slang term, it is quite entitled to be described as "sporty." That the combination of a very light four-passenger body of this type with the 45-horsepower Rambler chassis is both unusually speedy and powerful scarcely calls for mention, as that fact is quite evident upon a glance at the above picture.

A HOUSEBOAT ON WHEELS.

One of the newest things in convertible bodies is that built by a Florida man, N. H. La Grand, of Jacksonville. This is in substance a houseboat on a Franklin cbassis. The bouseboat part of the outfit La Grand built himself, taking balf of each day from his business to work on it. Working at it thus he took fifteen months to build it and spent $3,700.

This strange vehicle is used by the owner, both as a place of business and a residence, the interior, of mahogany, being so arranged tbat it may in less than a minute be converted to a working, a dining, a sleeping or a touring car. Despite this the car weighs but 2,300 pounds and is very fast.

The Sharp Edge, as La Grand calls it, thus indicating his business, a dealer in razors, has plate glass windows, silk curtains, electric lights and other modern conveniences tbat one would not expect to find in a home-made product of this sort. Tbe cut shows this unnsual body.

"The Sharp Edge"—A Florida Man's Practical Idea.

NEW ONE-TON TRUCK MAKES APPEARANCE.

BUFFALO, Dec. 14.—To meet the requirements for a truck lighter than their three-ton machine, the Autocar Equipment Company, of Buffalo, builders of commercial vehicles exclusively, have brought out the one-ton truck, of which the cut shows one of the six delivered to a transportation company. This follows standard light truck lines in having the motor forward under a bonnet, selective type of transmission, chain drive, etc. The motor is a four-cylinder 25-horsepower unit, with individually cast cylinders, and is an excellent piece of work. Transmission of power then is to a sliding gear transmission, giving three speeds and reverse. The final drive is by double roller chain (Baldwin) from sprockets on the jackshaft to the rear wheels. The latter are fitted with large internal expanding emergency brakes, operating on the toggle principle and lined with hard fiber. The service brakes are of tbe band type and work on a pair of brake drums located on the jackshaft.

The wheels are of the artillery type of seasoned second growth hickory, with 14 1 3-4 spokes, and are equipped with 36 by 3 1-2-inch solid rubber tires all around. These wheels run on plain bearings on the axles, which are both of the square section forged steel, 1 3-4 by 1 3-4 inches. Tbe springs are of the best quality

New One-Ton Truck of the Auto Car Equipment Company.

of spring steel, 2 1-2 inches wide, witb 1-4-inch leaves, the number varying for front and rear, according to the load to be carried.

This firm is one of the few committed to the armored wood frame. They use on this car ash sills 1 3-4 inches thick by 5 inches high, reinforced by a 3-16-inch plate of sheet steel on the outside. This frame is narrowed at the front to take the engine without a sub-frame and also to increase the steering lock. The steering is accomplished by means of an irreversible steering gear of the worm and sector type, with wood steering wheel on an aluminum spider. This carries also the spark and throttle control levers.

A gear pump circulates the water through the cooling system, the principal feature of which is a square tube honeycomb type of radiator. Ignition is by jump spark, two sources of current being provided, storage battery and dry cells. A roller type of timer is used.

The body, painting and trimming vary with each job, the car shown having a comparatively small body, about 4 feet by 8 feet, back of the driver, and being painted very plainly in black, with a dark green stripe and light running gear. The tailboard as shown is hinged and may be used to carry stuff, or it may be made removable for hauling lengthy merchandise. The car is fitted with storm curtains of a heavy black duck.

This firm also has under construction a lighter car of a capacity of 1,000 pounds, which will follow along the same general lines as the one just described. The details of this car are not yet available, tbough it is stated that a light gasoline motor will form the power plant.

How a Philadelphia Merchant Used His Elmore to Cut Fodder.

Frank Hardart, of Horn & Hardart, Philadelphia, has put into practical uee an idea that occurred to him when he needed some fodder cut on his farm a few milee outside the city. He backed up his Elmore into position in line with the fodder cutter, jacked up one of the rear wheels, and run a belt from it to the pulley on the cutter. The work required to get the machine into operation wae practically nothing and the result all that could poesibly be desired by the experimenter.

Ran a Steamer Cheaply.—A letter from Leon T. Bunnell, of Terryville, Conn., gives some figures for running a steamer which figure out very advantageously to that form of motive power. Mr. Bunnell with a Locomobile steam runabout, having a special 14-inch kerosene burner (F. W. Ofeldt & Sons, manufacturers), ran 4,500 miles last Summer at a total expense as follows:

Fuel—250 gallone kerosene at 9c.	$22.50
Repairs	25.00
Tiree, oil, waste, etc.	60.00
	$107.50

This figures out an average cost per mile of 2.4 cents. As nearly all of this driving was over New England hills, some very steep and rough, with two passengers all of the time and sometimes three, this is an excellent record. The mileage it will be noticed works out to 18 miles per gallon, which is another record that will stand a whole lot of beating.

Many Packard Tours Abroad.—The past has been a lean year for the hotel men and others in France who make their living off the tourists. For this reason the Frenchmen feel kindly towards the Packard car, as more owners of these cars have toured the Continent than any other this season, no fewer than 175 Packard parties having been registered at the Paris headquarters. Consequently, the well known slogan, "Ask the man who owns one," translated *"Interroges l'homme qui en possede,"* has become equally familiar over there. These tours have ranged from 2,000 to 8,000 miles over all the popular and some unusual routes. But even as a result of these long tours, the repair shop affiliated with the Paris office has complained that they did not get any work to do, for there was no need of repairs. From this, the Frenchman in charge,, L. Bousquet, draws the interesting conclusion that they must be well built.

New Lease of Life.—The Auto Parts Mfg. Co., of Muncie, Ind., formerly the Muncie Auto Parts Company, has bought a number of new patents for automobile parts which have never been included in a mannfacturer's list before. The plant has been overhauled thoroughly, a number of new machines installed, and a lot of workmen added to the already large force. The original company was one of Muncie's infant industries, and at one time the big plant on South Elliott street, north of the L. E. and W. R. R., was operated day and night. A new lease of life, with an infusion of new blood, among whom is Dave Henry, sales manager, will undoubtedly revive this once flourishing concern.

A Bold Robbery in the Metropolis.—T. P. C. Forbes, Jr., of 1657 Broadway, New York City, is mourning the loss of his 40-horsepower American roadster, which was stolen from the curb at Sixth avenue and Thirty-eighth street last Friday. The car had the regular underhung body and was painted a dark Brewster green. The number on the engine is 402, and the license tag 48,578. The car had 36-inch wheels with 4-inch rear tires and 3½-inch tires on the front. At the rear of the car the tire holder was fastened on the trunk rack. Mr. Forbes would appreciate the receipt of any information regarding the whereabouts of the car.

Auto Makes Progress in Far West.—A story from Fresno, Cal., vouched for as true, tells that in one of the local agencies a bunch of salesmen were sitting around smoking when a sheep inspector with more whiskers than most anything else blew up in a one-lunger Cadillac and asked to have lamps and generator put on right away. He was politely told that on account of the pressure of work it couldn't be done.

"Well, what am I going to do," he inquired, "I've got to tend to my business." Some one suggested hiring a horse and buggy. "Oh ——" said the disgruntled sheep inspector, "I can't depend on a horse." Just for that they fixed him up.

Had to Build an Addition.—The New Process Raw Hide Company, Syracuse, N. Y., after operating its plant nights for several months and having the largest payroll in its history, has been obliged to build a large addition to its present factory. This will be a modern steel construction with cement floors, two stories and basement, 60 by 80, adding 14,000 square feet of floor space to the east end of the present factory. They have contracted for some $12,000 worth of new machinery, principally automatic machines, gear planes, and grinders. A hardening furnace for transmission and driving gears will be one of the features. It is expected that the new building will be ready for occupancy by February 1 or thereabouts.

Harriman's Faith in Motor Cars.—As an instance of the belief of E. H. Harriman in gasoline or other liquid fuel for railroad use, it may be noted that within the coming months he will spend a small fortune in experiments at the Omaha, Neb., motor car shops. He expects to excel in speed and economy of operation anything that has yet been produced. What this will result in is hard to say, for M. C. No. 8 has a 6-cylinder 12 by 14-inch motor, rated at 230-horsepower and travels at a speed of 65 miles on .45 gallon of gasoline per mile, carrying 75 passengers

Many Motor Patrol Wagons.—Not to be outdone by the larger cities, like Chicago, which has just received its third motor-patrol wagon and ordered number four, the town of Richmond, Va., has ordered a patrol wagon. The contract was recently awarded to the American Locomotive Company. The decision to have the motor-propelled rig, made after due deliberation by a body of conservative men, shows plainly that the commercial vehicle is gaining advocates daily, purely on its merits.

Matheson Increases Capital.—The Matheson Automobile Company, of Wilkes-Barre, Pa., announce that they have recently increased their working capital by $350,000, thus enabling it to more than double the previous factory output. By thus increasing production, the concern is able to make the astonishing cut of $1,000 in the price of their 50-horsepower car and to do this without any sacrifice in the quality. The guarantee for one year will be continued, despite this great reduction.

Actors Beating the Pullman Company.—The Walter Hale Company, now on tour with "The Wolf," are trying a new stunt of going from city to city by automobiles. After playing in New Haven, Conn., recently, they made the trip to Poughkeepsie, N. Y., in four hours in a 40-horsepower Studebaker. The trunks, scenery, and lesser lights traveled by railroad, while the leading players made their own schedules and beat the poor Pullman Company out of their hard-earned cash

Grout Behaved Perfectly.—W. J. Gould, sales manager of the Grout Automobile Company, Orange, Mass., has just returned from a demonstrating trip with the 1909 model of shaft-drive car, calling on the several agents from Boston to Philadelphia, covering in all, including demonstrations, 2,200 miles. The car behaved so perfectly that every agent called upon placed his contract for 1909, requiring the hiring of more help at the factory.

Price of the Corbin Baby Tonneau.—In stating the prices of the new Corbin models for 1909 in connection with the description given of this car in THE AUTOMOBILE, December 10, it was made to appear that all three listed at the same figure, *i.e.*, $2,500. While this is true of the touring car and the roadster type, the price of the baby tonneau model should have been given as $2,650.

Professional Automobile Engineers Elect.—At the recent annual election in New York City of the Society of Professional Automobile Engineers, these officers were elected: President, Ed. Traphagen; first vice-president, Robert J. Dobson; second vice-president, John McClarity; secretary, George Strobridge; treasurer, Eugene Nassoy; chairman examinating board, Otto Zinamerellis.

Fire Chiefs Will Use White Steamers.—Two White Steamers will be used by Chief Horton and his deputy of the Baltimore fire department in responding to fires, according to specifications just given out.

The department will also be provided with two ambulances, one to hurry injured firemen to the hospitals and the other to remove injured horses to a veterinarian.

Airships.—The American representative of the Clement-Bayard, Sidney B. Bowman, has just returned from Europe and has announced that the Automobile Company has gone into the commercial manufacture of airships. The S. B. Bowman Company will act as the foreign agent for these airships, and, in fact, is now promising delivery in three months.

Baltimore to Have Locomobile Police Patrol.—A 60-horsepower Locomobile police patrol has been ordered for the Baltimore Police Department from Callahan, Atkinson & Company, agents for the Locomobile. The car will cost $5,500 and have a seating capacity for 12. It will be used in the Central district, and a garage will be built for its storage.

Maxwell Dealers to Meet at New York.—The annual convention of Maxwell dealers, a regular institution in connection with the A. M. C. M. A. show, will be held Tuesday, January 5, at the Hotel Manhattan. The most important item in the discussions will be the new and unusual sales organization, inaugurated by Benjamin Briscoe.

A Question of Accuracy.—The accuracy of the automobile to-day and the interchangeability of its parts are directly due to the use of fine tools. As a sample, it might be noted that the Cadillac Motor Car Company have just placed an order with Brown & Sharpe for $6,000 worth of snap gauges, a total of 1,500 of them being required.

Not a Moment's Trouble.—F. M. Sinclaire, of Schenley, Pa., after driving a Winton "six" 8,000 miles, says: "I have not touched anything under the bonnet, and have had no trouble with engine or ignition. The engine has not missed once, and the original spark plugs are still untouched."

Another Girl in the Auto Business.—The Ajax-Grieb Rubber Company, of Trenton, N. J., are sending out to the trade a handsome large lithographic hanger. This represents another of the Ajax girls and is the prettiest one of the bunch.

IN AND ABOUT THE AGENCIES.

Locomobile's New Boston Home.—The Locombile Company of America, which was obliged to vacate its branch house and garage at 400 Newbury street because of a court order, has established new Boston headquarters at 589 Boylston street in Copley square, and there K. M. Blake, the Boston manager, will be found for the present. The new salesroom is in an excellent location. The reason for giving up the new garage and salesrooms on Newbury street was because adjoining land owners secured judgment against the owner of the garage on their claim that in building such a structure the owner violated restrictions upon the land.

Franklin, Philadelphia.—Since the Automobile Sales Corporation succeeded the Quaker City Automobile Company some months ago, former agents of the Franklin, that car has been unrepresented in the Quaker City. A deal was put through last week whereby James Sweeten, Jr., and H. G. Clark, under the firm name of the Franklin Motor Car Company, will handle the Franklin in the Philadelphia district, with temporary quarters at Thirty-seventh and Spruce streets, opposite the University of Pennsylvania. Ground will be broken for a permanent steel-and-concrete building at Thirty-fourth and Chestnut streets within a few weeks.

Some New Franklin Agencies.—The Franklin Mfg. Company will be represented in the following cities in 1909, in addition to others previously mentioned: Bloomsburg, Pa., C. W. Funston; Lancaster, Pa., Lancaster Auto Company; Geneva, N. Y., Geneva Automobile Company; New Haven, Conn., Holcomb Company; Bridgeport, Conn., Blue Ribbon Garage, 283 Fairfield avenue; Canton, O., Diebold Motor Car Company; Washington, D. C., Cook & Stoddard Company; Waterloo, Ia., Moore Auto Company; Jamestown, N. D., Lenz-Land & Loan Company; Salt Lake City, Utah, Consolidated Wagon & Machine Company.

Great Western, Peru, Ind.—The Model Automobile Company, of Peru, Ind., manufacturers of the Great Western car, has secured a number of new agencies for 1909, among whom one is made prominent by her sex; viz., Mary E. Carlton, who will handle this car in Rochester, N. Y. The others are all "mere" men as follows: Alden, N. Y., Bennet Manufacturing Company; Newfane, N. Y., W. H. Collins; Freeport, Ill., William Ott; Waterloo, Ia., A. Burhyte; Kansas City, Mo., B. L. Colaw; Goltry, Okla., J. H. Santee; Calgary, Alberta, Canada, T. H. Graswick.

Benz, America.—The Benz car, that famous product of the Benz Company, at Mannheim, Germany, which has produced such a stir lately, will be actively pushed in America from now on. The exclusive agency and sole sales right has been given to Jesse Froehlich, known in the trade as managing director and treasurer of the Times Square Automobile Company, of New York and Chicago. Mr. Froehlich now has the Benz racer driven at Savannah by Hemery on exhibition at the salesroom, 1599 Broadway, New York City.

Mitchell, Jacksonville, Fla.—This town is very much elated over the rumor that the Mitchell Motor Car Company, of Racine, Wis., will soon establish a distributing house here to supply all of the Southeastern territory, as well as the West Indies. This rumor was started by the trip of J. Mitchell Lewis, president, and J. W. Gilson, sales manager, to Jacksonville upon the completion of the week of racing at Savannah.

Post & Lester, Boston.—Beginning January 1 Post & Lester will conduct a wholesale as well as a retail branch in Boston. The old quarters in Boylston street will be given up and new addresses will be: Wholesale, 288-290 Devonshire street; retail, Park Square. Mr. Thompson will continue as manager with charge of both places, while Russell Green will be chief of staff of the retail department.

Hardy Moves to Larger Quarters.—The R. E. Hardy Company, manufacturers of the Sta-Rite plugs and other accessories, have been obliged to increase their factory space. This has now been tripled and their office and factory address changed to 201 Thirty-seventh street, Brooklyn, the New York office at 25 West Forty-second street being continued.

Jewel.—The Forest City Motor Car Company, of Massillon, O., manufacturers of the Jewel, has added these agencies to their list: Rhodes Implement Company, Kansas City, Mo., and W. M. Kidwell, Savannah, Ga. The former will have the territory of Western Missouri, Kansas and Oklahoma, while the latter will look after Savannah and vicinity.

New Agencies for Goodrich Tires.—The B. F. Goodrich Company, of Akron, O., has established agencies at Kansas City, Minneapolis, Atlanta, and Pittsburg. The Atlanta office is located at 64 South Pryor street, and will be managed by E. V. Wilkinson. The Pittsburg branch is at 5900 Penn avenue, and will be in charge of H. L. Banker.

Mitchell, Philadelphia.—In pursuance of its plans to offer every facility to Mitchell owners, not alone in Philadelphia, but in the nearby towns as well, the Penn Motor Car Company, agents in the Quaker City, has just opened a branch in Media, Delaware county, and placed it under the charge of J. H. Fleming.

Motor Truck Company Expands.—William H. Murphy, of Ithaca, has acquired a quarter interest in the Chase Motor Wagon Company, of Syracuse, N. Y., which has recently been reorganized with an increased capital stock. Mr. Murphy, who has been appointed secretary and a director of the company, will have charge of the sales department.

Pennsylvania and Gyroscope, Boston.—Among the new companies in Boston, is the Auto Motor Company, who have just opened a salesroom at 12 Park Square. The company will handle the Pennsylvania, and George H. Lowe, of the company, will personally handle the Gyroscope.

Reo, Southern States.—After December 1, the Reo will be represented in Tennessee, West Virginia, Kentucky, and Southern Indiana by the Renners Automobile Company, of Louisville, Ky. This company will also have the Louisville agency for the Haynes.

Oldsmobile, Kentucky.—The Oldsmobile Company, of Louisville, Ky., is now a branch of the factory and has established agencies at Nashville, Chattanooga, Memphis, and Knoxville, Tenn., and also at Birmingham and Mobile, Ala.

Oldsmobile, Du Bois and Johnson, Pa.—The Du Bois Repair Company will represent the Olds Motor Works in Du Bois, Pa., and the Johnstown Automobile Company will handle the same product in Johnstown, Pa.

Sultan Company Moves.—The Sultan Motor Company is now located in new and larger quarters at 249-251 West Sixty-fourth street, New York City.

PERSONAL TRADE MENTION.

George Ostendorf, well known in the automobile trade and for the past two years a traveling salesman for the H. H. Franklin Mfg. Company, of Syracuse, has left that company to become secretary and general manager in charge of sales of the Brunn Automobile Company, of Buffalo. This company as the Brunn Carriage & Manufacturing Company has a long-established carriage trade. They have recently branched out into motor cars and will handle the Franklin in 1909. While with the Franklin Company, Mr. Ostendorf traveled in New York and Pennsylvania.

F. C. Gilbert, sales manager of the Pope Motor Car Company at Toledo, O., who used his efforts toward the re-establishment of the business during the period of receivership, has decided to resign from the company, severing his connection therewith early in January next. Mr. Gilbert has not decided upon his future plans, and at present is located at 2268 Parkwood avenue, Toledo.

Bertram Bailey has accepted a position as engineer with the Four Traction Automobile Company, of Mankato, Minn., manufacturers of four-wheel drive touring and commercial cars. Mr. Bailey was formerly with the Bailey Automobile Company, of Springfield, Mass., turning out two-cycle cars.

Herbert Bingham.—The G-L Economizer Company, of 1412 Times building, New York City, announces to the trade that Herbert Bingham has severed his connection with said company, having resigned as secretary and general manager of the same.

R. J. Skelton, who was formerly with the Chadwick Engineering Works, at Pottstown, Pa., has now assumed the position of city sales manager of the Philadelphia Olds Motor Works branch.

Albert A. Lamb has accepted the position of general manager of the J. S. Griffen Company, of New York City. Mr. Lamb leaves the Michelin Tire agency at Newark to take up this new work.

M. B. Hatch, the Buffalo agent for the Chalmers-Detroit, has added another good man to his list in the person of Harry C. Bacon, formerly with the Buick agency.

OBITUARY.

Mrs. W. McK. White, wife of the well-known automobile editor of the Philadelphia *Times,* died in Philadelphia recently of pneumonia after a two weeks' illness. Mrs. White apparently was out of danger, but suffered a relapse, which terminated fatally. Mr. White has the sympathy of many friends in the industry.

R. Lindsay Coleman.—One of the pioneers in the automobile world, and formerly a leading figure in the bicycle industry, died recently at his home in Somerset, Va. Until its comparatively recent failure, he was at the head of the National Battery Company, of Buffalo, N. Y.

TAXICABS AND TRANSIT.

St. Louis.—The Mississippi Valley Automobile Corporation, of St. Louis, Mo., according to J. H. Phillips, vice-president, will start this coming week an up-to-date line of taxicabs. The present plans include the immediate use of five cars, the remainder of a lot of 25 being put into service as they arrive. The cars will be equipped with the Popp taxameter and the fares charged will be the same as in New York and Chicago. The company have taken a large shop on Olive street in the heart of the automobile district.

Denver.—A taxicab company is to be started in Denver, Colo., on or about January 1. The new company has elected these officers: President, F. A. Austin; vice-president, E. W. Reynolds; secretary, treasurer, and general manager, B. J. Reynolds.

Bridgeton, N. J.—The citizens of Bridgeton are interested in the formation of a motor 'bus line between that town and Salem.

GARAGE NEWS OF ALL KINDS.

Pittsburg, Pa.—A. H. McKellit and R. E. Dinger have bought the garage and business of the Central Automobile Company at 5909 Centre avenue, East End. Fred D. Rathbun, a well-known automobile salesman for the Columbia Company, of Hartford, will be in charge. The retiring partners, C. L. Seeley and C. D. Messenger, will go into other business.

Sag Harbor, N. Y.—William Blacklock, Sag Harbor, Long Island, has purchased three lots on lower Main Street, near the railroad terminal and will start work on a new hrick garage and machine shop.

Cincinnati, O.—Among the latest to announce a new building is the Cincinnati Automobile Company, agents for the Peerless, Pope, Hartford, and Oldsmobile cars.

Baltimore, Md.—The Zell Motor Car Company, of Baltimore, Md., is having plans prepared for a three-story 50 by 100 garage on Mt. Royal avenue.

Redondo, Cal.—Work has been commenced on the erection of a new garage for the Pacific Motor & Automobile Company, of Redondo, Cal.

Des Moines, Ia.—The Capital Automobile Company, Grand avenue and Eighth street, has just commenced work on a new building.

BUSINESS DIFFICULTIES.

New York City.—Schedules in bankruptcy of Max Wineburgh as the American Automart, supplies and a garage at 1621 Broadway, New York City, show liabilities of $14,181 and nominal assets of stock, etc., totaling $6,950. Outstanding accounts cannot be figured, because the firm's books were stolen.

Charlotte, Mich.—The Dolson automobile plant and real estate will be sold at auction by Receiver Hathaway. It is probable that the Charlotte banks, the heaviest creditors, will bid in the property. Liabilities amount to approximately $140,000.

Hartford, Conn.—A petition in bankruptcy has been filed against the Auto Body & Top Mfg. Company, of Hartford. Liabilities $4,641, assets $9,513.

THOMAS AGENCIES FOR 1909.

Among the concerns which have announced the dealers who will push their product for next year is the E. R. Thomas Motor Company, of Buffalo, who swing into line with no less than 75 authorized agents. These are: Albany, N. Y., Auto Storage & Trading Company; Akron, O., Union Auto Garage Company; Austin, Tex., Ewell Nalle; Atlanta, Ga., F. C. Steinhauer; Boston, Whitten-Gilmore Company; Baltimore, Motor Car Company; Binghamton, N. Y., L. R. Clinton; Brattleboro, Vt., Manly Bros.; Beatrice, Neb., Wm. Steffen; Boise, Ia., Randall Dodd Auto Company; Chicago, W. W. Shaw Company; Cleveland, Auto Sbop Company; Chattanooga, Tenn., F. G. Joyce Auto Company; Denver, Colo., Matbewson Auto Company; Davenport, Ia., Iowa Auto & Tire Company; Des Moines, Ia., Moyer Auto Company; Duluth, Minn., Mutual Auto Company; Dubuque, Ia., Wallis & Culbertson; Detroit, Grant Bros. Auto Company; Erie, Pa., Murphy Bros.; Ennis, Tex., Earl Fain; Glens Falls, N. Y., Glens Falls Auto Company; Harrisburg, Pa., Ideal Motor Car Company; Hartford, Conn., Palace Auto Station Company; Huntington, W. Va., L. A. Walcott; Indianapolis, Indiana Auto Company; Jamestown, N. Y., Jamestown Garage Company; Kansas City, Mo., Central Auto & Livery Company; Kalamazoo, Mich., W. E. Kidder; Louisville, Ky., John M. Strauss; Los Angeles, Cal., R. A. Brassey; Minneapolis, Minn, Barclay Auto Company; Memphis, Tenn., Memphis Auto Company.

To continue with the agents in the United States there are: Milwaukee, Wis., W. L. Hibbard Motor Car Company; Newark, N. J., Harry S. Houpt Company; New Haven, Conn., W. A. Maynard; New Orleans, Crescent City Auto Company; New London, Conn., New London Auto Station Company; New Castle, Pa., C. E. Smith Hardware Company; New York City, Harry S. Houpt Company; Oklahoma City, Okla., Buick Oklahoma Auto Company; Omaha, Neb., H. E. Frederickson; Oil City), Pa., W. P. Lucas; Portland, Me., J. A. Dowling; Philadelphia, Pa., Bergdoll Motor Car Company; Portland, Ore., H. L. Keats Auto Company; Peoria, Ill., J. H. Bontjes & Co.; Providence, R. I., Davis Auto Company; Pittsburg, Pa., Pittsburg Auto Company; Poughkeepsie, N. Y., J. van Benschoten; Portsmouth, O., W. I. Friel; Punxsutawney. Pa., P. O. Freas; Reading, Pa., Penn Auto Company; Rochester, N. Y., A. V. Hart; St. Louis, Mo., Park Auto Company; San Francisco, Cal., Pioneer Auto Company; Scranton, Pa., Scranton Auto Company; Syracuse, N. Y., Syracuse Auto Cab Company; Springfield, Mo., Colonial Motor Car Company; Sioux City, Ia., H. B. Groves & Co.; Saginaw, Mich., Norris Auto Company; Topeka, Kan., N. S. Wear; Terre Haute, Ind., Terre Haute Auto Company; Toledo, O., Kirk Bros. Auto Company; Utica, N. Y., Utica Motor Car Company; Vincennes, Ind., J. N. Dyer; Worcester, Mass., L. W. Locke; Washington, D. C., Motor Car Co.; Williamsport, Pa., E. Keeler Company; Youngstown, O., Standard Auto Garage Company.

In South and Central America and the Philippines by these agents: Argentine Republic, Pratt & Cia.; Mexico City, Mex., Moher & De Gress; Honolulu, H. I., Van Ham-Young Co., Ltd.; San Juan, P. R., Wm. J. Wulf.

RECENT INCORPORATIONS.

Maxwell-Briscoe Motor Vehicle Company, St. Louis, capital $15,000 to buy and sell automobiles. Incorporators are V. Heinrich, L. L. Milks, H. M. Paine, of St. Louis; J. J. Handley, of Newcastle, Ind.; Benjamin Briscoe and J. W. Wellington, of Tarrytown, N. Y. This company has plans completed for the erection of a building 100 by 150, to cost $15,000, but for the present will have its headquarters in the American Garage Co.'s building.

Pierson Motor Supply Company, New York City, capital $20,000, to manufacture motors, engines, machines, automobiles, cars, wagons and boats. Incorporators: F. W. Mills, H. M. Brown and E. J. Forhan, 154 Nassau street.

Hurlburt Company, Portland, Me., capital $400,000, to deal in automobiles and carriages of all kinds. Incorporators and officers: President, C. E. Eaton; treasurer, T. L. Croteau; clerk, J. E. Manter, all of Portland.

Grabowsky Power Wagon Company, Buffalo, capitalized at $25,000, to manufacture and sell automobiles, power wagons and motor boats. J. D. McDonald, J. F. Valley and John Moore are interested.

A. J. Deer Company, Hornell, N. Y., capitalized at $120,000. Buffalo and Hornell men are interested in this company, which will manufacture motors, electric novelties, machinery and dynamos.

Bradley Tire Protector Company, Fort Worth, Texas, capital $20,000, to manufacture steel tire protectors. C. E. Bradley, Houston street, is secretary.

Self-Loading Wagon Company, New York City, capital $25,000, to manufacture motors, engines, machines, cars, wagons and boats.

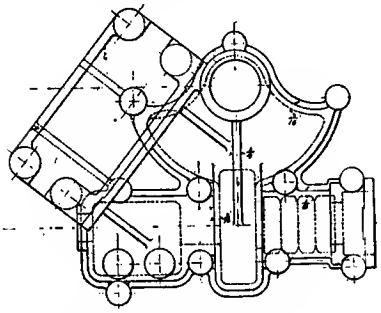
Butler Electric Clutch Company, Yonkers, N. Y., capital $50,000, to manufacture elastic clutches invented by W. W. Butler.

Lexington Motor Car Company, Lexington, Ky., to conduct a livery and garage, and also assemble a car to sell at $2,500.

Boutjes-Hayes Automobile Company, Peoria, Ill., capital $2,500, to manufacture automobiles, parts and accessories.

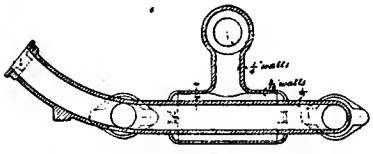
INFORMATION FOR AUTO USERS.

Something About Hess's Steel Castings.—Since 1867, when the first steel castings were used for crossing-frogs by the Philadelphia & Reading Railway, from the plant of William Butcher down to the present time, steel castings have served for many useful purposes, but they would have



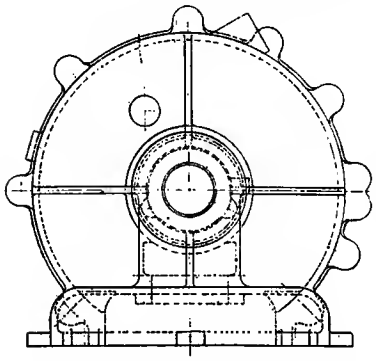
HESS STEERING GEAR HOUSING.

had a far wider range of application were it not for the difficulty involved in obtaining sound castings in intricate shapes, or in the cases involving complicated cores. In late years, because of a better understanding of the situation, the percentage of "wasters" has been much reduced, primari-



END PIECE OF TRANSMISSION CASE.

ly, in view of perfected details in design that indicated more nearly uniform cooling conditions. In the process of evolving steel castings, while uniform cooling is particularly desirable, the fact remains that the "shrink" is not only more than that attending cast iron, but it is far less regular as



EXHAUST MANIFOLD WITH INTAKE PREHEATER.

well, and so it seems the steel casting problem has remained formidable, notwithstanding the improvements wrought.

Henry Hess, of Twenty-first street and Fairmount avenue, Philadelphia, has submitted illustrations of intricate specimens of steel castings which he claims can be readily made by a new process, recently acquired by him, during a sojourn in Germany. In the language of Mr. Hess, the substance of the project is clearly set forth as follows:

"Steel castings ranging from dead soft to self hardening steel, weldable, any specification realizable in wrought or forged material, any section; thick, thin, abrupt change from thick to thin, clean surfaces, no pits, absolutely solid 3-32 below skin, simple or most complicated coring, any shape that can be forged, or cast in any material."

Mr. Hess states that pending the establishment of a foundry in America for the purpose of furnishing castings in accordance with the above claims, deliveries will be made directly from Germany with a view to filling orders. At any rate, the requirements of American manufacturers will be carefully looked after.

Prest-O-Carbon Remover.—The pedestrian hates a smoky exhaust. If he was "onto" his job, the chauffeur or man running the car would dislike it just as much, for it means work for him later. That is, a smoky exhaust is caused by a surplus of oil or of fuel, usually the former, and this, if continued for a long time, will result in carbon deposits. These may be in the cylinder itself, on the piston head, or on the valves. Wherever they occur it means dismantling the motor and scraping them. At least it has meant this in the past, but now we have a new solvent for the carbon, known as a carbon remover, which may be inserted in the cylinder by means of an oil gun or poured in through any suitable opening. Among the carbon solvents that have been proved good is the Prest-O-Carbon Remover, Prest-O-Lite Company, Indianapolis, Ind. This is put up in liquid form in sealed cans holding respectively a quart, half gallon, or gallon, and should stand for 30 minutes. This works by softening the deposits, then when the engine is started the loose particles of carbon are blown out through the exhaust valve opening. As this saves the work of tearing the whole engine down, cleaning, and assembling it again, with the consequent loss of the use of the machine for a couple of days, these solvents will doubtless become very popular with automobilists.

PREST-O-CARBON REMOVER.

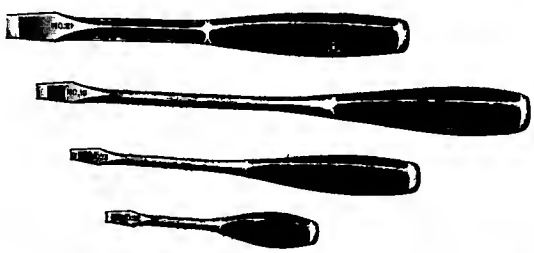
Grand Prix Horn.—The Motor Car Equipment Company, of 1727 Broadway, New York, states that its new "Grand Prix" wheel-shaped horn is now in great demand. As may be seen from the cut, this horn has a very odd shape, and has also good noise-making qualities. It

"GRAND PRIX" WHEEL-SHAPED HORN.

makes a fine racing horn because it can be blown in the face of the strongest wind, and is also admirably adapted to low racing tourabouts. This horn will undoubtedly appeal to automobilists desiring a novelty as well as a serviceable article for practical use.

Acheson Graphite Greases.—The International Acheson Graphite Company, of Niagara Falls, N. Y., is making what it believes to be a very superior line of Graphited Greases. The company blends very soft, pure, amorphous, unctuous Acheson-Graphite with a high grade grease, the product being one which it claims is very far superior to graphited greases made of natural graphites, as these latter contain friction-creating impurities, while the graphite is guaranteed at least 99 per cent. pure, thus being the purest and best graphite in the world for lubricating purposes. The claim is made that these new Graphited Greases will do far more work than any other grease because the Acheson-Graphite used is a true lubricant in itself, the grease simply acting as a carrier. Acheson-Graphite, Grade "1340," is claimed by the makers as the world's purest and best graphite for lubricating purposes.

B. & S. One-Piece Screwdrivers.—All steel one piece screwdrivers in eleven sizes, specially designed for automobilists' use, are the latest productions of the Billings & Spencer Company, of Hartford, Conn. For more than a quarter century the "B. & S." trade mark has been a synonym for high class products, and the new line of drivers will meet a ready welcome with discriminating buyers. They are made in one piece, and drop forged of steel, the handles being of a new and special design which insures lightness, a positive, easy grip, which cannot get out of order, become loosened, or lost. As will be seen by the illustrations, the handle portion has the section of a cross, but on the heavier models the sides are left solid, giving a square section on which a wrench may be used. The smallest size is 5 inches in length and the longest 18 inches for general use. In the machinists' sizes with squared handle sections, the lengths are 9 1-2 and 10 1-2 inches.



ONE PIECE "ALL STEEL" AUTOMOBILE S. & S. SCREW DRIVERS.

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THE AUTOMOBILE

ITALY *for the* AUTOMOBILIST

By FRANCIS MILTOUN

ITALY for the automobilist is not France, not by a good deal. Its roads are not French roads, and its hotels are not French hotels—more's the pity! And you pay two prices for everything that matters to the automobilist. Gasoline comes in the American five-gallon can of commerce that you find in China, Dahomey—and Italy, and here you pay for five gallons a price often double what you pay for a more volatile spirit in France. Oil—any old kind—costs a franc and a half a kilo, which is dear or not, according as to where you have done most of your automobiling in the past, but as it does not give as good results, nor go so far as that you get in France, so oil, too, works out as high-priced as gasoline.

You buy all these things at a drug store or a grocer's. That is, you can buy them there if you wish, and at a better price than at the average misnamed "garage," which in Italy is often an establishment where they sell sewing machines, agricultural machinery, baby carriages, and bicycles. In the small town you are bound to go to the drug store for your supplies, but as you can get your quinine at the same time—which you will have need of in fairly large doses—it does not so much matter.

All these variations on the automobilist's ordinary procedure are not so serious as to take away entirely from the enjoyment of automobile touring in Italy. The worst is the fact that a larger extent of bad road will be encountered in a week's touring in Italy than will be met with in a month in France.

A Typical T. C. I. Road Sign.

Italy's hotels, taken by and large, are neither so good nor so reasonable in price as those in France, and you invariably pay for garaging your machine two or three francs a night—which you are not often forced to do in France—and often you'll be obliged to stable your automobiles outside the hotel, in an inferior and most incommodious shelter.

What weather one will have along the road in Italy and notably in the Campagna depends entirely upon what God wills. No Italian peasant professes to be a weather prophet. "Ah, Signore," he says, invariably, "chi lo sa?" For this reason an automobilist in Italy must be prepared for meteorological surprises. "Domini Deo!" you say when you strike a bad road and you praise God for the good. *Avanti* is ever the watchword in Italy. You mustn't stop for an occasional bit of bad road. It won't improve, at least not while you wait.

The above are some of the bad points of automobiling in Italy. For the good things of life let us be fair and admit that Italy does not lack them utterly. Their infrequency is what mitigates against one's appreciation of them; or does it work the other way about? It all depends upon the individual mood.

A dozen, twenty or fifty kilometres of good road through Æmelia suddenly descends into a mere trail. That is a bad piece of management and you think so when, after you have had a dozen kilometres of it, it suddenly becomes good again. Maladministration, the poverty of a certain haliwick, or indif-

ference or incompetence on the part of some one in power accounts for this state of affairs.

You buy your gasoline along the route, usually at 14 francs the five-gallon tin, when suddenly, without any warning, and without a thought on your part as to the propriety of asking the price beforehand, you are mulcted 18 francs for the same thing. You put that down to bad management, too, a sort of a sacrificing of the goose that lays the golden egg. You suffer, perhaps in silence, or perhaps not, but some day the thing will regulate itself and the next comer will have no such trouble. One hopes! Automobile touring in Italy is still in a chaotic stage; good in parts and bad in parts, like the curate's egg.

You occasionally find a very good hotel, with ample courtyard accommodation for your automobile, well-sheltered and well-lighted, where you yourself lodge and feed comfortably and well at a reasonable price (higher than in France for the same accommodation, however), but at you very next stopping place you are "exploited" and made to eat beefsteak and fried potatoes when what you wanted was a chicken and a dish of macaroni and a salad. You are put to bed in a regal apartment with electric lights everywhere. And with all this pretended luxury you are forced to put your automobile in an outhouse with loose straw and broken bottles. It takes all kinds to make up the gamut of one's automobile and hotel experiences in Italy. One does not speak, of course, of the palace hotels of the Quai Parthenope or the Lung' Arno; they are in another class, but they are nothing Italian, and are not what one comes to Italy for.

It simply comes to this: one has got to take chances when touring Italy in an automobile. If he keeps to the large towns and frequents only the tourists hotels he is sure of a certain cut-and-dried conventionality, neither good nor bad, btu dull. But if he makes his stopping place for a meal or a night at Barberino di Mugello in the Tuscan hills, or at Subiaco back of the Alban Mountains, near Rome, he does take chances. He may fare well or ill, but he won't be exploited unduly, and will probably be well cared for, indeed, humbly but amply; the food will have character; the wine will be good, though perhaps strong; and to be lodged in some quaint beam-ceilinged old room of a mediæval chateau will give one the pleasantest of dreams.

There is a good thing to say of the garages of the cities, those of the Garages Ruiniti, Fiat, Alberti, Storero, at Turin, Milan, Genoa, Padua, Florence, Rome, and Naples. They can hardly be excelled by any similar institutions to be found anywhere. It is to be regretted one cannot give the same praise to a den of bandits conducting a so-called garage at Pisa. The hotels are forced to send the inquiring automobilist there because there is no other. There is one hotel that won't do so any more. *Verb sap.* Automobilists, don't put off until Pisa anything that by any human means you can as well accomplish before or after or go without. Of these other most excellent garages it can be said that their accommodations are ample and luxurious, prices moderate and invariably uniform, and stocks of tires and accessories most complete. What more does an automobilist want?

In Italy, of all countries, this is to be appreciated, and would be in England, where the gas-fitter mechanic is still allowed to hang out his shingle and tamper with the intricacies of a ten thousand-dollar auto whenever a confiding stranger of that ilk is obliged to leave one in his bands.

In Italy, as in France, one finds in garages a real mechanic, one who has a knowledge of automobiles and their functions. No gas-pipe threads or bolts come from his hands. Give him time and he will cut a "Whitworth," a "standard" or a "Metric" thread for an odd-sized bolt for an American or English car, and will not hammer or force it unwillingly into place. The Frenchman is a good automobile engineer and mechanic, but the Italian is running him close, else why would the Fiats, Italas, and Isottas be gathering the plums that they are.

Not every automobile tourist in Italy covers the entire country in his wanderings. Naples, Rome, Florence, Padua, and Venice; or Florence, Bologna, Milan, Como, and then Switzerland are the usual itineraries followed, and because of their directness (there is one road through Æmelia 32 kilometres in length and perfectly straight and flat), and conventionally much that is really Italian is missed, and much that is the same thing that one gets elsewhere in Europe is included. In the articles which make up the series of Italian itineraries here outlined are four chief routes, which may be combined or taken separately, according as to where one makes his respective exit and entrance. They have been connated by personal observation, and barring the changes which may be expected to arise from the change of seasons, or such as are brought about by even brief intervals of time, they may be depended upon to lead out of many pitfalls that might otherwise cause annoyance and delay. They cover the best of Italy, on and off the beaten track; the roads are of the best—and the worst; there is the seashore, the mountain, and the plain.

If one would push on further and descend into Calabria, be must be prepared to take chances—not necessarily with brigands, though perhaps he may have some experience of them, too—with very, very many of the conventional discomforts of travel. One must literally be as tough as hickory, as patient as an owl, and with the stomach of an ostrich, if he is to come back safe and sound and wholly satisfied with bis round from, say, Naples to Reggio in Calabria and back again, or to Otranto and Brindisi. The thing is worth doing, however, by any one with sporting proclivities, though the road is easier to follow than to ride over. But one can do it.

The following hints as to ways about will be useful:

For maps, get the French-made "Carte Taride d'Italie." It is in three sheets, covering all of Italy, including Sicily, and is printed in three colors. It is very easy to read, plainly

ROYAL ITALIAN AUTOMOBILISTS

marked and cheap, costing only a franc a sheet. It does not distinguish the good roads from the bad as well as it might be made to, and many of the minor crossroads are omitted altogether, but in general it is a very satisfactory map, and the most legible of any made covering Italy up to the present writing.

For absolute accuracy there are no road maps of Italy as good as those issued by the Touring Club Italiano. They are presented gratis to members of that excellent organization, and sold at a low price to outsiders. The objection is that it takes 58 sheets to cover Italy. The hills between 4 per cent. and 7 per cent., and those above 7 per cent. are marked plainly, the altitudes are given throughout, and the great lines of communication by road are marked as to the quality of their surfaces.

Another similar series of Italian road maps is the "Carta d'Italia Sistema Becherel-Marsieni," scale one 250,000ths, 35 sheets, printed in colors, with a system of roads classification, and selling at a franc a sheet. It is similar to the Italian Touring Club map and is everywhere obtainable. For this reason it will perhaps best serve the visiting automobilist who has not provided himself with maps before hand.

Guide books for the automobilist in Italy are as follows: The most useful of all is the "Annuario di Touring Club Italiano," with plans showing exits and entrances to all the chief cities and towns, the location of the principle hotels, garages, etc., besides a mass of useful contributory information.

Next in importance, and of inestimable value, are the three volumes published by the Italian Touring Club, entitled "Strade di Grande Communicazione," with detailed itineraries, and illustrative profiles of the elevations along the road, showing all rises and falls in an unmistakable manner so that he who runs may read.

Baedeker's or Murray's guide books have little or no information of value to automobilists, though some of the large scale maps of certain regions in the former may be found useful in making excursions from a center. In this class are the maps of the Italian lakes and the environs of Naples, Rome, Florence, etc.

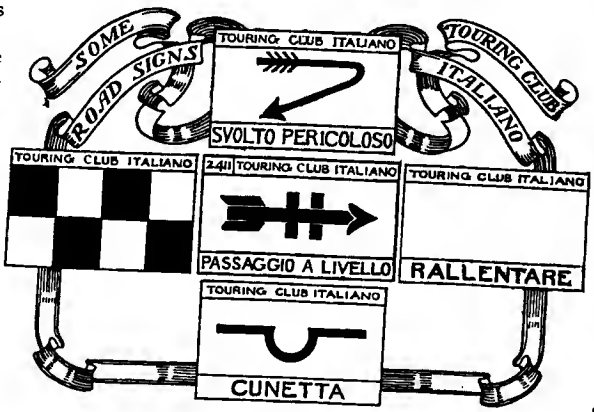
For hotel lists there is nothing to be compared with the "Annuario" of the Italian Touring Club, but those given in the "Annuaire pour les Pays Etranger" of the Touring Club de France and of the Automobile Club de France are good as far as they go. Joanne's "Italie" (in French) lists Italian hotels having garage accommodations for automobiles, and in this respect is ahead of any regular guide book published in English. Some of its large scale maps, too, are good. Indeed, it is a very useful book for the traveler by road in Italy.

The road signs of Italy are not what they are in France. They are neither so frequent, so conveniently placed, nor so well kept. They are often found wanting at some particularly puzzling crossroads.

The privately-placed road signs, those found here and there throughout Italy, erected by the Touring Club, are all sufficient and very readable, and in certain sections, as in Venetia, the local automobile clubs have rendered similar services. So far as they go the privately-erected road signs of Italy are distinctly good, but the government itself has been remiss.

There is nothing in the way of sign-posted information which gives the percentage of the rise on a hill, however, as in France, and the information to be acquired from local sources is often unreliable.

From Florence to Bologna, via La Futa Pass, is an easy enough hill-climb, if you don't stray from the main road; if you do you may strike a bit of 17 per cent. hill, or another of 25 per cent., for a kilometre or more, as the writer did. And at Florence, in the garages even, they will not tell you that there is an easier route via the aptly-named Montepiano, or via Pistoja and La Poretta. Either of these is a much better road than the main route over La Fute, which in spots rises and falls from 8 to 10 per cent. for a considerable distance, and the itinerary is hilly throughout. The distance by the direct road is in the neighborhood of a hundred kilometers, and by La Poretta perhaps twenty-five more.



Road building in Italy has not reached the height that it has in France. This seems mainly to be because of a lack of unity of purpose on the part of the various road-building authorities.

Throughout north Italy the "good roads" are as good as any "good roads" anywhere, and that's saying a good deal when one admits France into the

classification. But there are shockingly bad bits, even in the Italian lake district, near Lecco; on the great high road between Ferrara and Padua, just out of Ferrara, in fact; while the road from Spezzia to Pisa is unspeakable, to say nothing of being practically unridable.

The road surfaces in Italy in general are not nearly as good as they ought to be, and the upkeep is inefficiently performed.

Getting in and out of the small towns is not so bad, and the passing through the towns is often much more direct and simple than in France. With the largest cities, except in and out of Milan and Torino, the exits and entrances are awful, particularly at Genoa and Naples—and Spezzia, always Spezzia. Florence is bad enough, coming from the west or south, but the exits to the north are good. Most Italian cities and towns have a great encircling road, the Strada di Circonvallazione, which diverts a vast traffic from passing through the centre of the town. The Italians beat the world here. We must all take this leaf from out their road-making book.

The Minister of Public Works is responsible for the laying out, building, and repairing of the national, provincial, and communal Italian roads. The national roads, properly speaking, are those which connect the chief cities of the kingdom with each other and the seaports. The provincial roads connect the capitals of the different provinces, and the capital of a province with the county seats, and again link these cities and towns up with their nearest seaports. The communal roads are those running between the small cities or large towns. Below these ranks are other roads of merely local use and value.

The Italian classification of roads follows largely that of the French; perhaps it is their common origin in the Roman roads of old that accounts for this. The national and provincial roads of Italy have a width of eight to ten metres and the communal roads five to six metres.

Every automobilist in Italy should know something about the Roman roads of old, just in order to understand why the present lines of communication are laid down where they are, and why they often go straight up and over some Tuscan hill instead of going around.

"Those ancient roads,
Deserve they not regard! O'er whose broad flints
Such crowds have rolled,
So many pomps, so many wondering worlds."

Thus sang some poet of old, and with reason. What he did not take into consideration was their degeneracy to-day, their abrupt rises and falls in a hilly country, and their shockingly bad surfaces. The flints are not all broad on Italian roads, neither are the ruts.

The word *viae* with the Romans meant any sort of a road or highway, but more particularly was it adopted for historical references to those great lines of communication, surveyed, paved, and well cared for throughout all the régime of consuls and emperors. These Roman ways were above all strategic, as became the genius of the warring, conquering peoples.

The great Roman roads were marked with division stones or bornes every thousand paces, practically a kilometre and a half, a little more than our own mile. These mile-stones of Roman times, many of which are still above ground (milliarii lapides) were sometimes round and sometimes square and were entirely bare of capitals, being mere stone posts usually standing on a squared base of a somewhat larger area. A graven inscription bore, in Latin, the name of the consul or emperor under whom each stone was set up and a numerical indication as well.

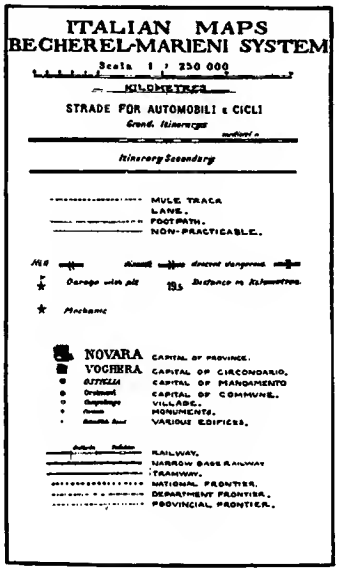
Caius Gracchus, away back in the second century before Christ, was the innovator of these aids to travel. The automobilist appreciates the development of this accessory next to good roads themselves, but if he stops to think a minute he will see that the old Roman was the innovator of many things which he fondly thinks are modern.

The greatest of all Roman roads was the Viae Appia, running from Rome to Capoul, the Appian Way of to-day over which automobiles, hunters and race horses fume and gallop in an effort to bury all thoughts of the past and keep up the pace of modernity. The young Roman of to-day is a very sporty individual, though he has got his ideas of sport from Anglo-Saxons. One fancies, when he comes to think of it, that the sportsman chariot-driver, runner, discus-thrower, or even gladiator of the old days was a good deal more thorough a sportsman nevertheless.

The desire for the quick transport of troops was the chief reason for the tracing and building of these famous Roman roadways, and the art sense was given full play at the same time, for these highways were refined and beautified by monumental and artistic bridges, arches and trophys. Even in Gaul these things were numerous, and to-day many of them are in an admirable state of preservation. Automobilists, coming to the French and Italian Rivieras, will recall this when rolling over the Viae Aurelicn, where, at Saint Chamas, is still the sublime Pont Flavian arching the roadway, as well as the Touloubre, or when viewing the old mile-stones at Salon and Saint Maxim and the now crumbled and desolate trophy at La Turbie.

At Rome, in the very geographical center of the empire, before the Basilica of Julia, was erected by the great Augustus a great *milliarium aureum*, a golden mile-stone—from which all the roads radiating from Rome took their departure. All along the length of the main roads were other mile-stones, many of them monumental and commemorative, and some even serving as roadside tombs of some good man or great.

Nine great roadways left this golden mile-stone leading to the ends of the kingdom. They were the Viae Appia, ending at Brindisi; Aurelia, traversing Etruria and Liguria and ending at Ailes in the Narbonnais; Claudia, which crossed Etruria; Flaminia, extending to Bologna; Lata, a subsidiary connecting roadway joining the Flaminia with the capital; Latina, a similar road, connecting with the Appia; Salaria, running east to the Adriatic; Trajana, also extending to the Adriatic; and finally Valaria, crossing the Sabine country.



Up to 312 B. C. these Roman roads were mere dirt roads, but when Appius Cladius set about to pave a Roman street he gave that impetus to road building which places the Romans firm in history as the first and greatest road engineers and builders.

This first road projected by Appius Cladius—an experiment it may be presumed—became the famous Appian Way leading to Capoul. Then came progress rapidly.

"GARDEN" IS TO BECOME A "CIRCUS MAXIMUS"

IT IS no easy task to supply a word picture of the plans of the decorative scheme of a big automobile show. Therefore, herewith is presented much of the material that comes from Press Agent Jervis concerning the "Ninth Annual Automobile Show" in Madison Square Garden, January 16 to 23, inclusive:

For many years Madison Square Garden may be said to have been to New York what the Circus Maximus was to ancient Rome. In the Garden the big shows, such as the "Wild West" and the circus with its chariot races, have held forth, similarly as the big races were held on the concourse of the Circus Maximus. Yet in all its history of varied service the Garden never has been treated by any showmen or decorators as if it were related to the famous Roman arena. The novel idea of doing this remained to be taken up by the promoters of the annual automobile show. The idea is now being carried out for the ninth national exhibition, to be held under the auspices of the Association of Licensed Automobile Manufacturers, January 16-23. The result will be an entirely new handling of the big ampitheater from a decorative viewpoint, simple and yet magnificent beyond all previous occasions.

In seeking to produce within the Garden a semblance of the Circus Maximus, the primary thought was to "open it up" and give the impression of spaciousness. All the signs and decorations of the main floor will be subordinated to this idea and kept lower than usual, so as not to interrupt the view from end to end.

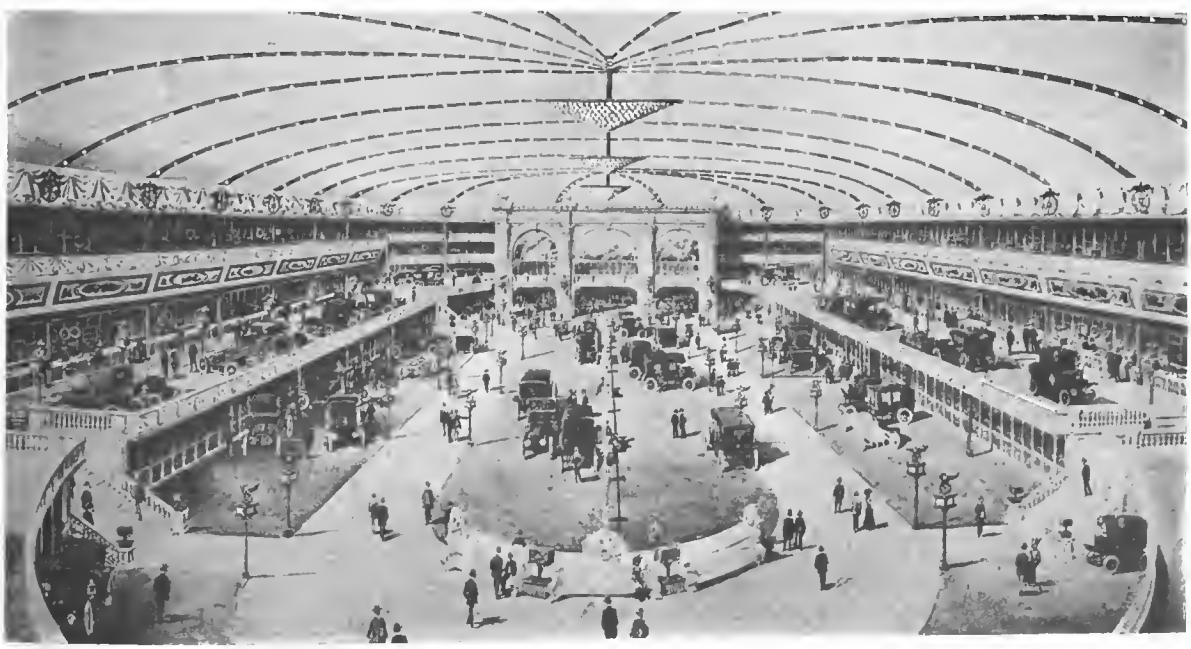
In working out this idea, W. W. Knowles, the architect, who conceived it, and who has done the designing for the whole show, has missed no point of which advantage might be taken. The layout of exhibitors' spaces, of the elevated platform, the galleries, railings, and other features, will be made to lend themselves to the idea, by being all in curved lines instead of angles. Most important in obtaining this effect is the building of the platform over the entrance, which for the first time will be in the shape of a half circle, so that from the entrance the mirrors will make it seem that one is standing within a complete ellipse and looking far away toward the other end of it.

The actual work on the decorating and the execution of Mr. Knowles' designs is in charge of S. R. Ball, who has done this work in former years. For the main floor the color scheme is brown and white and green, beneath a sky of azure blue. Immediately beneath the canopy of blue the girders of the Garden dome will glitter with myriad incandescent lamps, and a new feature of lighting will be found in twenty-five flaming arc lights, with colored shades, that will depend from the iron beams of the roof.

The floor beneath will be carpeted with green, where the exhibition spaces are, and bare boards will serve for aisles. In a row down the center and at all the spaces of the sides will be white lamp-posts that will inform visitors of the names of the exhibitors, and will be also guide-posts, directing them to the various departments of the show. Between the central row of posts will be tufted seats. Opposite the Madison avenue entrance will be a low electric fountain of gray stone, that will sweep in a curve about the foremost exhibits of the central space, the convex side being toward the entrance. In the basin of the fountain, beneath plashing sprays of water illuminated by parti-colored lights, goldfish will disport themselves, while real pond lilies ride upon the wavelets.

At the Fourth avenue end of the main floor will be the masterpiece of the whole great plan, the big triumphal arch, having three bays and extending from floor to roof.

The elevated platform will be supported from the main floor by white Doric pillars, and also the steps leading to the platform will be white. The walls back of the platform will be finished in panels of brown burlap, and in the beveled soffit, between the walls and the facing of the gallery, will be oval panels containing frescoes that depict the history of vehicular progress. These illustrative panels will be on both sides of the ampitheater and the pictures will tell the story of man's advance in personal transportation from his seat astride the little ass to his seat at the wheel of an aeroplane. Above these colorful panels will be the face of the gallery draped in white bunting; back of this the side wall will show in brown burlap and above between the sky line and the vertical decorations, will be an apron of white bunting, tufted and festooned, and pinned at places by the new show emblem of the A. L. A. M.



Main Floor of Madison Square Garden as Arranged for the A. L. A. M. Show, January 16-23.

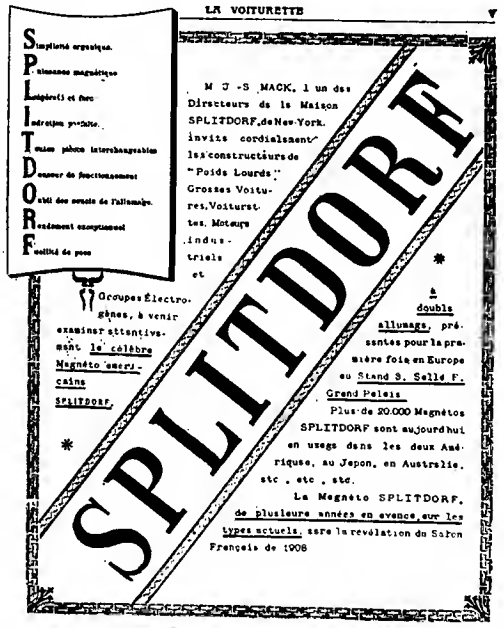
Even as the main floor, the different departments of the show in various parts of the Garden, will have a wholly new treatment. Nothing more novel ever has been introduced in decorations than the latticed arbor that will hood the concert hall with an arch 42 feet in span and 28 feet in height.

In the café, just off the foyer of the Madison avenue entrance, where are to be the electric vehicles, another strikingly novel scheme will be presented. Here the exhibits will appear beneath an Italian pergola, and as one looks over or between the cars he will get the impression of looking over a stone wall upon an Italian landscape.

In the basement, the white and brown color scheme will be maintained, and the rathskellar, which has been a feature for two years, will be more interesting than ever.

AMERICANS WHO WERE AT THE SALON.

PARIS, Dec. 17.—There was an exodus of American automobilists from Paris on the closing of the Salon at the end of last week. Among those who crossed the Atlantic to attend



First Indication of American Accessory Invasion.

the European shows and hurried home for Christmas were: Charles C. Clifton, of the George N. Pierce Company, Buffalo; David J. Post, of the Veeder Manufacturing Company, Hartford, Conn.; J. D. Maxwell, of the Maxwell-Briscoe Motor Company, Tarrytown, N. Y.; Mr. and Mrs. Emil Grossman, William Hyslop, automobile agent in Toronto, Can.; Russell Huff and H. D. Wilson, respectively chief engineer and European representative of the Packard Motor Car Company.

Mr. Wadsworth, of the Michigan Steel Boat Company, has gone South, and will sail from Naples on the *Caronia* December 22, in company with his wife and family. Another automobile passenger on the same boat will be Howard B. Coffin, of the Chalmers-Detroit company, who visited the London and Paris shows. Mr. King, formerly of the Northern company, who has been resting in Europe for several months, will stay here together with his wife until the spring.

John L. Poole, now European representative of the Buick company, and for several years chief selling agent in Europe of the Oldsmobile, soon intends to sail westward, severing all connections with the European market. After undergoing an operation at Chicago and resting for several weeks at French Lick or Hot Springs, Mr. Poole will take up an engagement in the States, the nature of which he is not yet ready to communicate.

Joseph Mack and Paul L. Snutzel, who have visited Europe on behalf of C. F. Splitdorf, will return home after making a tour of the Belgium factories, sailing from Antwerp on the *Zeeland* December 19. They will both return to Europe later in order to terminate arrangements for Splitdorf agencies in Europe. Mr. Mack declares that the results of the stand at the Paris Salon have exceeded all expectations; the Splitdorf coils and electric appliance have been well received by European constructors. The interest in the first American magneto to be placed on the European market is proved by the fact that arrangements have been made for the magneto to be tested on the cars of the following important manufacturers: Pipe, Gregoire, Bianchi, Pilain (of Lyons), Rollain-Pilain, La Buire, Delaunay-Belleville, Delahaye and Roy, of Bordeaux.

Charles C. Clifton declared that the most striking tendencies of the Paris Salon is toward the construction of small two and four-cylinder cars, rated at 8 to 12 horsepower in France, but which would pass for 15-20-horsepower models in America. "Practically every constructor of importance has produced such a model for the coming season, the supply apparently being so great that one may wonder if it will not exceed the demand. There is a lot of interesting matter tending toward the simplification of all mechanical organs; there are also plenty of new mechanical features well worth watching. A striking tendency is toward the adoption of dark colors for automobile bodies, this being so general at the present show that a light-colored car is a distinct novelty. It seems evident that there is a desire to avoid the necessity of frequent washing."

TO SHOW OR NOT TO SHOW, IS THE QUESTION.

PARIS, Dec. 15.—It is now for the Automobile Club of France to decided whether there shall be a salon in 1909. Recently a deputation of nine of the leading constructors, representing Renault, Dietrich, Panhard, Delaunay-Belleville, Brasier, Motobloc, Gobron and Bayard-Clement, waited on Gustave Rives, organizer of the salon, and informed him that a large number of important firms had decided to take no part in any show next year, and requesting that no salon be held until 1910.

The only reply that could be given by Gustave Rives was that he would communicate the wishes of the deputation to the Automobile Club of France, who would consider the matter and give a decision at an early date. The chief mover in the Paris shows took the opportunity of pointing out that even if the Paris Salon were abandoned, it was not likely that London would consent to cast off its annual exhibition, thus it would still be necessary to create new models every year whether they could be exposed at Paris or not.

Small car builders have also met to consider which party they shall support, but were unable to come to a decision. The accessory men are strongly in favor of a show, while aeroplane constructors believe that a salon every year would be a valuable means of developing their branch of the industry.

NEWARK WILL HAVE ANOTHER SHOW.

NEWARK, N. J., Dec. 21.—Newark will hold an automobile show from February 20 to 27. The State Military Board has granted the use of the new Essex Troop Armory, in Roseville avenue, to the New Jersey Automobile Trade Association, which organization will conduct the affair, which will also be held under the auspices of the First Troop, N. G. N. J.

H. A. Bonnell, of East Orange, treasurer of the American Automobile Association, has been selected to manage the show. Mr. Bonnell was formerly secretary of the New Jersey Automobile and Motor Club, which position he relinquished last year to become secretary-treasurer of the Associated Automobile Clubs of New Jersey.

Farman Trying Out His New Aeroplane over the Plain at Châlons.

PARIS, Dec. 17.—James Gordon Bennett has offered a cup valued at $2,500, which will doubtless take the same position in the flying-machine world as was held by the Bennett trophy in the realm of the automobile. In addition to the cup, to be competed for annually, there are three prizes of $5,000 each to be paid out in cash to the winners of the trophy in 1909, 1910 and 1911. The trophy has been placed in the hands of the Aero Club of France and must be put up for competition by them under regulations to be drawn up by the International Aeronautical Federation.

The scene of the first race will be in France, the succeeding races to be held in the country of the club winning the trophy, as was done for the Bennett automobile cup.

The first race will be held over a distance yet to be decided upon, either in a straight line, in a broken line or over a closed circuit, the winner being the one who completes the course, or in case several complete it, the one making the fastest time. General regulations for the race must be decided each year before the end of January by the International Federation, engagements being received until March 1, and the race run between May 1 and November 15. Each federation or club has the right to enter not more than three competitors for the Bennett race, with the same number of reserve men, the competitors and reserve aeronauts being of the nationality of the club.

Club Accepts President Roosevelt's Offer.

NEW YORK CITY, Dec. 22.—At a meeting of the medal committee of the Aero Club of America President Roosevelt's offer to present the gold medals awarded by the club to the Wright brothers, in the East Room of the White House, was formally accepted. The club originally invited the President to make the presentation in New York, which was declined and the above offer made. It is anticipated that the presentation will take place some time during the week of January 23.

The committee has selected the design submitted by Victor D. Brenner from the numerous sketches made by various artists. The obverse will bear a portrait of the Wright brothers, while the reverse will show an accurate representation of the Wright aeroplane in full flight, in addition to the seal of the club. The medals will be three inches in diameter and of gold, though a number of replicas in silver and bronze will also be struck off. The cost is estimated at $2,000, of which over $1,200 has already been raised. At the request of the medal committee, Congressman Herbert Parsons, who is a member of the club, will introduce a bill into Congress asking that official cognizance be taken of the achievements of the Wright brothers by presenting them with a special Government medal in appreciation of the fact that they have placed America in the front rank in the science of aviation.

The annual dinner of the Aero Club will be held in New York shortly after the presentation of medals at Washington.

Wright's New Records.

LE MANS, Dec. 18.—By remaining up for a greater length of time than has yet been possible to any other aviator, by flying a greater distance than had previously been covered, and by ascending to a height not hitherto attained by a heavier than air machine, Wilbur Wright again demonstrated his complete mastery of the air to-day. The first trial was undertaken at 10:12 A. M. and was an official attempt at the Michelin prize for distance. This is a cup offered by M. Michelin for the greatest distance made by an aeroplane during 1908. Mr. Wright continued to circle the aerodrome until 12:05, during which time he went round the Auvours circuit 45 times. According to an official of the Aero Club who was present, this was the equivalent of 90 kilometers, but as Mr. Wright circled the posts wide at each turn, the actual distance covered is said to have exceeded 120 kilometers, or about 72 miles.

During the afternoon Mr. Wright competed for the height prize offered by the Aero Club de la Sarthe, and in less than ten minutes after leaving the ground demonstrated conclusively that the limitation of 328 feet imposed by the captive balloon anchored on the circuit for the purpose was a mere nothing. After circling around several times he sent his machine well above the balloon, at a height estimated at 360 feet.

F. S. Lahm Seeks Aeroplane Capital.

NEW YORK CITY, Dec. 21.—On the French liner *La Provence*, arriving here yesterday, were Frank S. Lahm, father of Lieutenant Lahm, now at Fort Myer, Va., in charge of the Government aeroplane tests, and Cortland Field Bishop, president of the Aero Club of America. Mr. Lahm has been a resident of Paris off and on for the past 30 years, but he is an enthusiastic American and a strong believer in the fact that the Wright brothers' methods of aviation will eventually be adopted universally, either commercially or for purposes of warfare.

Speaking of his experience in flying with Mr. Wright, Mr. Lahm said that it was a bit exciting at first, but taken all in all was a most delightful sensation. "It was as if we were on a steamer in a calm sea with a gale of wind driving past us," he continued, "or sitting in a chair exposed to a strong breeze. Had I not seen Mr. Wright alight a great many times, our sudden drop would have been unnerving, as we came down at the rate of a mile a minute in big spirals, until when near the ground the machine was manipulated so that it came to earth without a jar. I expect to see a Wright machine make a flight across the English Channel and back before next spring."

Cortland Field Bishop said that the Wright brothers had become the idols of all France, and that Orville Wright's intention was to establish a school at Pau, upon his return to Europe. "I am informed that the Wright brothers will begin the manufacture of aeroplanes on a large scale," said Mr. Bishop, "the best ones costing about $5,000, with small ones as low as $1,000.

HOW THE A. C. F. IS KILLING ITS GRAND PRIX

PARIS, Dec. 17.—Engagements are open for the French Grand Prix, to be run on the Anjou course in "Chateauland," July 2, 3 or 4. For $1,000 a single car not exceeding 130 millimeters bore can be entered; for two racers the price is $1,800, while for a full team of three the sum of $2,400 must be paid over to the Sporting Commission of the Automobile Club of France. But if automobile constructors want to race over the smooth roads in the neighborhood of Angers they must pay down their cash with unusual promptitude, for the Racing Board has taken the decision to abandon the Grand Prix unless forty entries are received at 6 p. m. on Thursday, December 31. In other words, the Sporting Commission of the Automobile Club of France has decided to kill its own race. Lacking sufficient courage to put it out of existence with an honest blow, they have imposed such conditions that there is nothing to be done but accept the Grand Prix as dead and awaiting a formal interment.

Seventeen European firms, comprising Benz, Brazier, Bayard-Clement, Dietrich, Germain, Mercedes, Motobloc, Panhard, Renault, Berliet, Deon Bollee, Darracq, Delaunay-Belleville, Isotta-Fraschini, Minerva, Peugeot and Pipe, have signed an agreement not to take part in any race in 1909, and further, to do everything in their power to prevent outsiders using their cars for racing purposes. Breakage of the engagement will incur a penalty of $20,000.

The result of this agreement is that the possible number of starters in the next Grand Prix is reduced by twenty-four. In 1906 there were 32 cars in the French Grand Prix; in 1907 the number was 37; this year there were 48 starters at Dieppe. Deduct 24 from the highest of these figures and we are still far from the 40 which the club must have for its annual race.

Officially the reason for this minimum is that the race cannot be made to pay with a smaller number of cars. One does not need to be a mathematician, however, to figure out that since the 1908 Grand Prix realized a profit of about $30,000 with 48 starters, and that the 1907 race gave a credit balance of about $10,000 with only 37 cars, it is possible to hold the race with even 30 cars or less and still have a balance on the right side. Another reason for putting this ban on racing is that long distance speed contests are too costly for the manufacturer. No one denies the truth of the statement, but with the profits already in hand and obtained each year the objection could easily be removed if there was any desire to do so.

The truth of the matter is that the big French manufacturers have got cold feet. Dieppe disheartened them; Bologna discouraged them still further; Savannah had no influence whatever, for there was not a manufacturer in France or an engineer acquainted with the cars who had the least hope of seeing a French machine carry off the trophy.

But for outside pressure and liberal help from the tire firms not a single French car would have been sent across the Atlantic.

For the present entries are open, and indeed three have already been received by the secretary of the racing board, the firm being Cottin-Desgeuttes, of Lyons, and the cars four-cylinder models of 130 millimeters bore and 200 millimeters stroke. A small group within the club and a still larger group without have hopes that the forty cars may be found in the twenty-one days allowed, thus forcing the club to organize the race it has promised but has done its best to kill. Of those taking part in last year's race Mors, Itala, Fiat and Opel have refused to sign the anti-racing agreement, and might all be induced to take part in the 1909 event. Add to these three cars from America, six from England, six from the smaller Italian firms which took part in the 130 millimeter Italian race of this year, nine from the smaller French firms not previously taking part in big races, and the figures would be so near the limit that somebody would be induced to complete the number. It is indeed declared that should the entries be only two or three short of the necessary number De Dion would come forth and fill the breach. The Marquis de Dion has been one of the stoutest opponents of racing, but is now of the opinion that, in view of the engagements taken and the promises made, the club cannot abandon its Grand Prix without losing all prestige.

STRUGGLING WITH BRIARCLIFF TROPHY RULES

SUPPLYING satisfactory rules for a stock chassis race is a task that requires patience, ingenuity, and a conclusion in advance that the regulations will not be acceptable to all those who might care to participate. After the so-called "Committee of Automobile Manufacturers" had announced the rules drawn up last week, there was immediate objection from several quarters, protesting against a maximum bore of 5¼ inches, minimum weight of 2,600 pounds, and minimum wheel base of 110 inches. It was immediately shown that these conditions made the event a high speed race and would compel concerns which had competed in the 1908 event to build special racing cars for the 1909 contest. So pronounced were the objections that the committee met again on Tuesday last at the clubhouse of the Automobile Club of America and continued in session the whole afternoon.

The final outcome was the announcement of new conditions providing for a maximum bore of 4⅝ inches and a maximum stroke of 6 inches for a four-cylinder engine, or, in other words, a total piston displacement of 403 1-5 cubic inches. The revised wheelbase minimum calls for 118 inches and the minimum weight is reduced to 2,300 pounds. Furthermore, the committee decided to ask the donor of the trophy, Walter W. Law, to agree to the changing of the conditions requiring that "the manufacturer of a car entered in the race shall have sold and delivered or have built and have had ready for delivery at least thirty days before the date of the contest in the year 1909 at least ten cars similar in each and every respect to the car offered for entry."

It is predicted that Mr. Law, who is now en route home from Europe, will not agree to change the character of the race.

After the meeting the first entry was filed, it being that of Paul LaCroix, who nominated a Renault.

While in Kokomo the other day, John C. Wetmore interviewed Apperson Bros., who are quoted as follows:

"We do not believe that a satisfactory stock car definition can be evolved. Henry Ford, H. O. Smith, Walter Marmon, A. C. Newby, George A. Weidley and one of us spent ten days in trying to evolve a stock car definition for the A. A. A., and I don't think we succeeded very well. If we are to have races let us set a cylinder and a weight limit, and then let each maker build around them the best cars he can. These limitations, however, should be limitations suitable for the engines that are to be included in our regular stock cars. In a word, we should demonstrate in the big races the capability of the actual engine used in our stock cars. What bodies or running gear are used it is really immaterial, provided the outfit be within the weight limit. We favor engine and weight limitations for each class of standard car in, say, four distinct classes. For instance, class A might be 5½ by 5, class B, 4½ by 5, and so on down the line. The public, we repeat, wants a stock-car engine demonstration and not an exhibition of speed attained by engines not appearing in regular stock models."

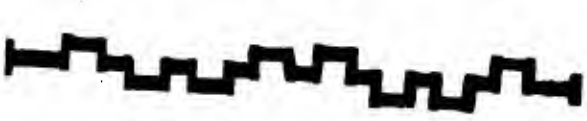
AUTOMOBILE MOTOR CRANKSHAFTS DISCUSSED

By THOS. J. FAY, President Society of Automobile Engineers.

As a measure of the utility of steel, it is possible to devise a formula such as will serve to forecast (in a modest way) the probabilities. Such a forecast might be set down as follows:

$$U = \frac{\text{Tensile Strength} + \text{Elastic Limit} \times \text{Elongation}}{10^5} = \text{Utility.}$$

It is, of course, necessary to make all comparisons using test specimens of exactly the same dimensions in every case. The



An Eight-Cylinder Proposition in One Piece.

author prefers to use the "International Standard," the main dimensions of which may be set down as follows:

Between enlargements = 2 inches

Diameter enlargements = 1-2 inch

To show the working of the method, it will be the idea to establish the U value of the chrome nickel steel previously taken for comparison, thus:

$$U = \frac{150{,}000 + 130{,}000 \times 12}{10^5} = 33.6$$

A very low value, due to heat treatment of the steel.

It is not the purpose here to set down in black and white the unqualified statement that high elongation is an absolute sign of kinetic ability irrespective of any other consideration. It is fair to say that the absence of this property is in the absence of kinetic ability.

Looking at the matter from another angle it is to say,

$$\frac{\text{Elastic Limit}}{\text{Elongation}} = \text{the lowest possible value in the best possible steel.}$$

For the steel just taken this value would be as follows:

$$\frac{130{,}000}{12} = 10{,}833$$ which is a rather high value for the class of steel represented, but the same class of steel is prone to go wrong in this direction; 5,000 would be a good value.

Take "carbon steel" and fix upon its "utility" factor "U" under changing conditions of the carbon content. To begin with, it will be necessary to fix upon the physical properties under the several conditions of the carbon content, which will be as follows:

PROPERTIES OF ACID OPENHEARTH STEEL.

Points Carbon.	Tensile Strength.	Elastic Limit.	Elongation % in 2 Inches.	Utility Rating.
10	55,000	28,000	30	24.9
20	65,000	32,000	26	25.3
30	75,000	37,500	22	24.75
40	85,000	42,500	19	24.22
50	95,000	47,500	17	24.22

The figures taken were picked more or less at random from tests of carbon steel, which, however, does not debar their use for the intended illustration. What we find is that according to the method employed the value "U" is not changed (substantially) by changing the carbon content. Of course, by treatment the values are lowered when desired, but it can be shown that the "U" value will be nearly the same, irrespective of the changes, so long as the steel is not alloyed.

A genera of steel, then, has its own utility value, and if a greater value is desired it is necessary to alter the chemical composition of the product. It will be possible to say that there are any number of cases in which the tests would show a substantial departure from the values as here given. This fact does not make the method wrong; indeed, it would show that some of the steel might be below the quality possible of attainment in good practice, or it might show an occasional test of steel better than can be expected in the general run of things.

In further proof of the accuracy of the scheme it is only necessary to compare the results attained by the usual manipulation of a given specimen of steel, such as the following:

The tests of a specimen of 44 points carbon steel show results as follows and the "U" values as calculated by the author show substantially constant for all, no matter what the treatment:

STEEL IN THE NORMAL STATE.

Tensile strength in pounds per square inch	92,000
Elastic limit in pounds per square inch	36,000
Elongation	19%
Utility value	24.32

WATER QUENCHED AT 850 C. AND ANNEALED AT 550 C.

Tensile strength in pounds per square inch	156,000
Elastic limit in pounds per square inch	92,700
Elongation	10%
Utility value	24.87

OIL QUENCHED AT 850 C. AND ANNEALED AT 550 C.

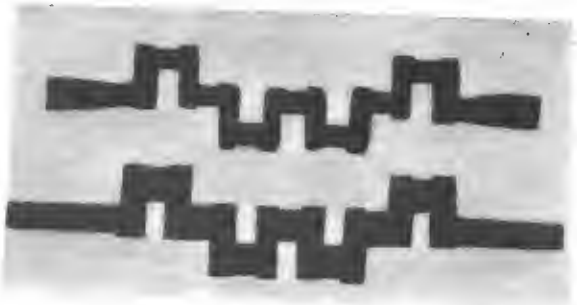
Tensile strength in pounds per square inch	126,000
Elastic limit in pounds per square inch	70,000
Elongation	13%
Utility value	25.48

It will be observed that this utility rating, or value, as it is termed for want of a better name, hangs to the carbon steel with great tenacity at or near $U = 24$. It is true, however, that very low and very high carbon contents are prone to influence the results.

There is one other point of moment to take into account, *i.e.*, each genera of steel has its own figure of merit, such as ought to be reached, else it would be possible to say of the steel, it is not up to the customary standard of merit. These values can be set down about as follows:

(1) Swedish iron 34
(2) Carbon steel 24
(3) Nickel steel 34
(4) Vanadium chrome steel 44
(5) Chrome nickel steel 54
(6) Special alloy steel 64

(1) Swedish iron and some brands of English iron as "Farnley" are possessed of a higher "U" rating than any of



Showing Die Forging of Chrome Nickel Steel.

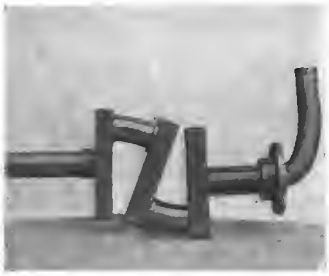
the grades of carbon steel. It is on this account, perhaps, that Lemoine and others were wont to use iron in automobile construction, be it said to their credit, with more than a little success.

(2) So variable in its character as not to lend confidence, either in the matter of fixing a rating or in the use of the steel, due entirely to the presence of carbon.

(3) A very stable rating in the grades of nickel steel holding a low carbon content, that is to say, with carbon below 16 points.

(4) Subject to considerable variation, especially if the carbon is somewhat high, or, in treated products.

(5) The author never found more than one grade of alloy steel in which the "U" rating reached the high value here given.



Double Opposed Krupp Steel Shaft after Test.

(6) The carbon content does not alter the rating materially, even considering wide variations of the same. Heat treating does not increase this rating over and above what it should be in well-fabricated normal steel. Heat treating, however, will readily decrease the rating. This will be possible for several reasons, as, overheating, heating at too great a rate, or quenching under mal conditions. If the material is not what it is supposed to be and the treatment is not therefore in accord with the requirements in view of the composition of the steel in fact, then it is assured that the rating, so called, will be altered. On the whole, however, it is to say, the rating will hold to a fairly constant value for any given genera of steel.

Without further reasoning we can reach these conclusions:

CRANKSHAFT STEEL.

(*a*) Should have a low carbon content.
(*b*) The tensile strength should be high.
(*c*) The elongation should be high.
(*d*) The "U" rating should be high.
(*e*) The unit stresses should be low, very low indeed.
(*f*) The elastic limit might be low without detriment if kinetic ability may not be reduced thereby.
(*g*) The steel should be well fabricated.
(*h*) The low carbon would indicate higher manganese and some alloying.

The general inference is that the tensile strength should be high and that the initial rigidity will be a maximum. The elongation should be high since kinetic ability might then reside in the steel. The elastic limit is not so important provided the unit stresses are established by designing at a very low point. Low carbon indicates ability to manipulate the steel without danger of destroying the good qualities of the same.

HEAT TREATMENT.

The desired heat treatment is that which will increase tensile strength and elongation at the expense of elastic limit in such a way as to improve kinetic ability, referring, of course, to crankshaft work. The following table shows that it is possible to do so:

SOME RESULTS OF HEAT TREATMENT.

Condition.	T. S.	E. L.	Ex.	Identification.
Normal.....	65,000	29,100	27.2	Manipulation of carbon steel in which the carbon content was 16 points, as reported by "Brinell."
Annealed.....	67,000	40,000	30.9	
Treated.....	78,800	30,900	22.1	
Treated.....	71,900	25,300	27.8	

An inspection of the test shows that the tensile strength can be increased at the expense of the elastic limit without affecting the elongation. The test also shows that the "U" value will not be diminished in the process below the customary point. The difference as between oil and water quenching, with subsequent reheating, was well illustrated in this case. Alloy steel if treated at the temperatures suitable for its qualities would be quite as or even more susceptible. Finally, it may not be too much to say the whole discussion rather goes to show that it is the mal use of steel that ends in disrupted crankshafts rather than a question of the materials to use. It is a fact, nevertheless, that very effective results might follow were the steel somewhat especially fabricated for the work, although it does not follow that the best steel for the purpose will necessarily have to be the hardest and the strongest steel.

There is one other point that can well be mentioned at this time. The advantages of heat-treating will be influenced by the shape and the manner in which the steel is handled. If the forgings are bruised in the process it will be quite out of the question to realize any very noteworthy results, no matter what the process may be. Then, again, there is the question of the shaping of the cheeks, that is to say, the manner in which the contour is effected. If crankshafts are cut from the solid they may be good, or bad, depending upon the question of the relation of the grain to the contour, if there is any indication of fiber in the structure of the steel. In a dozen different ways the treatment may be effected, as, for illustration, twisting the crankshaft to locate the cranks in the desired angle will surely effect the results, if the material is not of the kind to stand the twisting; moreover, very few are the grades of steel that will stand this twisting and not deteriorate in the process. On the other hand, if the steel is of the right grade, the tensility, hence the rigidity, will be increased by the twisting. If rigidity is wanted, this is one way to realize the same.

Relation of the Bearings to Material of the Crankshaft.

Discussion in relation to the question of the relative value of "plain" and ball or roller bearings is a matter that cannot well be advanced to any definite conclusion without considering the materials used in the crankshafts. In a word, if plain bearings are to be used the material of the crankshaft will have to be of the kind or in the condition such as will allow of the use of plain bearings. It is probably well understood that there is a great difference in the performance as between steel in the normal state and the same steel in some one of the several conditions in which it can reside. Pearlitic steel (steel in the pearlite state) is generally regarded as a poor material for use in bearings. All untreated steel, if the carbon content is below 90 points, is of the pearlitic genera and is not the best for bearing work. True, there is a considerable difference as between the various brands of pearlitic steel. For instance, a well-fabricated steel will serve better for a bearing than will the same steel not well fabricated.

Wootsite, or steel in the Marientistic state, may be far better for bearings of the plain type, but it must be remembered that these conditions are the product of a special heat treatment. This special heat treatment is not always afforded, and it is not always a fact that the crankshafts are in the best possible state. With ball or roller bearings these are not matters of moment since the "journal" portions of the crankshafts do not have to do bearing work. In other words, where the materials have to do special bearing duties they are heat treated to bring about the desired condition. If it is true that in ball bearings the steel has to be rendered as Wootsite to afford the desired results, then it is equally true that plain bearings should be rendered suitable. It is not the purpose here to maintain that any one of the intermediate conditions will best serve the purpose more than to say that for the best results in bearings the steel has to be heat treated, which involves a quench from some high temperature and subsequently the steel has to be "let down." It is some intermediate condition due to "letting down" or tempering that is sought in order that the steel will be in the

Balanced Four-Cylinder Crankshaft of Alloy

best possible condition to do bearing work. As before intimated, in ball or roller bearings this matter is attended to since they are heat treated and in them the material resides in the best state for bearing work.

Material in Crankshaft Should Be in a Different State.

These are all matters besides the question of the strength of the crankshaft and they are of even greater importance since a crankshaft is of no value at all if the bearings fail to work in a satisfactory manner. It is not uncommon to hear the statement made that the "Babbitt" lining in the bearing proper is of some wonderful grade that assures entire freedom from bearing troubles of every kind. There is nothing in such a statement unless the materials of the crankshaft (journals) are also suited to the purpose. Of course, it would be an unjustifiable expense to use such fine materials as go into ball bearings (of the grade that are used in crankshafts) for crankshafts and, again, such materials are not so good for the purpose under the conditions in which a crankshaft has to work as they are in ball-bearing work. It follows that the best combination is one involving the materials for crankshafts of a highly kinetic character and of great rigidity in combination with materials of the highest bearing qualities in the ball or roller bearings, the later from the bearing point of view only.

It is a well-known fact that materials for ball or roller bearings are not suitable for crankshaft work. It is equally well known that the ball or roller bearings are made of the best materials for the purpose. How, then, can the best possible results be realized without actually resorting to the use of the special bearings; that is to say, the ball or roller bearings. Without stating definitely the composition of materials for ball bearings, it is fair to say they take into account the carbon content at a point bordering upon free "cementite" with the steel in the normal state. Free cementite presupposes carbon above 90 points, and in such steel it is out of the question to consider the same as suitable for use in what are known as "machine members," in which the dynamic conditions are such as to include bending, sheering, and torsional moments. Statically, this material will serve very nicely, or, if the moments are as in a ball bearing, the results are very fine, as has been proved in practice.

Reducing the carbon reduces the ability of the balls and the races, and as a result it is plain that the materials that serve best for ball, and, roller bearings, are the least suited for crankshafts. Logically, then, the ball bearing crankshaft is something to take into account. The reason for this should be quite clear, since it enables the designer to use,

(a) Crankshaft materials of a highly kinetic character that is easy to work.

(b) Ball-bearing materials exactly suited to the work.

INTIMACY OF THE RELATION OF TORQUE TO SPEED

CURIOUS as it may seem, it is not uncommon to hear autoists talk about the torque of their motors on a basis of the pressure that is due to "cold compression," not taking into account that the compression, in fact (under running conditions), is entirely at variance with the cold compression. The difference is generally considerable, and, unfortunately, the compression falls away as the speed of a motor is increased. In a general way, it will be possible to look at this important matter in the manner as follows:

Let

$H.P.$ = the actual horsepower of the motor;
S = the angular velocity of the crankshaft, in r.p.m.;
P = pull in pounds;
R = radius of the lever-arm in feet;
π = the ration of diameter to circumference;

then,
$$P = \frac{H.P. \times 33{,}000}{2\pi R S} \qquad (1)$$

and,
$$S = \frac{H.P. \times 33{,}000}{2\pi R P} \qquad (2)$$

$$H.P. = \frac{2\pi R S P}{33{,}000} \qquad (3)$$

$$\pi = \frac{22}{7} \text{ nearly}; \quad = 3.1416, \text{ nearly} \qquad (4)$$

$$R = \frac{H.P. \times 33{,}000}{2\pi S P} \qquad (5)$$

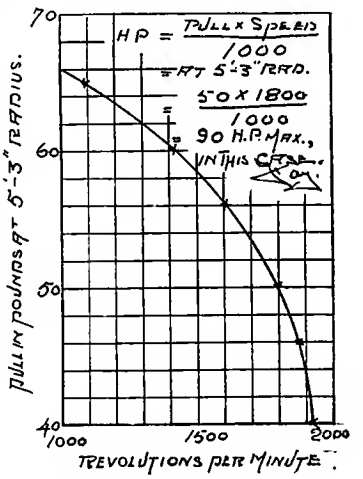
Considering a "prony" brake for testing purposes, if the arm of the same is 5 feet 3 inches long (balanced), it is then possible to simplify the formula (3) in a manner as follows:

$$H.P. = \frac{P S}{1{,}000} \qquad (6)$$

The curve as here given is of a test using a brake (compensating) of the description in which the lever-arm was of the length as stated. An inspection of the curve will disclose not only the shape of the curve of torque, but the point at which the motor (in this case) delivered its maximum power. The best way, perhaps, to make the matter show up to excellent advantage, will be to give a tabulation of the results as follows:

(a) $1{,}000 \times 66 = 66{,}000 \div 1{,}000 = 66$ horsepower.
(b) $1{,}500 \times 58.5 = 87{,}750 \div 1.000 = 87.75$ horsepower.
(c) $1{,}800 \times 50 = 90{,}000 \div 1{,}000 = 90$ horsepower.

In the actual test of this motor it was a fact that the motor did deliver slightly more power than the value given in the line (c) at a speed somewhat above 1,800 r.p.m., but it is also true of this motor that at 1,900 r.p.m. the power fell away, showing that the limit of useful speed was reached. As will be seen, the power increased steadily, between 1,000 and 1,900 r.p.m., although it is also true that the torque decreased during all that period. On the other hand, the torque did not decrease in the same ratio as the speed increased, hence the increase in power.



Relation of Torque to Speed in a Motor.

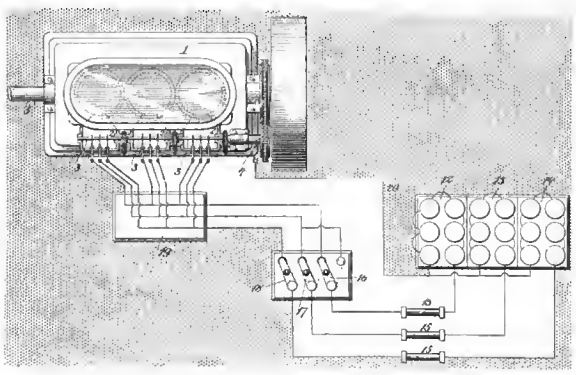
The relation of torque to speed is desirable just so long as the speed will increase at a greater rate than the torque will decrease. So long as this state of affairs can be maintained, just so long will the power continue to increase, thus increasing the "weight efficiency," which is the matter of great moment in work involving the automobile. Under such conditions it is only necessary to take into account the question of the stability of the motor, assuming a fair first cost, in dollars per horsepower rating, and not in dollars per pound of motor. When a motor delivers so much power that it depreciates too rapidly, then it is equal to saying that the weight efficiency is excessive. This condition can be due to bad material or inferior design in motors involving a good relation of torque to speed.

DUAL IGNITION PATENTS CLAIMED BY APPERSON

ETERNALLY events repeat, and it is now claimed that the patent situation will take on exciting phases due to the presence of another "basic patent," or a patent with such broad claims as to give to the owners a monopoly in so far as dual ignition systems are concerned in conjunction with internal combustion motors such as are used in automobile work.

Elmer Apperson, of Apperson Bros.' Automobile Company, Kokomo, Ind., partially by acquiring the patent issued to F. E. Canda, January 17, 1899, and by taking out another patent in his own name, has built up what is claimed to be a strong situation. The Canda patent is No. 617,806, and the Apperson patent is No. 905,625, which later patent was issued December 1 this year. These patents, as the further information here given will show, relate to dual ignition systems as are in use on nearly every automobile on the market at the present time employing the double system.

To what extent this situation will complicate matters is a question that the future will have to decide, and as to the merits of the patents enough it is to say that they hold until



Plan of Canda Patent Electric Ignition System.

they are upset by a court of competent jurisdiction, and not before. In the meantime, it is not too much to anticipate that the present owners of the patents will endeavor to realize upon their holdings. With a view to showing, in the most accurate manner possible, just what these patents amount to, the preamble and the claims of each will be given in full. Since the Canda patent was issued first, it will be first exposed to view, as follows:

Preamble of the "Canda" Patent.

My invention relates to improvements in gas and oil engines, and particularly to improvements in electric igniting and speed-regulating mechanism for such engines.

My invention consists in employing a plurality of igniting devices for each engine cylinder and operating, by preference, a plurality of such igniting devices during each working stroke of the cylinder, so as to insure the production of a spark by some one of the igniting devices during each working stroke; in providing separate circuits and batteries for the separate igniting devices of each engine cylinder and switches by which one or more of the batteries may be disconnected or connected with a different set of igniting devices from that to which it is ordinarily connected, thus making it possible to locate or bridge over any defect in the operation of the igniting mechanism which may occur during the operation of the engine; in so arranging the several igniting devices of each engine cylinder that ignition may be produced at different periods in the stroke, thus making it possible by throwing one or more of the igniting devices of each engine cylinder out of circuit to vary the speed of the engine, and in the novel combination, construction and arrangement of the parts.

The objects of my invention are, first, to provide an igniting mechanism which shall more certainly ignite the explosive charges of oil and gas engines than the igniting devices heretofore in use; second, to provide means for locating defects in the operation of the igniting mechanism and for bridging over such defects without interfering with the operation of the engine; third, to provide simple means for varying the speed of the engine which may be operated at a distance from the engine.

In the drawings the invention is shown as applied to a three-cylinder vertical engine, but it may be applied to any single or multiple cylinder gas or oil engine of any type, and the particular igniting mechanism employed comprises a series of sparking contact-points, with means for bringing them together and separating them at proper intervals, and suitable circuits and electrical generators therefor.

In former gas or oil engines having electrical igniting devices trouble has been experienced through the occasional failure of the igniting device to cause ignition at the proper times. Entire failure of the igniting device to cause ignition continued for several successive strokes necessarily stops the engine, and the occasional failure of the igniting device to cause ignition at the beginning of a working stroke or ignition at too late a period in the stroke interferes greatly with the efficiency of operation of the engine and causes undesirable fluctuation in speed. As electrical igniting devices have been constructed heretofore it has been difficult to locate any defect in the operation of the igniting device or to bridge over the defect without stopping the engine or otherwise interfering with its operation. I have found that by employing a number of separate igniting devices for each engine cylinder the effectiveness of the whole igniting mechanism is very much increased.

Considering the fact that any patent is as broad as its claims, it will be necessary to examine the claims of the "Canda" patent in order to ascertain the scope of the same. The Canda claims were stated in the grant of the patent as follows:

Claims of the "Canda" Patent.

1. An igniting mechanism for the working cylinders of gas and oil engines, comprising a plurality of separate electrical igniting devices having separate circuits, means for supplying current thereto and means for throwing said igniting devices into and out of action, and for throwing each into action independently of the others, substantially as described.

2. An igniting mechanism for the working cylinders of gas and oil engines, comprising a plurality of separate electrical igniting devices having separate circuits, means for supplying current thereto, and switches in said circuits for throwing each igniting device into and out of action independently of the others, substantially as described.

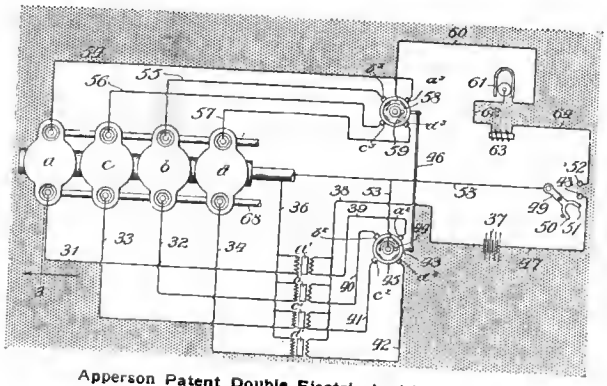
3. An igniting mechanism for the working cylinders of gas and oil engines, comprising a plurality of separate electrical igniting devices having separate circuits and separate electrical generators, and switches in said circuits adapted to throw each igniting device into and out of circuit with its own generator and also into and out of circuit with the generator of a different igniting device, substantially as described.

4. A speed-regulating mechanism for gas and oil engines, comprising a plurality of separate electrical igniting devices, adapted to ignite the charges at different periods in the stroke, and means for throwing the several igniting devices into and out of action, at will, substantially as described.

5. In an internal-combustion engine, the combination with an engine cylinder, of a plurality of separate electrical igniting devices for said cylinder, set to ignite the charges at different periods in the stroke, and having separate circuits and separate electrical generators, and switches in said circuits adapted to throw each igniting device into and out of circuit with its own generator, and also into and out of circuit with a generator of a different igniting device, substantially as described.

6. In an electrical igniting mechanism for gas and oil engines, the combination, with a camshaft within the engine cylinder, a series of cams thereon and staggered with reference to each other, and means for rotating said shaft, of a series of movable pins opposite said cams, means for pressing said pins toward and against said cams, and means for limiting the motion of the pins, said pins being insulated from the cams except at the points of contact, substantially as described.

The Canda patent, in itself, does not seem to be all that would be required in order to establish the monopoly such as any "inventor" is entitled to if his invention is such as to breed an exclusive right. It will be necessary, then, to examine the Apperson patent in order to find the broad ground on



Apperson Patent Double Electric Ignition System.

which to establish the claims that are now being made by the present owner of the two patents. The declaration of the Apperson patent is as follows:

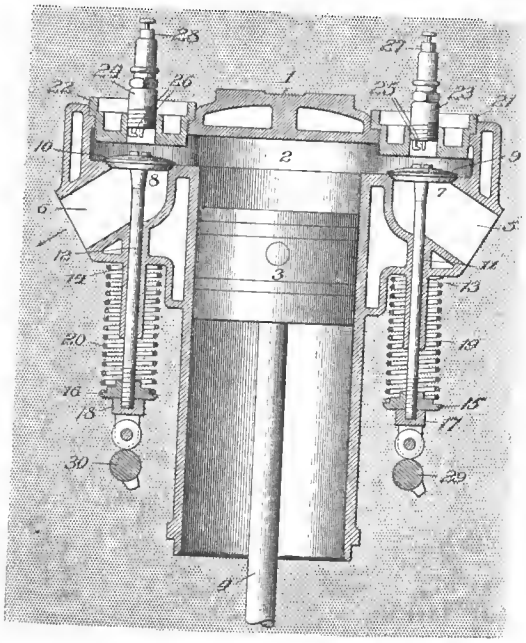
Preamble of the "Apperson" Patent.

My invention relates to explosion engines of the type used in automobiles, and has as an object the provision of means for overcoming the necessity of removing the ignition plugs from the cylinders to clean the contacts carried thereon when they become covered with oil, soot or other undesirable dsposit.

It has heretofore been the practice to supply the cylinders of engines of ths above type with one ignition plug, and it has been necessary to remove this plug and wipe or scrape the contacts carried thereon in order to clean them. In my present invention I provide two such plugs entering the explosion cavity of the cylinder at different points. I also provide two distinct electric circuits—one connected with each of the plugs, and means for using the circuits and plugs separately so that the plugs may be used alternately, whereby, when the ignition contects upon one plug become coated with oil, so that the spark does not pass properly, the other plug may be thrown into use and the explosions occurring therefrom may be allowed to burn the oil or other deposit from the contacts of the plug just abendoned.

In carrying out my invention, I preferably use electric circuits of different character associated with the different plugs—that is, when used in connection with automobiles I prefer to connect one of the plugs with a battery circuit and the other with a magneto-generator circuit. I also preferably arrange these circuits so that they may both be used at once, as it may frequently occur in an engine comprising a plurality of cylinders that one of the plugs of one cylinder may become coated, while the opposite plug of another cylinder may become coated, so that in order that all cylinders may explode properly, it is necessary to use botb of the electric circuits at once.

My invention relates further to certain details of construction hereinafter described and shown in the accompanying drawings forming a part of this specification.



Cross Section of the Apperson Dual Ignition.

If the Apperson patent is as broad as its claims, which is the matter that will demand some attention, on the part of users of dual ignition systems, it will be a very interesting matter in the near course of events. The claims of the Apperson patent are as follows:

1. An explosion engine heving a cylinder in which the explosive is adapted to ignite, a pair of spark plugs extending into the cylinder, a magnsto, eiectrical connections from the magneto to ons of the spark piugs, a battery, separate electrical connections from the battery to the second spark plug, and a switch for throwing the spark plugs into and out of operation.

2. An explosion engine having a cylinder in which the explosive is adapted to ignite, a pair of spark plugs extending into the cylinder, one of said spark plugs having a fixed spark gap, a magneto electricaliy connected with one of the spark plugs, a battery electrically connected witb ths other spark plug, a periodic circuit interrupter in the connection to the spark plug having the fixed gap, and means to control the connections to ths spark plugs.

3. An explosion engine having an explosion chamber with two spark plugs therein, a magneto electricaliy connected with one spark plug, a battery electrically connected with the other spark piug, adjustable timers in the respective circuits, and means for adjusting the timers similarly and simultaneously.

4. An explosion engine having a cylinder in whicb ths explosive is adepted to ignite, a pair of permanent spark gaps within said cylinder, a magneto electrically connected to the terminals of ons spark gap, a battery electricaliy connected to the terminals of the othsr spark gep, and circuit interrupting devices in each of said connections.

5. An explosion engine having a cylinder in which tbe explosive is adapted to ignite, a pair of spark piugs extending into the cylinder, a magneto in circuit with one of said spark plugs, an induction coil having its secondary in circuit with the other spark plug, and a battery in circuit with primary of said induction coil.

Conclusions at this time would be futile. The whole matter will simply have to be threshed out in a businesslike way, or in the courts, if business acumen so dictates.

A ROTARY ENGINE, SAID TO BE WONDERFUL.

PITTSBURG, Dec. 21.—A new engine for which some big claims are made has been invented by Newell O. Allyn, of Hiram, O., formerly with Packard and Winton. It is of the rotating cylinder type, four air-cooled cylinders being used. These are operated on the two-cycle principle and have no valves, the inlet and outlet ports being opened and closed by the rotating part of the machine. No flywheel is provided owing to the large rotating mass of the cylinders. Contrary to most revolving motors a muffler is provided and somehow attached to the cylinders.

It is stated that there is no battery to get out of order. This may be, but a more complicated mechanism will then be necessary to supply the ignition current.

This "wonderful new" motor is to be installed in a car fitted with a sliding gear transmission; the engine is placed in front under the customary hood and the gas tank carried under the front seat. A company, the Valley Automobile Co., of Warren, O., with $200,000 capital, has been organized and the plant for manufacturing this engine and car will soon be started.

The claims for the engine are light weight, simplicity, strength and graceful appearance. From the scant description at hand it is hard to see any point in this motor not already well covered by such sterling machines as the Adams Farwell five and seven cylinder rotating engine or the Torbensen three and four cylinder rotating motor.

Colors Show Temper of Horses.—An automobile authority, who has made a study of horses, is authority for the statement that sorrels are the only absolutely safe horses, white animals, on the other hand, always being dangerous. Between these two extremes comes the bays and the blacks, the former being the better natured of the two. Automobile drivers will save themselves lots of trouble by remembering this point and driving very carefully past a white horse.

LETTERS INTERESTING AND INSTRUCTIVE

TANKS FOR CARBONIC ACID TIRE INFLATERS.

Editor THE AUTOMOBILE:

[1,684.]—If carbonic acid is ueed in the inflation of tires and in view of tbe bigh pressure that obtains with the same in the liquid state the question arises as to the safety of the same especially if it is exposed to the direct sun's rays on a hot Summer day in the South. What can be said about this phase of what would be regarded as a serious matter in other zones of activity? P. B.

New York City.

True, the pressure is high. Equally true the containers must be designed to withstand the pressure, and it is well not to expose the same to more heat than that normal to the surroundings. That the vendors of this gas for any purpose are interested in rendering its use safe, is a matter that can be taken for granted. On a basis of 120 degrees Fahrenheit, according to Reid T. Stewart, in his paper on "The Physical Properties of Carbonic Acid," A. S. M. E., December, 1908, meeting, among other statements, it was said, the walls of a tank, 6 inches outside diameter, should be 0.2514 inches. This is on a basis of 18,000 pounds per square inch extreme fiber strain.

The pressure exerted by carbonic acid on the walls of a cylinder will depend upon the density of the acid and the temperature. At 120 degrees Fahrenheit, and a density of 0.61, the pressure will be 1,760 pounds per square inch, according to the same authority. The thickness given is the minimum, considering the use of material of such physical properties as will allow of a fiber strain as given without eating into the reasonable factor of safety that should obtain in a case of tbis sort.

THE RELATION OF POUNDS TO KILOGRAMS.

Editor THE AUTOMOBILE:

[1,685.]—In connection with racing in particular, it is, more often, tban not, that the weight of cars will be referred to in kilograms. What is the easiest way to reduce theee units to English?

New York City. YANK.

Use the formulas as follows:

$$\text{lbs.} = \frac{75 \times Kg}{34}$$

hence:

$$Kg. = \frac{34 \times lbs.}{75}$$

Example:

If a racing car is to weigh not more than 2,204 pounds, what will be the equivalent weight in kilograms?

$$Kg. = \frac{34 \times 2{,}204}{75} = 1{,}000 \text{ kilograms (in round numbers)}$$

and

$$lbs. = \frac{75 \times Kg.}{34} = 2.204$$

REQUIREMENTS FOR A CAR ENTERING CANADA.

Editor THE AUTOMOBILE:

[1,686.]—I am contemplating a tour East next Summer, and would like to know, if I ehould return by the way of Niagara Falle and through Canada to Detroit, if I will have any trouble with customs at Niagara Falls or Detroit?

Waterloo, Ia. W. HILLMAN.

If you become a member of the Automobile Club of Buffalo, upon presentation of a membership card, you will be able to spend three days in Canada, without any other formality. Otherwise, to conform to the "custom" requirements will be necessary. Briefly, you will have to deposit $25 and put up a bond double the estimated duty on the car. The forms in force at the Custom House must be used and you should produce a bill of sale, showing the purchase price of the car. The more clearly you present your case, the less trouble you will have. For further information, see "The Automobile Official Blue Book," section 1.

INDICATION OF CONSIDERABLE DEPRECIATION.

Editor THE AUTOMOBILE:

[1,687.]—In order that I may determine the extent of repairs to be made to my double opposed engine, will you kindly answer the following through "Letters Interesting and Instructive."

1. When compression leaks past piston and rings very badly, what does it signify, assuming that rings have not turned?

2. With ringe removed from piston, should the piston be a close fit in cylinders?

3. How can I determine whether or not I will bave to have tbe cylinders rebored in case I have to have new pistons?

4. Will I have to get the piston that was designed for the motor, or will any other piston do that will fit?

5. With both rear wbeels jacked up and a pull exerted on the left rear wbeel, there isn't any lost motion between wbeel and differential; they both act as a unit. But with the rigbt rear wheel when pulled there is quite a lot of play, say about an inch on the circumference of tbe wheel, before the power is applied to the differential. Is this condition right? NEW OWNER.

South Braintree, Mass.

1. Loss of compression, which, in turn, means loss of power, is the first answer.

2. In reply to the second question. No. The piston becomes hotter than the cylinder, because the cylinder is artificially cooled and the piston is not. The hotter piston will expand the most, and, as a consequence, it will stick, if there is not a difference.

3. "Size" the cylinders. If they are out of round, they should be rebored.

4. It is best to get pistons such as were designed for the motor, if they proved to be valuable for the purpose. If you find that the design is not good, then it will be time to experiment.

5. The rear axle seems to be in need of overhauling. The condition is not right. It is not much of a job to take it apart and see just what is at the bottom of the trouble.

CERTAIN CAUSES OF LACK OF POWER.

Editor THE AUTOMOBILE:

[1,688.]—I have a two-cylinder Ford, Model T, whicb I bought second-hand. It runs fairly well, but it will not develop much power with the throttle wide open. The compression is poor. It cranks eaeily. The beet authority here says it needs new pistons. Is it ljkely he is right? Or is it probable that new piston rings would be sufficient? Ie it possible that it would be best to get new cylinders and new pistons? What might be other causes for its having so little power? J. B. NEILL.

Pecos, Tex.

What you say would seem to indicate that the carbureter wants attention. If the compression is diminished, you can determine the fact by cranking. On the other hand, you cannot expect to realize "difficult" cranking (due to a high compression) in a motor with cylinders less than 4 inches bore. To "spin" a four-cylinder motor, such as the one you are the possessor of, is not a difficult task, and the "experts" may be mistaken. If your carbureter is not in good working order, it will manifest itself by "dead points" in the range of speed. If the carbureter is in good order, then you can look to the timing and the battery. A good (energetic) spark at the propitious instant will do wonders for you. There probably is small reason to go to the expense of new pistons, in any case; the question of new rings is a matter to be taken up when the carbureter and the timing, as well as the source of the electric energy, are fully investigated, and found to be competent.

MADE BY SIMPLEX COMPANY, NEW YORK CITY.

Editor THE AUTOMOBILE:

[1,689.]—I have a complaint to make and some questions to ask. The questions will help explain the complaint, and I will ask them first.

1. Whose Simplex car is handled by Palmer & Singer, of New York and Chicago—the Sheffield Simplex, of England; the Simplex, of Mishawaka, Ind., or the Simplex made where?

2. What (i. e., maker) Simplex car won the second Brighton Beach 24-hour (Robertson-Lescault)?

3. What Simplex wae victor in the Long Island Motor Parkway Sweepetakes, Lescault driving?

4. What Simplex (Seymour) stood about eleventh in the Thanksgiving Day Grand Prize race at Savannah? Was it the two-cycle car or what?

5. Wae it ths $1,000 Buicke (formerly $900) that were driven by Hearne, Eaeter and Jeffers in tbe light-car race at Savannah?

You, in common with other automobile papers, do not give sufficient details pertaining to the care and the manufacturers participating in various events in this country and abroad.

La Fayette, Ind. A SUBSCRIBER.

1. The Simplex product handled by the Palmer & Singer Mfg. Co. is manufactured in New York.

2. It was the Simplex of Palmer & Singer that participated in the second Brighton Beach 24-hour race, which event it won with 1174 miles to its credit, thus establishing a new American competition record.

3. Again it was a P. & S. Simplex stock car which scored in the Parkway Sweepstakes.

4. The P. & S. Simplex at Savannah was the same one which proved a winner in the 24-hour race.

5. Perhaps the Buick company might care to answer.

CONSIDERABLE FLEXIBILITY IS AIMED AT.

Editor THE AUTOMOBILE:

[1,690.]—What is the advantage of having universal or cardan joints on each sids of the differential; also the arched axle and dished wheele as on ths Peerless? Is it a fact that carbureters having the float chamber set to one side of the spray jet give trouble going around corners and up bills? Are valves-in-head engines, with both valves actuated by one double acting cam, considered an entire success?

Marysville, O. L. PIPER.

If the axle is arched, the spokes of the wheels will be "plumb," presupposing a camber in the road. The Peerless construction is such as to enable the car to negotiate roads in which the usual camber is to be taken into account, and also tires are thus enabled to take the load fairly. There are other matters that could be taken into account in this connection, as the workmanship in general of the same axle. Obviously the universals, in the absence of good practice in other ways, in an axle would be of no great avail. If "float chambers" set to one side, as you say, give trouble, it would seem to follow that it is not good practice to do curves at high speed.

Your question as it is put is not fair to the scheme of valves you refer to. There is a certain amount of trouble about or in connection with every mechanical device that man ever turned out. To say, then, that there is to be no trouble with any one scheme, is to be a little farfetched. The fact that the scheme is in vogue, at the instance of builders of repute, coupled with the fact that its use is continued, is good assurance of commercial success. In point of theory it is an excellent idea.

HERE'S A KICK FROM MILWAUKEE.

Editor THE AUTOMOBILE:

[1,691.]—In your issue of December 10, under the head of "Newe in General," tbere is a paragraph entitled "Another Triumph for Locomobile." After attributing to Pabst the honor of having mads Milwaukee famous instead of to Schlitz, who was the originator of that phrase, you proceed to make some very peculiar statements. While we are willing that our competitors shall have all ths glory that belongs to tbem, that "to him that hath shall be given," so that more shekels may be poured into tbe coffers of Jeffriee, we hardly think it right that an infant industry like ourselves ehould be robbed of the credit of having eold to the board of echool directors a car. Then you say that the board of public works is about to choose a car. Well, what for? Not for themselves. Then you speak of the common council appropriating $4,600 for a police car. So far you are right, and you are also right when you say that the chief wants a Locomobile, but the whole bunch has been trying to pretend that there was competition. At present we have an injunction againet the board of public works and the chief of police, demanding tbat the automobile shall be bought upon specifications, advertisement and lowest bidder, like other material and supplies. You also are giving the Locomobile very great credit for track races in Milwaukee. Did you know that in the last track race it used up forty tiree in twenty-four hours? Do you call this an endurance run or a non-endurance run if $1,600 worth of tires ie the price of a merry-go-round victory? JOHNSON SERVICE COMPANY.

Milwaukee, Wis. W. S. Johnson, President.

P. S.—Since the above was written the real estate board of thie city has passed a resolution requesting all city departments to purchase automobiles made wholly or in part in the city of Milwaukee where such purchaee is consistent with good work.

THE AUTOMOBILE CALENDAR

AMERICAN.

Shows and Meetings.

Dec. 31-Jan. 7..—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reeves, General Manager, 29 West 42d Street.

Jan. 5.....—New York City, Fourth Annual Meeting Society of Automobile Engineers. (Will adjourn until January 19 after opening session.)

Jan. 16-23.....—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. M. L. Downs, Secretary, 7 West 42d St., New York City.

Jan. 27-Feb. 3..—Philadelphia, Second Regiment Armory, Eighth Annual Show, Philadelphia Automobile Trade Association.

Feb. 6-13.....—Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. S. A. Miles, Manager, 7 East 42d St., New York.

Feb. 15-20.....—St. Louis, New Coliseum Building, Third Annual Show, St. Louis Automobile Manufacturers' and Dealers' Association. Lloyd Ricksrt, Manager.

Feb. 15-20.....—Detroit, Wayne Pavilion, Annual Show, Detroit Automobile Dealers' Association. E. LeRoy Pelletier, Manager.

Feb. 15-20.....—Cleveland, First Regiment Armory, Annual Show, Cleveland Automobile Dealers' Company.

Feb. 16-18.....—Denver, Col., Auditorium, First Annual Automobile Show, Denver Motor Club.

Feb. 18-25.....—Toronto, St. Lawrence Arena, Third Annual National Automobile, Motor Boat and Sportsmen's Exhibition. Ontario Motor League. R. M. Jaffray, Manager.

Mar. 1-6.....—Buffalo, Convention Hall, Seventh Annual Automobile Show. Buffalo Automobile Trade Association. Dal H. Lewis, Secretary.

Mar. 6-13.....—Boston, Mechanics Building, Seventh Annual Automobile Show, Boston Automobile Dealers' Association. C. I. Campbell, Manager, 5 Park Square.

Mar. 27-Apr. 3..—Pittsburg, Duquesne Garden, Automobile Show. Pittsburg Automobile Dealers' Association.

Races, Hill-Climbs, Etc.

Jan. 1-2.....—Philadelphia, Two-day New Year's Run of the Quaker City Motor Club.

Feb. 20-22.....—New Orleans, Fair Grounds Track, Mardi Gras Race Meet, New Orleans Automobile Club. Henry George, Secretary.

March 5-12.....—Palm Beach, Fla., Lake Worth, Fifth Annual Regatta, Palm Beach Power Boat Association.

FOREIGN.

Shows.

Jan. 16-25.....—Belgium, Brueeels Automobile Exhibition.

Races, Hill-Climbs, Etc.

May 2.....—Sicily, Targa Florio, Automobile Club of Italy.

May 26.....—Russia, Moscow—St. Petersburg Race.

June 10-18.....—Germany, Prince Henry Cup Competition.

June 14-19.....—Scotland, Scottish Reliability Trials.

July 1-3.....—France, Angers Course, Grand Prix, Automobile Club of France.

July 13-17.....—Belgium, Ostend Automobile Race Week.

Sept. 5.....—France, Mont Ventoux Hill Climb.

Sept. 11-19.....—Italy, Bologne, Florio Cup Race, Automobile Club of Bologne.

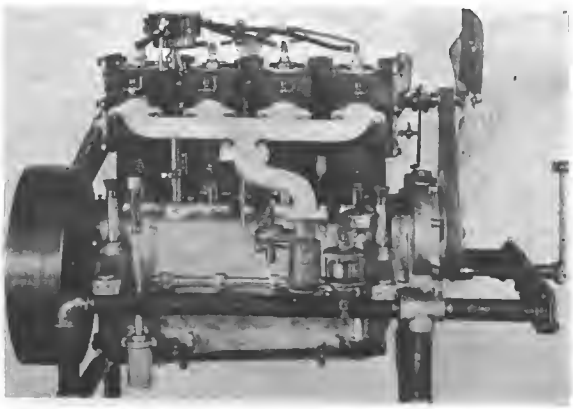
Pullman in Several 1909 Models

Five-Passenger Touring Type Pullman for 1909, as Seen from the Operating Side.

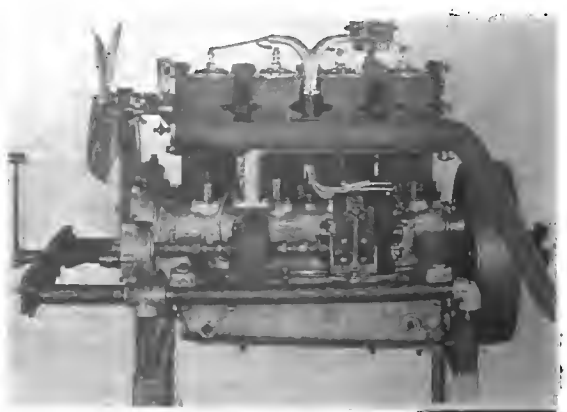
IN order to be in a position to supply as widely varying a demand as possible, the York Motor Car Company, York, Pa., will list no less than four different chassis for the 1909 season, each of which will be made in several body types so that the range of Pullman cars will be very extended. At the lower end of this list is the new Model L, 20-horsepower runabout; next comes the Model K, 30-horsepower light touring car, while a six-cylinder car of the same power is to be known as the Pullman Model 6-30. Above this where power is concerned is the Model 4-40, which, as its name indicates, is a four-cylinder car of 40 horsepower. This title, however, only applies to it as a gentleman's roadster, as in a seven-passenger type of touring car, it is known as Model M.

Motor Design.—Taking what may best be termed the "baby" Pullman first, otherwise the Model L runabout, its cylinder dimensions are 3 3-4-inch bore by the same length of stroke, while its rating is 20 horsepower, with a speed range of from 200 to 2,000 r.p.m., though its nominal capacity is developed at a moderate speed, namely, 1,000 r.p.m., and it is naturally capable of exceeding this power output to a considerable extent. Like its larger confrères of the Pullman line, the cylinders are cast separately. The Model K, 30-horsepower type, has 4 1-2-inch "square" cylinders, its speed range extending from 150 r.p.m. to 1,800 r.p.m., while its output is delivered at the moderate normal speed of 900 r.p.m. The same cylinder castings as are employed on the Model L, 20-horsepower runabout are also utilized as the foundation of the power plant of the Model 6-30, while in the case of the 4-40 the cylinder dimensions are 5-inch bore by 5 1-4-inch stroke, its rating also being delivered at 900 r.p.m. As the same features of design and construction that have characterized the Pullman motors during the past year are perpetuated in these new models, it will be evident that a description of the features of one is applicable to the others, so far as the motor itself is concerned, its accessories, such as the magneto in particular, depending more upon the list price of the car. For instance, the cylinders are cast separately in every case, while on the Model L and the Model 6-30 Pullman, the valves are all on the same side; in the case of the Model 4-40 and the Model M, the valves are oppositely disposed in outboard valve ports and are interchangeable. The cylinder heads and waterjackets are cast integral in every case, an interesting feature of the Pullman motor, being the manner in which the independent castings are joined together by means of special fastenings between them, thus throwing the waterjackets of all four cylinders into one.

Chassis Specifications.—Standard practise has nowhere been departed from. The remaining specifications of the Model L, 20-horsepower car are pressed steel frame of the usual channel section, with a substantial subframe carrying the engine and transmission, Timken rear axle, single-piece drop-forged I-beam, front axle; jump-spark ignition through a single vibrator coil and distributor fed by a set of storage cells; lubrication by means of a new self-contained system, a positive oil level being maintained by a valve adjustment. The gear-set housing is packed with lubricant and grease cups are provided wherever necessary. A standard type of leather-faced cone clutch using cork



Pullman Power Plant Viewed from Carbureter Side.



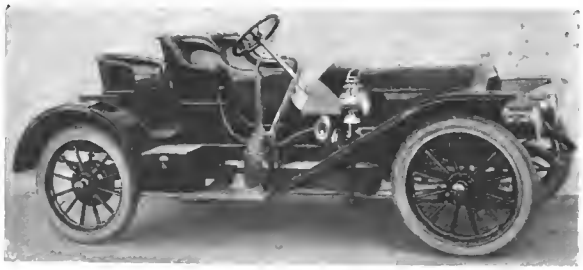
Fan Pump and Magneto Drive of the Pullman

inserts is employed in connection with a three-speed gear-set operating on the selective principle of shifting, the shafts of the latter being carried on Hess-Bright annular ball bearings, while the Timken roller bearings are used in the wheels. The suspension consists of semi-elliptic springs front and rear, the former measuring 40 by 2 inches, while the latter are 48 by 2 inches. The wheelbase is 102 inches, the tread standard and the clearance 10 inches, while the car weighs 1,750 pounds. With the usual equipment, including two acetylene headlights, the car lists at $1,500.

Model K, 30-horsepower Pullman is a machine that comes between the other two four-cylinder types, the Model L, 20-horsepower, and the Model 4-40, so far as power is concerned, it will doubtless constitute one of the most popular of the Pullman models, and will accordingly be listed as a five-passenger light touring car, a roadster and with a toy tonneau. On a larger scale, corresponding to its increased power, the specifications of the chassis are practically the same as those already given in the case of the 20-horsepower car, namely, pressed steel frame, with a subframe for the motor and transmission support, drop-forged one-piece I-beam front axle, semi-elliptic springs all round, the dimensions in this case being 40 by 2 inches front and 50 by 2 inches rear. The wheels are 34 inches instead of the 32 by 3 1-2-inch size used all round on the smaller car, while the tire equipment consists of 3 1-2-inch front and 4-inch rear tires. For ignition a Bosch high-tension magneto forms a regular part of the standard equipment. The same type of three-speed selective gear-set is employed, the gears and shafts being of chrome-nickel steel, while the latter are supported on Hess-Bright imported ball bearings, the latter being used throughout the car, with the exception of the motor. Nickel steel shafts and gears are employed in the rear axle, which is made with pressed steel housings and is held in alignment by means of a V-type torsion rod.

Dual ignition is regularly fitted on this car, the emergency system consisting of a single vibrator coil on the dash and a high-tension distributor. So far as the other accessories are concerned, the same self-contained oiling system, made integral with the motor, is a feature of this, as it is of the other Pullman motors, and this is likewise true of the special float-feed carbureter. The wheelbase is 106 inches and the tread standard, while the weight all on, is 2,250 pounds. In complete running order with the usual equipment of acetylene headlights, sidelights, etc., the car lists at $2,000.

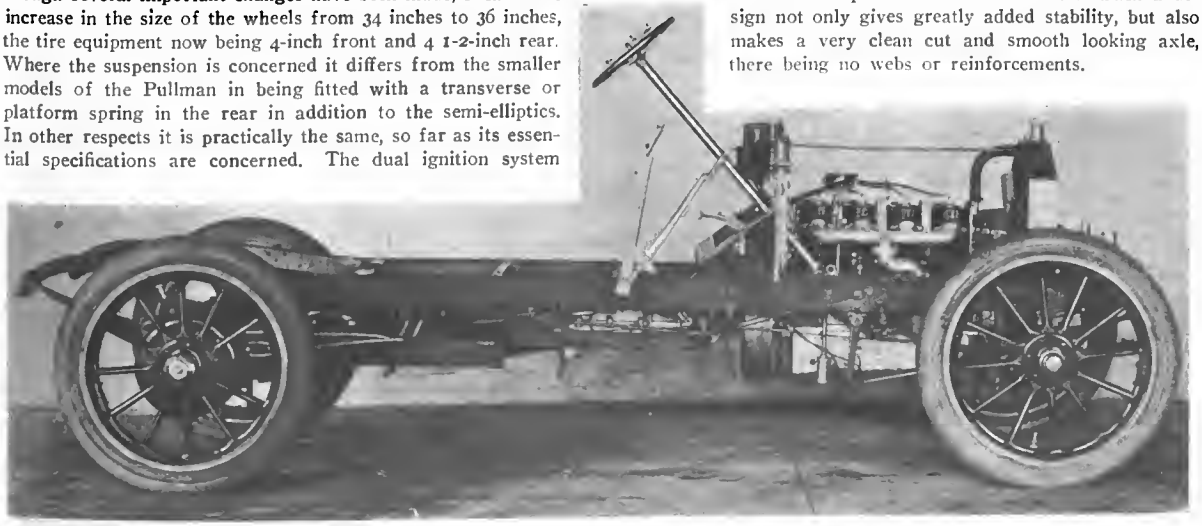
Model M has been designed especially to meet the wants of the purchaser of a seven-passenger touring car, the chassis being practically the same as the 40-horsepower Pullman of 1908, though several important changes have been made, such as the increase in the size of the wheels from 34 inches to 36 inches, the tire equipment now being 4-inch front and 4 1-2-inch rear. Where the suspension is concerned it differs from the smaller models of the Pullman in being fitted with a transverse or platform spring in the rear in addition to the semi-elliptics. In other respects it is practically the same, so far as its essential specifications are concerned. The dual ignition system



One of the Pullman Three-Seaters for 1909.

consists of a Bosch high-tension magneto and a synchronized single-coil and distributor supplied by storage cells; a three-speed selective gear-set is employed, Hess-Bright annular ball bearings being used here as well as in the remainder of the car. The front axle is a one-piece I-beam drop-forging, while the rear axle is of the floating type made by Timken with a pressed steel housing. In the case of the Model K, 30-horsepower Pullman two brakes are placed on the rear wheels, while a third, which constitutes the emergency, is placed on the transmission shaft, while on the Model M, 40-horsepower car, both sets of brakes are placed on the driving wheels. The wheelbase is 119 inches and the tread standard, the car having a clearance of 10 1-4 inches. The weight all on is 3,100 pounds and the list $3,500. As a runabout the same chassis is slightly altered to make the Model 4-40, which lists at $3,000, the same as last year.

One of the distinguishing features of the Pullman car is the use of the Timken rear axle unit, which represents a great advance over the usual design for this essential. One of the great troubles with the present form of built-up axle is that it requires a truss to brace and stiffen it, and, as it is more or less difficult to keep the members of the truss under tension, this constitutes an element of weakness. The Timken Company in manufacturing this new axle have taken advantage of the fact that tubular forms give great strength, while the resistance is distributed proportionally to the points of greatest stress by grading the thickness of the metal so that the heaviest parts are at the spring seats where the strains are greatest, and the thin parts are at the center. The axle has been so designed as to carry the load without the necessity of trussing, a pressed one-piece housing of a special grade of basic open-hearth steel of high static resistance being employed. In the design of this axle, sharp curves have been entirely eliminated, thus avoiding any angles which would tend to add leverage and increase the liability of shock at the points of least resistance. Such a design not only gives greatly added stability, but also makes a very clean cut and smooth looking axle, there being no webs or reinforcements.



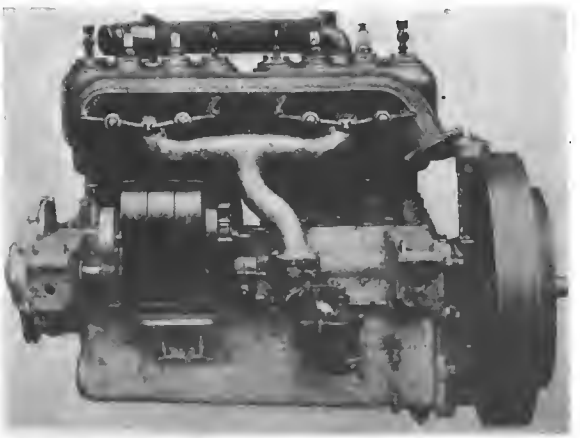
Side View of the Pullman Chassis Illustrating Its Well Balanced Outline.

Regal in 1909 Form

By CHARLES B. HAYWARD.

DETROIT, Dec. 21.—Upon reviewing the specifications of the Regal car for the 1909 season, with the subject of the inspection before one, the conclusion that the makers' efforts to combine the best features of standard practice in a machine selling at a low figure have been very successful is inevitable. And it is further substantiated by an inspection of the manner in which the work is being carried out in the Regal factory, for the best of materials and design would be of doubtful value when handicapped by poor workmanship. As a matter of fact, it was the original intention of the Regal Motor Car Company to place its product on the market at a higher price, but it was found possible by means of multiple production on an extended scale to reduce the figure to $1,250, at which the Regal now lists. But for the delay in perfecting a factory organization, a large number of the Regal cars would have been placed on the market during the past season. Shipments of the new model began about a fortnight ago, and with greatly increased manufacturing facilities, it is the intention of the makers to market as many cars as it is possible to turn out, though it it planned to make 2,000.

Some Motor Specifications.—In the details of the design of the power plant and its accessories particularly are to be found a number of features ordinarily confined to much higher-priced construction. Among these may be mentioned the use of a one-piece drop-forged camshaft, the cams being integral. They are hardened and ground to an accurate finish with a set of master cams as a model, thus insuring interchangeability and close adherence to the timing regulation outlined by the designer in every one of the many motors turned out. The cylinders measure 4 by 4 inches and are liberally water-jacketed, water being provided for between the valves. Large openings are provided in the cylinder heads, these being covered with plates carrying the cooling water outlets. Circulation is on the thermo-syphon principle, the outlets from the cylinder heads measuring 1 1-2 inches in diameter, while the connection from the lower portion of the radiator to the jackets measures 2 inches, deflected plates being employed to spread the incoming cold water. The hot-water outlet takes the form of a Y, the water being discharged into the tank portion of the radiator, thus condensing any vapor formed and effectively preventing steam pockets.



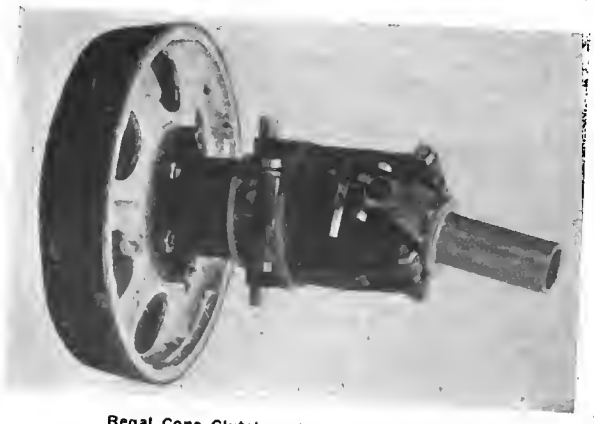
Regal Power Plant Shows Simplicity and Compactness.

All valves are placed on the same side, the push rods being equipped with roller ends, while the valves themselves are of large diameter, so that in connection with well-worked-out manifolds, an easy flow of gas is provided for. Main bearings are of liberal size of die-cast babbit, while drop-forged connecting rods are employed. Helical timing gears enclosed in an aluminum housing make for silent running, the oil pan also being of this material, while the engine base is of cast iron. The lubricating system itself is particularly noteworthy. It is of the constant circulating type, consisting of a small gear pump, placed at the lower rear right-hand corner of the oil pan, from which it takes its supply. From the latter the oil is raised and discharged into a copper tube of liberal dimensions running the entire length of the crankcase and parallel with the crankshaft at about the same height as the journals of the latter. Holes are drilled in this tube at intervals to correspond with the various bearings, and when the pump is in action oil is spurted on each of them in liberal quantities, splash being depended upon to lubricate the piston and wrist-pin. Small brass petcocks are inserted in the crankcase at two levels to show the state of the supply in the oil pan. Both the tube and its discharge holes are of large dimensions and are consequently proof against clogging, but provision is made for examination, as the tube may be easily withdrawn without disturbing anything but its own fastenings.

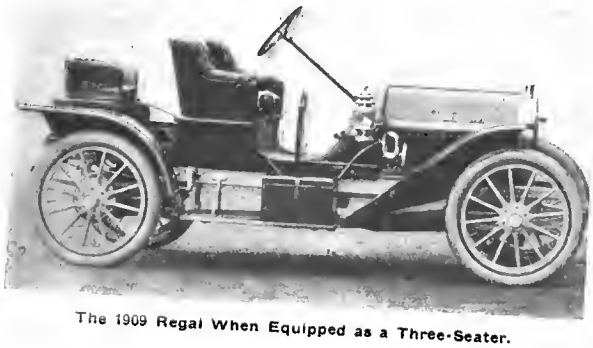
Ignition is taken care of by a Remy magneto of the high-tension type employing a single coil, the latter being mounted on the dash. Experience with this installation has shown that there is no necessity of using batteries for starting, but an emergency system consisting of a set of dry cells operating the same spark plugs through the distributor of the magneto has been provided. The remaining accessories consist of a Buffalo carbureter and a McCord radiator of attractive design.

Clutch and Drive.—Standard practice has been adhered to in the conical leather-faced clutch, but here again the effort to provide the best of its kind, regardless of the selling price, is evident in the detail of the design. The engaging spring is of the self-contained type, thus avoiding thrust, while flat springs are placed beneath the leather facing to insure gradual engagement. Lubrication is taken care of by packing the clutch spring housing full of grease. Two universals, one of which combines a telescopic joint, are employed on the propeller shaft, extending from the clutch to the combined change speed gear and drive on the rear axle, the angle of the shaft being such that the drive is practically a straight line when the car is carrying its normal load.

A short distance back of the clutch is placed a transverse pressed steel member riveted to the sides of the frame. This serves as the forward support of the tubular torsion rod, surrounding the propeller shaft. The double universal at this end is of the cross-pin type, the pins measuring 1 inch in diameter, while liberal bearing surfaces are allowed. The whole is enclosed in a babbited malleable iron housing. The rear axle



Regal Cone Clutch and Double Universal.

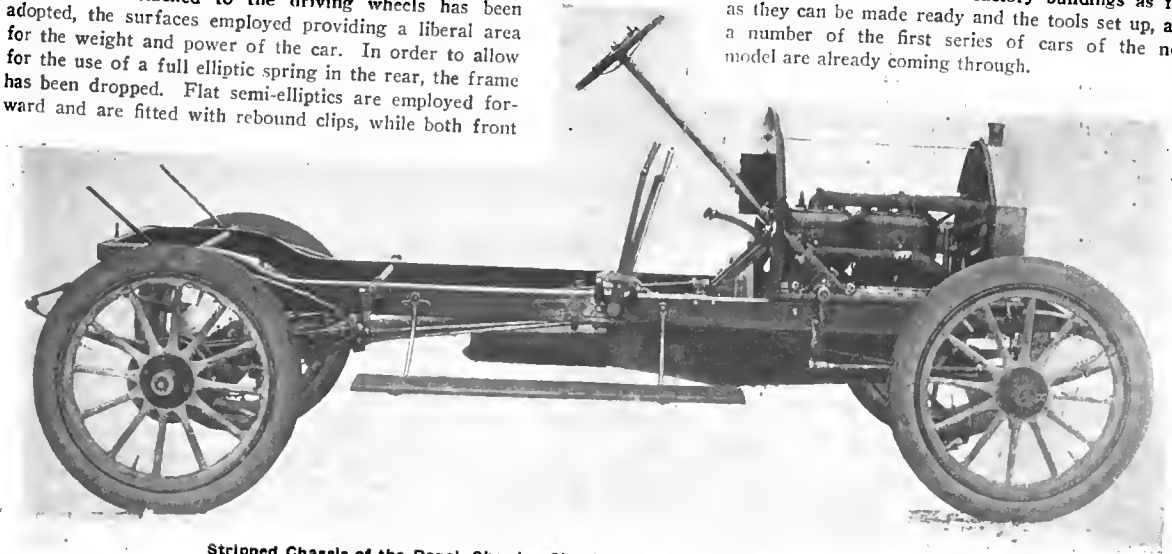


The 1909 Regal When Equipped as a Three-Seater.

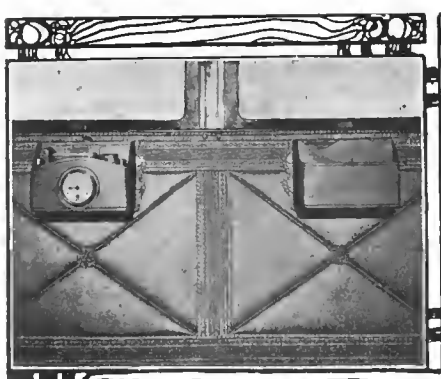
driving combines a three-speed selective change-speed gear box, the bevel drive and the differential in a housing of small dimensions and correspondingly light weight for the whole member, thus obtaining the advantages of the unit form of construction in assembly without the disadvantage of a great deal of unsprung weight on the rear tires. The rear axle is of the fixed type, being made fast at the outer ends directly to the wheels, Hyatt roller bearings being interposed between the driving shafts and the supporting tubes, while ball bearings are used in the gear-set. The usual rear wheel braking equipment in the shape of a set of internal and external contracting shoes acting on a drum attached to the driving wheels has been adopted, the surfaces employed providing a liberal area for the weight and power of the car. In order to allow for the use of a full elliptic spring in the rear, the frame has been dropped. Flat semi-elliptics are employed forward and are fitted with rebound clips, while both front and rear springs are of ample length and number of leaves to insure easy riding at all speeds. The frame is of the usual channel section pressed steel construction, amply reinforced, while the front axle is of the tubular type. The wheelbase is 106 inches.

This chassis will be known as Model A in the regulation touring-car type, and as Model B, as a roadster. Throughout the design every effort has been made to keep the weight down while still providing a liberal factor of safety, with the result that the touring car complete tips the scales at 1,900 pounds, and the runabout is 75 pounds less. In addition to these two there will be the Regal Model C, which will be continued as a taxicab, while Regal Model E will be equipped with a toy tonneau type of body and will be ready for delivery about January 15, so that the Regal line for 1909 will present quite a range of models, although but one type and size of chassis will be made, thus making it possible to center the entire facilities of the plant and working force on the production of series of the same sizes in parts throughout the entire manufacturing season. In this way the number of complete cars that can be turned out in a given time is very largely increased.

The Regal factory has been running night and day for some time past in getting cars, but with the recent addition of fully 50,000 feet of floor space it is anticipated that no difficulty will be encountered in building and delivering the output of 2,000 cars that have been planned for. New machinery is being installed in the additional factory buildings as fast as they can be made ready and the tools set up, and a number of the first series of cars of the new model are already coming through.



Stripped Chassis of the Regal, Showing Simple Lines of Design and Clean Underbody.



LUXURY IN LIMOUSINES

AS typical of the present day refinements in high-powered limousines is the interior of a special car for Robert L. Fryer, of Buffalo, built by the E. R. Thomas Motor Company. This body has an interior seating capacity for five people, the auxiliary seats being detachable. When not in use these are simply removed from a socket, which is then very inconspicuous. The car is a six-cylinder 70-horsepower Thomas, with a hand-hammered aluminum body made in the new two piece construction. This is the latest type of construction in metal bodies and one that is thought well of by the up-to-date coach builders.

The doors have a full royal turn-under and the low base body does away with the awkward appearance sometimes found in large limousine bodies. A wheel house on the side quarters gives ample clearance to the guard and permits the use of chains without the slightest interference.

The car has an effective color scheme. The body is painted a Napier green with black moulding and black upper quarters, while the hardwood finishings are in walnut. A new type of drip on the roof prevents the water from dripping over the doors. The material of the interior is a golden drab imported broadcloth and the lace is of a French weave to match. While being a full round cornered body, the trimming is put on in a panel or square corner effect. All the fittings are in brass. The toilet case contains numerous articles, as in the latest cases, and the new style hasty notebook. There is also a gentleman's case, containing ash tray, cigar holder, etc. In keeping with the high-grade completeness, there is also a Chelsea eight-day "Safety" limousine clock, most useful as well as ornamental.

The electric annunciator of the new French type and the electric cigar lighter are both neatly arranged. The electric dome light has a Holophane globe. A ventilator in the front of the body, allowing the circulation of air, adds to the comfort of the occupant and can be regulated according to the weather. Instead of using the clouded horn trimmings, this car is fitted with a new Maltese pearl, which is exceedingly handsome. While the outside of the window frames are finished in ebony, the interior is left in natural walnut, harmonizing with the trimmings.

THE MODERN TREND IN LIMOUSINE DESIGNING

THE time was when limousine body work was so very heavy as to be objectionable. The reason for this was more because of the distribution of the weight, rather than a matter of the total thereof. In other words the center of gravity was very high indeed, and the rolling tendencies were far from satisfactory. In the early days the wheelbase was short and the weight distribution was, on that account, in favor of a high center of gravity. Increasing the length of the wheelbase had the effect of lowering the center of gravity because the weight in pounds per foot of length was increased, which was equal to decreasing the weight in pounds per unit of elevation.

It is easy enough to see that any plan which increases the weight per unit of length, for a given weight, would decrease the weight per unit of elevation, and lower the center of gravity. That a lower center of gravity will help the performance enormously goes without saying, and much of the modern luxuriousness is due to the superior performance of the cars, directly traceable to the lowered center of gravity. The greater length results in more room, but the whole gain was not due to the greater wheelbase, since motors are shorter than they were before and in this fact is a further reason for increased comfort.

Still, the last word has not been said. The design details of limousines have undergone considerable change within a short period of time. It was recognized that easy riding qualities were in a measure due to weight, putting the same in the right place. The result of this reasoning led to heavy underframing and light upper work. In thus proceeding it was to render the body work strong enough to stand road strains, and at the same time engender that "Pullman" effect so much to be desired.

The better distribution of the weight also reduced the strains, and as a consequence the depreciation of this class of bodies is a very much reduced factor. Then, again, there is the use of superior materials throughout; certainly there has been quite as much gain in this direction as in other ways. It is fortunate that the finish will stay on the modern bodies far longer than was the case in the earlier examples due to the fact that the panels will not split and the vibrations are not nearly so noticeable. On the whole, then, it is plain that the great improvement wrought in limousine construction is not limited to luxuriousness within.

Then again, there is the influence of the limousine upon the life of the chassis. If the body work is with a high center of gravity, the car as a whole will be with a higher center of gravity than would obtain otherwise, since the body is superimposed. To deny that rolling and tossing will not affect the life of a car is to overlook the prime causes of depreciation on automobiles. The difference as between static strains and dynamic work is the difference as between assured long life and a great uncertainty. A limousine, presupposes a user who can afford a good car, and one who would not want to put up with one that has failed to sustain in nearly perfect order.

COMPARING LONG AND SHORT-STROKE MOTORS

By E. A. MYERS, Designer of Model Automobile Company, Peru, Ind.

WHILE there is so much discussion as to the relative merits of the long and short-stroke motor it is somewhat interesting to make a comparison of the different articles written on the subject and to note the grounds upon which each bases his claims.

In the beginning I will say that my knowledge of gas engine construction has been practical as well as theoretical. During the fifteen years I have devoted to the study of this subject I have superintended the construction and testing of over five thousand engines of a great variety of sizes and types covering the single-cylinder engines from a 4-inch bore up to a 17-inch bore and 30-inch stroke and the four-cylinder from the very smallest to a 16 1-2-inch bore and a 26-inch stroke. Up to six years ago my work covered what is known as the short-stroke engine, and since that time it has been divided between the short and the long-stroke motor, most of the time having been devoted to the latter.

I do not claim to know it all by any means. Others, perhaps, have found out things in motor construction which I have been unable to learn. On the other hand, I do not believe that I will be charged with egotism when I say that I have at least had an opportunity to find out some things denied to the designer who has had experience with the short-stroke or small motor only. In my experience I have found out things which have been of material advantage to me in the construction of larger engines as a result of my work with the smaller high-speed motors. On the other hand, I have secured much valuable information about small motor construction in my work and experience with large engines which otherwise I might never have been able to detect.

When the A. L. A. M. adopted the plan on which the horsepower rating was based it is quite evident that but little thought was given to the question of accuracy of horsepower. At any rate, just now it is somewhat difficult to get any one to admit that he really believed at any time that the stroke had nothing to do with the horsepower of a motor. On the other hand, it has been but a few years since any attorney involved in the trial of a case wherein the horsepower of an engine was in question had but little difficulty in getting gas engine experts to testify under oath that the stroke had nothing to do with the horsepower of the engine and that a motor with the bore equal to the stroke would produce just as much horsepower as another motor with the same bore and with one, two or more inches longer stroke.

We take it for granted that the recent trend of automobile manufacturers toward longer-stroke motors and the comparative tests of the past year have put to rest for all time the contention that a motor with the stroke equal to the bore would produce as much actual horsepower as one of the same bore with the longer stroke and that we need not spend time on this particular point.

Some Questions to Be Answered.

With this point settled the remaining questions are: First, to what extent does it increase the horsepower? and, second, is the longer-stroke motor more desirable for motor-car construction and service?

In an article recently written by G. H. Baillie he refers to a formula wherein the claim is made that by increasing the stroke 50 per cent. the horsepower is increased 17 per cent. Nothing could be more misleading than a statement of this kind without a detailed explanation on which the claim is based. It appears that those making this statement have lost sight of the fact that speed must be taken into consideration and that it is utterly impossible to give any formula by which the increased horsepower can be shown by increasing the stroke unless a given speed is taken on which to base the rating. For illustration: We take a 6 x 6 four-cylinder motor and make a test of it, as compared with a 6 x 9. At first thought we would figure that the 6 x 9 would develop just 50 per cent. more power than the 6 x 6, whereas at one speed it will develop over 50 per cent. more power than the 6 x 6, and at another speed it will develop less than 50 per cent. Piston speed must be taken into consideration in figuring the actual horsepower delivered.

Other designers may take issue with us at once when we make a statement that a 6 x 9 motor will develop over 50 per cent. more power than a 6 x 6, both running at a speed of 400 r.p.m., but that such is the case can easily be demonstrated. On the other hand, the 6 x 9 will by no means develop 50 per cent. more power than the 6 x 6 when running at a speed of 800 r.p.m. The question then comes up: How are we going to rate the motor for automobile construction, and where are we going to draw the line, and what formula can be presented upon which the accurate horsepower rating can be based, covering engines of all classes and of different construction? We are free to confess that we know of none that can be proposed that will cover the situation with absolute accuracy. If we had a fixed speed from which to figure then the matter would be simple. But considering the fact that these motors must be run from a minimum to the maximum speed of which they are capable, it is impossible to increase the stroke to the greatest point of efficiency for one speed and secure the same results at all speeds.

Desirability of Long Stroke.

I state most emphatically that better results can be secured from a motor with the stroke in excess of the bore for general automobile construction, but I also wish to state just as clearly that it cannot be increased advantageously to the same extent that it can be where the motor is to be used for some other purpose where less flexibility is required and where it is to be operated at something near a given speed. In making this claim I base it on the following facts:

First: Where I increase the power of a motor by adding to the stroke the power gained thereby is procured without any approximate increase in the weight of the motor and it will not be denied that every move that can be made to increase the power without increase of weight is a step toward high-grade motor-car construction.

Second: In expanding the gases farther the exhaust is discharged under less pressure, lessening the noise of the exhaust and decreasing the amount of heat carried off through the exhaust as well as the liability of back pressure.

Third: The greatest efficiency and economy is obtained when piston is running at a reasonably high speed. As most cars are now built the speed limit is from 40 to 60 miles per hour for ordinary use. These same cars probably run 80 per cent. of the time at a speed of 20 to 40 miles per hour. Therefore, it would seem that for general use the car is used at an extremely low piston speed, which, as every engineer knows, means loss of power and efficiency. Hence, by increasing the stroke a higher piston speed will be secured for general use of the car.

Fourth: The full power of a motor is most needed for hill climbing when the motor is running at slow speed, and right here is where the long stroke shows its advantages over the short stroke. Let us not forget the fact that an internal combustion engine is a heat engine pure and simple. In fact, all engines are heat engines, differing only in the method and the economy of utilizing the heat. In the case of steam engines the coal is reduced by heat to a gas, burned, and a portion of the heat generated is absorbed by water in a boiler,

converted into steam and expanded in tbe engine cylinder, giving up a portion of the heat in the form of work or pressure on the piston, producing power. The balance escapes in the exhaust, as is the case with the gasoline engine.

In the Case of the Gas Engine.

In the case of a gas engine the gasoline is mixed with a definite quantity of air as it is conveyed to the cylinder; this mixture is then burned in the cylinder, producing heat, consequent expansion, pressure on the piston and power, hence the term internal combustion engine as applied generally to gas engines.

The gases so formed contain a given number of heat units to the cylinder. The greater part of this heat is utilized, converted into energy from which the greatest amount of power can be gotten. There cannot be conversion of energy of any kind without some loss of heat and it is a well-designed motor wherein the total number of heat units lost does not exceed 65 per cent. The greater part of this loss is carried off through the cylinder walls and the balance through the exhaust. Therefore, it must be understood that the good designer must strive to convert as much of this heat into work as possible. It will thus be seen tbat the slower the movement of the piston the greater the loss of heat through the cylinder walls and the less the power from a given size cylinder and from a given amount of fuel. From this it should be quite clear that all the advantages are with the long-stroke motor, not only from a standpoint of power, but from a standpoint of fuel consumption, and that the slower the motor must run the more pronounced are these advantages.

Fifth: The initial impulse is less in the long-stroke motor than in the short-stroke of the same horsepower because of the smaller area of the piston. In other words, the initial impulse of a 4x4 is approximately the same as a 4-inch bore and 5-inch stroke, hence if you build a motor of the same horsepower as the 4x5 and make the bore equal to the stroke you must necessarily have a greater pressure on the end of the piston at the time of ignition. This means that for a motor of the same power it is impossible to build one of the short stroke that will operate as smoothly as one of the long stroke.

Some one may say that if it is a good thing to build the motor 4x5 instead of 4x4 why not go still further and make it 4x6 or 4x7. Right here is where the distinction must be made between a motor running at a given speed and one running at all speeds, as is required in motor-car construction. I have heretofore tried to show why it is impossible to carry it out as far as can be done with a motor wherein the question of power and economy alone is to be considered. The great range of speed must be taken into consideration as well as the ratio of gearing and the general construction of the car.

Were I designing a motor for racing only the ratio of the stroke to the bore would not be the same as one I would design for a general use car. Again, if I were designing a motor to be run at a constant speed, the ratio of bore to stroke would conform to neither, but would be designed to secure the best results at that speed. Hence, in increasing the stroke of the motor for general car use I do not contend that it can be carried to the extent that all other points of car construction are of secondary consideration to the question of power and economy, but I do claim that the designer who is unable to retain all the flexibility of the very best cars of the latest development and at the same time use a motor wherein the stroke is one-quarter greater than the bore is not doing justice to at least some parts of the machine.

SOCIETY OF AUTOMOBILE ENGINEERS' FOURTH ANNUAL

TUESDAY, January 5, has been set as the date of the first session of the fourth annual meeting of the Society of Automobile Engineers, and in accordance with the program outlined by the local committee, the members will assemble at the Automobile Club of America in Fifty-fourth street, near Eighth avenue, at 10 a.m. on that date. The entire forenoon will be devoted to tests of different cars to be selected later by the committee, on the club dynamometer, these tests being carried out under the supervision of Henry Souther, a member of the society and the head of the technical committee of the Automobile Club. Following this there will be the usual business meeting and a technical session during the afternoon, the subjects to be discussed being the "Economics of Weight Reduction," by F. D. Howe; "The Factor of Reliability in Ignition Apparatus," by A. Atwater Kent; "Requirements of Automobile Brake Construction," by Thomas J. Fay and Lawrence Whitcomb. Immediately following the conclusion of the reading and discussion of the papers in question the meeting will adjourn for the annual dinner given by the society. This will be held at the Automobile Club. After the dinner the meeting will adjourn to Tuesday, January 19.

The purpose of this second session is to enable members from distant points who will only be in New York for one or the other of the automobile shows to attend the meeting. The clubhouse of the Automobile Club of America will again be the meeting point and the hour will be the same, 10 a.m. A similar series of tests will be carried out on various cars during the morning, while the subjects on which papers have been prepared for the afternoon session are as follows:

"An Improved Type of Compression Coupling," by W. S. Noyes.

"Standardizing Automobile Motor Bearings," by S. P. Wetherill, Jr.

"Some Practical Considerations in Autogenous Welding," by Henry Cave.

"Continuous Form of Engine Indicator," by S. W. Rushmore and H. L. Towle.

This part of the program is not arbitrary, however, and should it be found more convenient to arrange for the presentation of the papers in a different order this will be done. On the occasion of the second session, Tuesday, January 19, only the forenoon will be spent at the Automobile Club of America, the members adjourning to the Engineering Societies building, 29 West Thirty-ninth street, near Fifth avenue, upon the completion of the tests on the A. C. A. dynamometer. The technical sessions will be held in one of the meeting rooms in the latter building and immediately following their close the members will adjourn to the Engineers' Club, directly back of the Engineering Societies building on Fortieth street, where the annual dinner given by the Society will be held. From present indications it appears certain that the attendance will be the largest that the Society has ever had.

The past year has marked the greatest growth in the membership of the Society since its inception, the number of members having been more than doubled in that time. The plan of holding quarterly meetings in various cities of the country, which was inaugurated last year for the first time, having been found so successful it will be continued, instead of the previous custom of meeting semi-annually. In accordance with this plan. the first quarterly meeting for 1909 will be held in Boston during the course of the show there, while the fourth annual summer meeting will take place in some city of the Middle West. As Detroit and Cleveland were places of meeting during the past year, this will probably be Indianapolis, owing to the importance of the latter city as a center of automobile manufacture, in addition to its vast accessory making interests.

NOW SEVERAL TIRES ON A SINGLE RIM

By W. F. BRADLEY.

PARIS, Dec. 17.—Automobile touring in comfortable, closed cars, such as are becoming more and more common on European roads, seemed likely to be limited by the inability of tires to carry very heavy loads with any reasonable degree of safety. The largest and strongest tires now on the market, with a section of 135 millimeters, cannot be given a load of more

Showing the Michelin Twin Tires When Dismounted.

than 1,600 pounds if a reasonable length of service is required. A load of 1,600 pounds per wheel gives about 1 ton 4 hundred weight per axle as the heaviest load which should be carried on pneumatic tires. It is true that many powerful closed touring cars, fitted with all the luxuries that human ingenuity can devise, have a rear axle load of about 4,000 pounds. But such a load is only carried at enormous cost in tire up-keep, for the generally accepted rule is that the life of a tire is in inverse proportion to the cube of the weight which it carries. Thus, if the weight is doubled, the wear will, on an average, be eight times greater. An increase in weight of but 5 per cent. causes an increase in the wear of the tires of about 14 per cent.

The natural conclusion is that weight should be kept as low as possible in the construction or fitting of a car; or if such luxuries as heavy handsomely upholstered closed bodies, electric light, folding tables, self-starters, tire inflators, dismountable rims and the wealth of accessories which have been showered on the automobile, if all these are deemed indispensable, the user of them must be prepared to face a heavy tire bill, for it is weight that kills.

It is with the view of making possible the carrying of heavy loads on pneumatic tires that the plan has been brought forth of mounting two, three or four tires on one rim. Two or three attempts in this direction were shown at the Paris Salon, the most conspicuous being presented by Vinet and Michelin. Even more important than the case of the costly pleasure car is that of the commercial vehicle, for it has been proved that the excessive vibration set up with steel or solid rubber tires, where fast running is necessary, is ruinous to mechanism.

European commercial vehicle competitions have all proved the wheels and suspension to be the weak points of automobiles carrying loads of more than two tons. As long as the speed is kept reasonably low not much harm is done, but too many drivers are not content with a maximum of 15 miles an hour on steel tires, with the result that the car goes to pieces long before it should have done. There is an example in the Paris omnibuses, which are mounted on solid rubber block tires and are run at as high a rate of speed as possible over roughly paved streets, often being made to compete in speed with the subway trains. The result is that out of a fleet of 162 it is never possible to have more than 97 in service, the remaining 65 being in the repair shop and requiring the attendance of about 200 mechanics and fitters. One of the Paris taxicab companies, which in 1902 started out with cabs having steel-shod wheels, had an average of 7 per cent. broken crankshafts a year; the proportion on pneumatic tires was 1-2 per cent.

It is believed, therefore, that if such commercial vehicles as are obliged to maintain a speed of 15 miles an hour or more could be fitted with pneumatic tires in place of solid rubber or steel rims, there would be a considerable lengthening of the life of the vehicles by reason of the lessened vibration. Naturally, in the case of heavy trucks, with loads of six to eight tons, and required to maintain an average speed of six or seven miles an hour, there is nothing to be gained by an attempt to fit pneumatic tires. The advantage, however, is indisputable for passenger 'buses and delivery vehicles carrying an axle load of from 1,000 to 3,000 pounds.

How the Michelin Twin Tires Look on the One Rim.

The twin and triple tires produced by Michelin, and now being given a public demonstration on a Paris omnibus, were only made possible by the advent of the dismountable rim. If the inside one of a set of three or four tires on one rim required changing on the road, it is easy to see that the old system of wrenching each shoe over the fixed rims would not appeal to the passengers in the bus or to the shareholders of the

company. The dismountable rim was therefore indispensable. Where intended to be used in sets of two or more on a vehicle that does not exceed on an average a speed of 15 or 16 miles an hour, it was possible to strengthen the tire in a way that would not appeal to the fast traveling tourist, but which was excellent for the utilitarian vehicle.

The dismountable rim used on the Michelin consists, like the racing rim, of one fixed rim on the felloe of the wheel, and a split dismountable, the two ends of which are drawn together to bind it on the wheel. On the racing and ordinary touring models this binding is obtained by a turnbuckle—a system that has proved its worth in races on condition that the rim is screwed up as tightly as possible; some French drivers forgot this at Dieppe, and suffered in consequence. On the twin and triple tires there are two flattened portions of the fixed rim, one of these being pierced to receive the valve and bearing also a couple of stops corresponding with similar stops on the dismountable rim, the objects of which are to prevent creeping and facilitate mounting.

Palmer Blowout Preventer Shown at the Paris Salon.

Through the other flattened portion is passed a hardened steel stud, bored to take a bolt, and itself secured in position on the face of the rim in just the same way as a security bolt. A "T" wedge fits on this flattened face, and between the two rims, the stem end of the "T" screwing into the stud just mentioned, and the two arms of the "T" forming wedges, each engaging with a steel stud riveted onto the inner face of the dismountable rim, at each side of the split. The further the wedge is screwed in the closer the two ends of the rim are brought together, and the tighter the whole is bound on the wheel. To dismount the rims the outer wedge is first withdrawn, and a pair of forceps employed to force the two ends apart sufficiently to allow the rim to be lifted off. The projecting stud is taken off and the second tire treated in the same way. The operation is naturally longer than with the racing rim, but it should not occupy, under ordinary working conditions, more than ten minutes to dismount all three rims from a triple tire.

After tests extending over two years—the delay in placing on the market was principally on account of the dismountable rim—it is declared that two or three tires working side by side last from three to seven times longer than a single tire, with an equal load, working alone. The Paris 'bus now in service with these rims has three tires on each of the back rims and two on the front wheels. The weight of the vehicle, with eleven passengers, driver and conductor on board, is about 8,000 pounds. The 'bus is of a special type, with an armchair for each passenger and luxurious fittings.

SOME BRITISH AUTO DOINGS.

LONDON, Dec. 17.—The membership list of the Royal Automobile Club has just reached the 4,000 mark, a figure not approached by any other automobile club in the world. The number of the official gazette which gives this information also shows that the club's declaration of war against the inconsiderate driver is being acted upon. Legal proceedings have been taken in two cases of dangerous driving.

The differences between the Royal Automobile Club and the more democratic Motor Union are still unsettled and each body is seeking the support of the provincial clubs. A large number of these, however, have decided to associate with the two head organizations conjointly, or else not at all, and this evidence of opinion will probably lead to a peaceful settlement.

Three years ago much stir was caused by the announcement that the manufacturers of the Mercedes cars were about to institute proceedings against all Britisb makers whose cars were fitted with gate change. The general opinion was that the German firm had a strong legal case, and hence it was somewhat surprising to find that the matter was allowed to drop. Now it is stated that immediate action is to be taken, and the probable result will be that, with the exception of the Daimler Company, who hold a separate valid patent for their gate change, all British makers will pay royalty.

Newton, that prince of Brooklands drivers, has decided to retire from the racing game at the end of the year, but before then he is anxious to place tbe two 90-horsepower records at a figure far above their present level. Several times lately be has got the big Napier *Samson* up to a 120 m.p.h. gait for the half-mile, and it is possible that as much as another 10 miles an hour may be added, given favorable weather conditions.

The unnecessary use of big acetylene lights on city streets has of late become a grave public nuisance. The London authorities have made the first move by entirely prohibiting the lighting of headlights within the city, and other municipalities are likely to follow suit. Many devices have been tried to obviate the excessive upward glare from these lamps, but none have attained popularity. To encourage improvement in this direction the Royal Automobile Club is organizing a competition of headlights and of anti-dazzle attachments, the date being fixed for early in the new year.

BRITISH MAKERS FAIL TO SEE IT.

LONDON, Dec. 10.—Lending support to the rumor that there will be no Paris show in 1909, the Chambre Syndicale has made a definite proposal to the Society of Motor Manufacturers and Traders that if the latter will agree not to hold the Olympia show next year the French likewise will not have an exhibition. This suggestion is regarded rather with amusement by the leading British traders, who see no possible reason why they should cut off an undoubted source of business merely to oblige their Continental rivals. A second suggestion, that the Paris and British shows should alternate year by year, has met with no better reception, and hence it is definitely fixed that Olympia shall again open its doors next November.

SALT LAKE TO HAVE A MOTORWAY.

SALT LAKE CITY, UTAH, Dec. 21.—Leases have been signed for the right of way of the new automobile speedway from this city to Saltair, Utah. This will be built by a stock company and backed by the Salt Lake Automobile Club. The boulevard, which will be 25 feet wide and over 12 miles long, will cost, according to the promoters, no less than $50,000. The sources of revenue will be a small fee charged for the use of the boulevard, but the larger item will be the race meets, at which it is proposed to hold straightaway contests of one, five, and ten miles, all of the famous racing machines being expected. A modern grandstand will be erected just outside of Saltair at the end of the 12-mile straightaway.

PROPOSED LAW RESULT OF GOVERNORS' CONFERENCE

BOSTON, Dec. 21.—Acting in accordance with the suggestions made at the recent conference in this city of the governors of the New England States, the Massachusetts Highway Commission has drafted and reported to Governor Guild a new automobile law suitable for adoption by all the New England States. One of the things brought most prominently to the front in the conference of governors was the necessity of uniformity in dealing with automobilists, and in making up this bill the commission has studied the existing laws of nearly all the States, taking from each such things as seemed desirable for a uniform law, and also including some new features, whicb the experience of the commission in dealing with automobilists the past five years has shown to be advantageous. It is probable that the bill as drafted will be offered before the Massachusetts Legislature as a substitute for the present automobile law, and it will also be offered before the legislatures of the other five New England States. Numerous changes are made in the existing law, some of tbem being intended to increase the rights and privileges of automobilists, wbile others are restrictive in character.

One of tbe most notable of the changes proposed is to increase the maximum speed limit from twenty to twenty-five miles an hour in the open country. Twenty miles is the legal limit in Massachusetts, but some of the other States have twenty-five miles as a limit. It was felt by the commission that with proper safeguards as to reckless driving and the proper enforcement of these provisions the limit could safely be raised to twenty-five miles. But whereas under the Massachusetts law speeding in excess of twenty miles is prima facie evidence of improper driving, under the new draft speeding in excess of twenty-five miles will be conclusive evidence. The new draft also increases the limit in thickly settled sections, making this fifteen miles an hour instead of twelve as formerly. Speeding in excess of fifteen miles in thickly settled sections is to be prima facie evidence of improper driving. The limit at corners, curves and intersecting ways, including entering ways, is kept at eight miles an hour.

The draft provides for the elimination of local speed regulations, including those passed by park boards. Local authorities and park boards may make such local regulations, but they will not be valid unless approved by the Highway Commission, and the automobilists will not be under the necessity of taking the initiative in bringing such local regulations to the attention of the commission by filing a protest. It is provided in the law that, although speed in excess of twenty-five miles an hour is conclusive evidence of improper driving, a court may place cases on file whenever in its opinion the offence was unintentional or it is shown that nobody could be injured.

This change in the speed limit is a great concession to the automobilists, but they are to be made to pay for their privileges if the proposed law is adopted. Registration fees are to be based on horsepower, and the horsepower is to be determined by tbe authorities in charge of automobiles in each state. The proposed scale of fees is $5 for cars under 10 horsepower, $10 for cars of 10 and under 20 horsepower, $15 for cars of 20 and under 30 horsepower, $20 for cars of 30 and under 40 horsepower, $25 for cars of 40 and under 50 horsepower, and $30 for cars of 50 horsepower and over. Motorcycles are to pay $2 and commercial vehicles $5. How the Massachusetts Highway Commission would determine the horsepower, whether by actual measurements or by catalogue specifications, is not stated.

Another increased charge on the automobilist in the proposed law is an annual renewal of operators' certificates. At present in Massachusetts private operators' certificates are not renewed from year to year, though the annual registration system prevails.

For the second offence of driving while intoxicated the new law proposes a penalty of six months' imprisonment, while minimum fines are established for the ordinary offences, $10 for the first offence, $25 for the second and $50 for the third, within the same period of twelve months. Driving cars for racing or on a bet or wager of any kind is specifically prohibited.

It is proposed to make some important changes in the law as applied to non-residents. In Massachusetts non-resident owners may now drive their cars for seven days without securing a Massachusetts registration certificate. The new law proposes to extend this period to ten days and to allow chauffeurs as well as owners to drive cars during that period. But people whose home is in other States, and who live in Massachusetts or any other New England State for three months or more in a year, must register in Massachusetts and can secure a certificate for half price. This is intended to cover the cases of Summer residents.

Private operators' licenses will not be issued to persons under 16 years of age and chauffeurs' licenses to persons under 18 years of age. Further, nobody can operate who is under 16 years of age, even when accompanied by a chauffeur.

It is provided that all persons receiving compensation in connection with automobiles, such as salesmen, repairmen and the like, shall be considered as chauffeurs. Every car over 10 horsepower must have double sets of brakes, and when the car is standing the motor must be stopped.

The requirement for numbers on the side lamps is dropped, but a new requirement is made that the rear registration number shall be illuminated. Persons who rent cars are considered as dealers, this including presumably taximeter cab companies, and they may have uniform number plates. In every garage it is required that a record be kept of the entrance and exit of every car, and the word garage is defined to include club and private garages where fees are charged, as well as public garages.

QUAKERS EXPECT TO SEE A CHANGED JERSEY LAW

PHILADELPHIA, Dec. 21.—Quaker City autoists are looking for a revamping of the Frelinghuysen law at the coming session of the New Jersey Legislature. Not only have the long-continued plaints of the seashore bonifaces had their effect on the legislators, who are ready and willing to make the required changes, but even Motor Vehicle Commissioner Smith gives evidence of a change of heart. Of course, that official has had to carry out the law as it is on the books, but to many he has seemed a trifle overzealous at times. Now the Commissioner is out with a suggestion that everybody who desires a bettering of the lot of the automobilist who tours—or would like to tour—in New Jersey should hold a conference and decide on what amendments will be necessary to bring about improvement.

Mr. Smith admits that the Frelinghuysen law isn't the best ever, but thinks some allowance should be made for the legislators, who have been tinkering with the railroad laws for over half a century and haven't evolved an ideal yet, whereas they have wrestled with the automobile problem but five short years, and they cannot be expected in that short time to have learned it all. At any rate, they have learned something from this year's experience, when tens of thousands of dollars have been lost to the State's hotelkeepers and tradesmen through the practical boycotting of New Jersey by the automobilists, and now there are evidences of a willingness on their part to not only emasculate the Frelinghuysen law of the bulk of its harshnesses, but to make amends for the past derelictions by putting a law on the statute books which will make a veritable autoists' promised land of the erstwhile inhospitable "Garden State."

THE AUTOMOBILE

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THE STEADY GROWTH OF AN INDUSTRY.

In two recent issues we have published no less than twenty-one notes of commercial cars in nineteen different cities of fifteen State and two foreign countries. These have included the whole range of commercial cars, taxicabs, trucks, tractors, railway motor cars, passenger buses, police, fire, ambulances, school, board of health, board of public safety and public works service.

We mention these figures taken at random for the purpose of emphasizing the fact that this gradual movement or undercurrent is international and universal rather than local or sectional. To recall our statistics given above, we may make the additional statement that no less than eight of these are in the nature of repeat orders after an extended and eminently satisfactory test of a previous utility car, and in every other case but one it is a case of one installation being modeled after a successful one in another city, which when analyzed also assumes the aspect of a repeat order.

From the foregoing we are perfectly safe in the statement that the commercial car is gaining ground all over the world and for every purpose. The rapid advance in motor propelled fire apparatus may be mentioned as particularly worthy of notice. This particular branch has made most unusual progress, partly on its merits and in a small part from the scarcity and consequently high price of suitable fire horses. And horses are subject to ailments that are many and varied.

And yet this branch of the industry, and the commercial vehicle industry as a whole, is only in its infancy. Manufacturers of pleasure cars in this country the coming year will reach the 65,000 mark, but we doubt if the whole commercial car output for the coming year will be 5 per cent. of this figure, and if we except cabs, the figures will probably not run as high as 3 per cent. Whereas in the future there is no reason why the figure may not go up to 70 per cent. of the number of pleasure cars, while the latter then will have increased say to 125,000. This means for the commercial industry an increase of no less than 3,100 per cent., which spread over a period of five years would be an increase of 100 per cent. each year. How many of our commercial manufacturers are prepared to double their facilities and consequently their output each of the next five years? Similarly how many of our pleasure car manufacturers are prepared to get their share of this great wonderful increase, as compared with the pleasure car increase of about 92 per cent. total or a little over 13 per cent each year?

* * *

NOW A BASIC PATENT IN DUAL IGNITION.

Basic patents so broad as to be the basis of a monopoly are, fortunately, very scarce, the statement of which fact does not mean to infer that the inventor of a device should not be protected and afforded the just reward that merit indicates. A basic patent affords the means honestly to demand merit; in other words, dollars. There is a difference between a basic patent and a belated "broad" patent. The "Selden" patent to many has had the air of a belated patent, and the courts are still trying to decide its scope in the light of basic principles.

The "Apperson" dual ignition patent, in conjunction with the "Canda" patent of earlier vintage, may, in some measure at any rate, create something of a furor. If it can be shown that the inventor did invent, rather than to take advantage of the absence of earlier applications for "letters patent" current with advances in the state of art, then it is plain to be seen that the inventor should be allowed to spend the product of his brilliancy and what of energy the situation demanded.

On the other hand, there is something abhorrent in the plan that allows a broad patent to go to issue years after the device has become a common expedient, through its common use on dozens of different designs of automobiles or what not. True, the inventor should not be allowed to suffer if the delay is due to inactivity in the patent office, and at the same time the cause of the delay should be ascertained, if possible.

The extent to which the ignition patents under discussion will prove akin to basic principles, is a matter that can not well be foreshadowed in view of the uncertainty of the rulings of courts, as the records bearing upon the subject will adequately prove. In general, it is the case that the inventor is entitled to his claims and the good that may come of them, if they are not contested; the cost of contesting can be more than the royalty that fairness might reasonably demand.

ONLY ONE AMERICAN CONCERN SEEKS TARIFF REDUCTION

WASHINGTON, D. C., Dec. 21.—In the concluding minutes of his appearance before the Ways and Means committee, which at present is occupied with the subject of the tariff, John J. Carton, attorney for the Buick Automobile Company, last week unwittingly explained the attitude of the company, for which he made a plea for the reduction of the duty on automobiles. Representative Boutelle, by reference to former testimony, asked if the Buick company did not intend to start a factory abroad. The question failed to elicit a direct response, though it is a well-known fact in the automobile industry that Buick cars are being manufactured at Oshawa, Ontario, by the McLaughlin Motor Car Company, Ltd., which is understood to have a direct connection with the Buick company at Flint, Mich.

Commenting upon Mr. Carton's unsatisfactory answer, Mr. Boutell remarked: "If this is a fact, it will explain much that is now a mystery. It will explain why you wish a lower protection on an American product, as you are going to become a foreign manufacturer."

"It is unlikely," replied Mr. Carton, "that we are arguing against our own business. We have a factory in Michigan, and it doesn't seem probable that we would try to hurt its business in order to help our possible activities abroad in the future. Besides, I don't know about that foreign factory with certainty."

Previously Mr. Carton had said: "From my talks with the general manager of our company, W. C. Durant, I desire to state to the committee that we are occupying somewhat of a middle ground. We differ from those who want a 45 or 60 per cent. tariff, and we also differ from those who do not want any tariff. The company which I represent, and for whom I speak, is of the opinion that there should be a moderate tariff placed upon the importation of automobiles, somewhat from 20 to 25 per cent. The general manager of our company is of the opinion that a 25 per cent. ad valorem tariff would be a sufficient tariff to take care of the automobile industry and to give it proper protection in this country.

"Now, it is a fact that the Buick Automobile Company is to-day selling automobiles in Europe and selling them there in competition with the automobiles manufactured there, and selling them successfully. Of course, at the present time they are not manufacturing an automobile which, in the common acceptation of the term, is as high grade as some of the other factories, but Mr. Durant said to me in a conversation the other day, and authorized me to say it here, that next year they will turn out as high-grade automobiles as any factory in the country—as good an automobile as can be made—and that they will sell it at 70 per cent. of the price which is now being charged for the same grade of automobiles by the so-called high-grade factories.

"Now, improvements are constantly being made, and the business of the manufacture of automobiles is being reduced more and more to a science every day, and there is, in the opinion of the gentlemen I represent, very little to fear from foreign importations. Of course, there should be something on it to make the difference—to take care of the difference—in labor."

Chairman Payne asked Mr. Carton if he thought 20 or 25 per cent. would make up the difference between the cost of labor here and abroad, to which the latter replied: "Yes, taking everything into consideration. That is what I am advised." Chairman Payne then wanted to know why the motor car was not a pretty good thing to produce revenue upon. Mr. Carton replied: "Well, yes; the question is whether you will produce more revenue with a 45 or 60 per cent. duty than you will with a 20 or 25 per cent. duty." Mr. Payne said it would seem at first sight that the automobile was a sort of luxury that could well afford to contribute to the revenues of the government, to which Mr. Carton replied that the automobile as a luxury was fast passing out of that stage.

Representative Crumpacker wanted to know how Mr. Carton, as a manufacturer, would be interested in having the tariff reduced on automobiles; in a word, what effect it would have. Mr. Carton thought it would be better for the trade generally by and by. Judge Crumpacker then wanted to know how, in the future, a reduction of tariff would improve business in this country. Mr. Carton replied that he did not know that it would improve the business, but he and his associates did not think it was necessary to have a high tariff on automobiles. "If the tariff were reduced from 45 per cent. to 25 per cent., in order to obtain the same revenue, we would have to import about twice as many automobiles as we have before, and that would displace an equal number of the American make?" asked Representative Crumpacker. Mr. Carton replied it might be so considered. Judge Crumpacker said he asked the questions because he had not been able to understand the interest the Buick people had in the manufacture of automobiles in the reduction of the duty from 45 per cent. to 20 or 25 per cent. To this Mr. Carton said: "Well, I am presenting the views of the managers of the company. They are of that opinion. We are protectionists, so far as that is concerned, and we think that there should be sufficient to compensate for the difference in the wage scale. But outside of that there isn't any reason why an automobile could not be made here, considering the skill and workmanship of the American manufacturers and the American workingmen, cheaper than they are made in Europe."

Representative Dalzell asked about the Selden patent. Mr. Carton replied: "We are not paying any license fee. We have concluded that the Selden patent does not mean anything."

"That is all right," said Representative Dalzell, "but you have been paying?"

"Yes," replied Mr. Carton, "but we have declined for a year or more now to recognize it."

It was then that Representative Boutell said he could not understand why the Buick concern went to the expense of sending somebody down to Washington to make an argument for the lessening of the duties. It seemed, he said, more or less of a mystery to him.

Mr. Durant Evaded the Question.

WASHINGTON, D. C., Dec. 21.—The Ways and Means Committee gave a hearing Saturday to W. C. Durant, of the Buick Motor Company, and the following excerpts from his testimony are of interest:

"Mr. Carton, our attorney, appeared before the committee some days ago at my request, because it was impossible for me to present the case. He stated the case as best he could with the limited knowledge possessed by him, having been called upon to help me out of a difficulty, and I had a conversation of about two hours with him, attempting to express my views. I wish to correct some of the statements made by Mr. Carton, fearing that the committee may be laboring under a misapprehension.

"The Buick Motor Company has been accused of being interested in the reduction of the tariff by reason of owning a factory in Canada. I wish to say that the Buick Motor Company does not own or control a factory in Canada, but has a very slight interest in an institution in Canada. That concern last year, as I understood, employed a capital of $65,000. They produced 197 automobiles. It has been represented that the fact that we are interested in a small way in that Canadian plant is operating against the statements which we are now making, and which we hope might enable the committee to give us a reasonably fair tariff bill."

Mr. Durant submitted certain figures bearing on the direct cost of labor in the manufacture of an automobile, and got into a wrangle with the committee over the figures.

He was asked the direct question if his company contemplated erecting a factory abroad, but evaded the question by saying that his company was after foreign trade.

A BUDGET OF LATE NEWS FROM TIRETOWN

AKRON, O., Dec. 21.—The Mansfield Rubber Company, of Mansfield, 65 miles west of Akron, has been organized by F. A. Wilcox, of this city, with $250,000 capital stock. Mr. Wilcox has been elected president, and the other officers are the following: Vice-president, C. H. Walters, Buffalo; secretary, F. W. Walters, Buffalo; treasurer, F. M. Bushnell, Mansfield; directors, F. A. Wilcox, C. H. Walters, F. W. Walters, L. Hautzenroeder, F. M. Bushnell, H. Homberger, W. H. Bissman. The company will manufacture especially the National tire tube, but will be devoted entire to turning out high-grade pneumatic tires and casings and a full line of molded and mechanical rubber goods. The plant is to be installed by January 10 with a complete equipment, which is to include a Harris-Corliss engine of 550 horsepower, with four boilers of 200 horsepower. By March 1 the plant is to be in operation, and forty experienced rubber men, some from here, will go to Mansfield. By next Fall it is expected 250 persons will be employed.

Mr. Wilcox is a director of the Pennsylvania Rubber Company at Jeannette, Pa., and he and C. H. Walters were the early managers of this same company when located at Erie. Messrs. Walters were connected with the Victor Rubber Company for years, and Mr. Wilcox organized the India Rubber Company, of this city, which he managed until it sold out to the trust.

Tire Town Has a Little Auto Show.

The Akron Auto Garage Company, A. Auble, Jr., and F. C. Wood, managers, gave a very successful automobile show this week, representatives of five auto manufacturers and of numerous accessory concerns being present. This is the second show of the kind given here, and interests the entire trade of the city. One of the most interesting features was an aeroplane model exhibited by Fred T. Childs, a local machinist, whose flying machine moved about at the will of the operator easily. Childs expects to construct a full-sized aeroplane next Spring. It will weigh about 600 pounds and will be equipped with a 25-horsepower engine weighing only 110 pounds. It will carry its wings in such way that the inventor claims such an accident as occurred to the Wright machine will be avoided.

At this show Winton, Oldsmobile, Franklin, Baker Electric, Peerless and Buick cars were shown in 1909 types, and two of the Webb auto fire trucks were also shown. All of the Akron manufacturers of accessories were well represented with exhibits. Several Eastern companies bad representatives present.

International Harvester Has New Air Cooler.

The International Harvester Company has completed a test car and is now ready to turn out a new style of air-cooled automobile with four-cylinder engine and tourabout body, which will constitute a roadster much larger and more imposing than the ones now manufactured at the rate of ten a day here. The test car has already been put through hard work, one continuous run of 35 miles bringing the engine through in the best of shape, with the air-cooling apparatus working perfectly, there being no sign of heated parts. The engine will have a heavy horsepower. While it is to be something on the order of the famous Franklin engine, the designer expects it to be more powerful. In connection with it Mr. Johnston, the designer, has invented a starting mechanism for explosive engines also.

Motz to Extend Its Operations.

The Motz Clincher Tire & Rubber Company, of this city, is preparing to extend its business very materially. Recently the company sold $15,000 worth of treasury stock, bought principally by the stockholders, and the money will be used to extend the company's operations. Branches are to be established in Chicago and New York after the February sbows. P. E. Bertsch will have charge of the New York branch. The company is also talking of establishing a plant, the Buckeye Rubber Company now producing its tires. The lines to be extended especially are motor buggy and other vehicle tires, as well as solid truck, cushion, and special electric tires.

Firestone Employees Organize Benefit Body.

The Firestone Tire & Rubber Company employees in the factory and office have organized a society known as the Firestone Mutual Benefit Association, for which a charter will be asked soon. It will have several hundred members to start off with, and the purpose is to provide sick and death benefits for the members and to cultivate social ties. The opening function is to be a large dance in the top floor of the new addition to the south wing of the factory.

OLDS WORKS BECOME JERSEY CORPORATION.

LANSING, Mich., Dec. 21.—Notice to local stockholders in the Olds Motor Works to the effect that they may exchange their holdings in the latter company for shares of the General Motors Company, on the basis of $4 in preferred and $1 in common of the new company, for each share of the Olds stock, is the first intimation received here that the Olds Company has been transformed into a New Jersey corporation with a capital of $12,500,000, of which $7,000,000 is in the shape of 7 per cent. cumulative preferred shares, while the remainder is common. It is said that an offer was made for 75 per cent. of the Olds Motor Works stock, but was not considered by a majority of the holders, unless the proposal were made to include the entire issue so that all stockholders would have an equal opportunity to exchange on the same basis.

The interests back of the new corporation have acquired control of 75 per cent. of the outstanding stock of the company and will accordingly be in a position to elect new officers and directors, but otherwise there will be no change. No formal transfer of the property will be made, and the corporation will continue the business as heretofore, except that it is said to be the intention of the new interests to greatly enlarge the business. It could not be learned whether there are any other Michigan automobile interests involved or not.

NEW OFFICERS FOR POPE COMPANY.

HARTFORD, Conn., Dec. 21.—A meeting of the directors of the reorganized Pope Manufacturing Company was held in New York City Friday, and the following officers were elected: Chairman of the board of directors, Harry Bronner; president, A. L. Pope; vice-president, Charles E. Walker; treasurer, Colonel George Pope; secretary, Wilbur C. Walker; assistant treasurer, Ezra M. Cutting; counsel, Joline, Larkin, and Rathbone.

The new company has authority to take over the properties of the company on the payment of the debts of the old concern and the transaction of this is being accomplisbed with all possible dispatch; the new concern is practically running under its old officers. A petition of the receivers of the old company will be filed in the court of chancery at Newark for permission to make the final payment of the fourth dividend.

C. O. SACKS NOW PRESIDENT ROWLAND AGENCY.

Clarence O. Sacks, for a number of years associated with the late John B. Rowland, in the Rowland Advertising Agency, has become president and treasurer of that concern. Eugene F. Kinkade, who represents a New Jersey district in Congress and is president of the New Jersey Street Car Advertising Company, of Newark, is secretary and a director of the Rowland Agency.

OUTLOOK FOR LARGE CAR VIEWED IN CLEVELAND

CLEVELAND, Dec. 21.—Developments in the automobile field during the past half year have not only followed one another rapidly, but have been of such a nature as to give rise to numerous questions of interest concerning what the future may hold in the way of bringing forth new types, or rather of definitely setting the seal of approval on certain types and sizes of cars. Not the least interesting of these has to do with the size of the car; in other words, what is to be the outcome of the "Large Car vs. the Small," and what influence will the trend of the demand during what is now generally conceded to hold forth promise of being far and away the best year the industry has ever experienced, have upon the settlement of this question? With a view to obtaining the opinions of some of those directly concerned, the representative of THE AUTOMOBILE called upon some of Cleveland's leading manufacturers. It will be evident upon reviewing the manner in which they have placed themselves upon record, particularly when taken in connection with the unprecedented amount of business they now have on hand, that the call for high-priced and high-powered machines has never been greater and that there is little likelihood of this phase of the demand for automobiles undergoing any decided change for some time to come. The discussion of this question by Cleveland manufacturers is particularly apropos, as Cleveland has always been a center devoted almost exclusively to the production of machines of the better class.

Alexander Winton, of the Winton Motor Carriage Company, thought there would always be sufficient demand for cars of large power and seating capacity to make it worth while for leading manufacturers to list such a type. "Not that I think there will always be a call for large machines simply on account of their size, as I feel convinced that the day when people were fond of running around with a big seven-passenger touring car, regardless of the requirements of their families, is gone by. Vacant seats in a car have too long been regarded as a standing invitation to one's friends, who would otherwise not be included in a party, and the average owner of a car has long since realized that carrying extra weight around means increased fuel and tire bills. Of course there is a certain legitimate demand for large cars with big bodies, but for every man who has to invest in a seven-passenger car to accommodate the seating requirements of his family, there are ten or twenty whose limit is three or four, so that not a few of our 60-horsepower six-cylinder machines will be fitted as roadsters or with a small tonneau.

"Probably we are not in as good a position to discuss the relative demand for cars of the two sizes as some other makers, as the 48-horsepower six-cylinder Winton was on the market for a whole season before we listed the 60-horsepower size, and naturally our orders for the former are very largely in excess of the calls for the higher-powered car, but even at this early day we have had a very gratifying demand for the big car, and the number of inquiries received by our agencies in different parts of the country goes to show that a very fair percentage of our season's output will be 60-horsepower cars. Many of these will naturally be closed types, such as the limousine and landaulet, and where it is necessary to carry a number of people such as only one of these machines will accommodate comfortably, there is nothing else that solves the problem quite so well. Just what percentage of our total output will consist of the 60-horsepower type it is difficult to predict now."

Walter White, of the White Company, thought it a hard matter to say at the present moment just how the demand would shape itself in the next few months where the two sizes of White steamers that are now being turned out are concerned. "Having come out with the announcement of the 20-horsepower White early in the season, we have naturally had to devote considerable attention to its manufacture," said Mr. White when seen at his office, "and have already produced a series of these cars, which are now being delivered as rapidly as is possible.

"It strikes me that the real question, at least so far as we are concerned, is not so much what sizes of cars to turn out as how to be able to turn out more of them. That is the situation that now confronts us, and it applies more particularly to the large car than to the new White of less power. When it comes to a shifting of the demand in either direction, our facilities are such that we will be in a position to take care of our orders one way or the other, and the same thing applies to the total number of cars that we will build during the season, as we have always found that no matter what our plans made at the beginning of the season happened to call for, we were compelled to exceed the original number to a greater or less extent. Judging from the present outlook, the prospects are that this will be the case next Spring."

George J. Dunham, president of the newly reorganized Royal Company, now known as the Royal Tourist Car Company, was enthusiastic over the outlook for a high-grade car along similar lines to those of present standard models, but of smaller dimensions, and doubtless Mr. Dunham's long agency experience in Boston makes him better qualified to speak on the subject than the average manufacturer, as he has been in direct touch with the purchaser for several years.

George J. Dunham.

"That is my opinion on the subject," said Mr. Dunham, "but so far as we are concerned here at the factory, it will probably be a long time before we are in a position to devote any attention to a new model, other than the one which Mr. Jardine has been perfecting during the last year or two and which we will now begin to turn out in quantities. There couldn't have been a better time to perfect the reorganization of the company, though we would naturally have been in a better position to make deliveries had it come about earlier."

F. B. Stearns, of F. B. Stearns & Company, was confident that there would never come a time when those American makers who had achieved a reputation for their product in the past several years, would find it difficult to sell all the large cars they could make. "Regarding the small car question," said Mr. Stearns, "that depends entirely upon what you mean by a 'small car.' We have added what we call a small shaft-driven car to the Stearns line, but compared with what is usually regarded as coming within this category, it is really a large car, but not as powerful a machine as the regular Stearns, on which we are giving an option of chain or shaft drive, though we prefer the former for a big car designed to run at high speeds over all kinds of roads. But the motor of Stearns small car shows 40 horsepower on the test block, and, when equipped with a baby tonneau, of which we are turning out a number, it will also be capable of traveling at high speed, at the same time having all the enduring qualities of the bigger machine. It is practically a smaller edition of the big Stearns with a shaft drive and naturally handles easier in congested traffic, thus making it particularly suited for town work when used with a closed body.

"Things could scarcely be better," continued Mr. Stearns, speaking of the outlook. "By October 1 we surpassed our entire 1908, production, and that month of this year ran several times ahead of the same month a year ago. We planned to build 250 cars last year, and, when the slump came, cut that figure to 200, but there was so little actual falling off in the demand that we built and delivered 243 of the 30-60 Stearns before the end of the season. This year we have made preparations to double that figure by planning to turn out 500 cars, but at the present rate there is every prospect of our running considerably over that."

DETROIT ENTHUSIASTIC ABOUT SHOW.

DETROIT, Dec. 21.—Allotment of space for the forthcoming show under the auspices of Detroit Auto Dealers' Association, proves conclusively the accuracy of the statement made earlier in the season that it would be the best ever. Every bit of available space on both floors of the huge Wayne Pavilion, where the show will open February 15, lasting one week, was snapped up by those anxious to participate in the exhibition. Sixteen of those who drew were members of the Detroit Auto Dealers' Association, all large auto concerns. Of the twenty-one non-members some were automobile companies, some motorcycle agents, and some accessory manufacturers and agents.

The latter were the innocent cause of some caustic interchanges of correspondence between "Dada" officials and officers of the Motor and Accessory Manufacturers. At the annual meeting last summer the latter body voted not to take any part hereafter in local automobile shows because of the heavy traveling expenses. Local shows in this resolution were defined as all those save New York, Chicago, and Boston. Failure to sanction the local show was taken by "Dada" officials as an attempt to hamper them, which they promptly resented. Now that the true situation has been made known, peace once more reigns.

FIRST CHAUFFEUR CONVICTED IN MARYLAND.

BALTIMORE, Dec. 21.—The first arrest to come under the law making it a misdemeanor for chauffeurs to take out the cars of owners without their consent, was that of James L. Hild, employed by President Oscar G. Murray, of the Baltimore & Ohio Railroad Company. Hild was fined $100 and costs, making a total of $101.45, while his chauffeur license within this State was suspended for three months. Hild had previously been fined $25 and costs on a charge of exceeding the speed limit of 12 miles an hour. Hild took the machine, a Packard car, and a party of friends for a "joy ride," early on Sunday morning, December 13. While speeding out Charles street avenue boulevard the car was dashed into a telegraph pole and one of the occupants, Harry Kessler, was killed and the machine wrecked. The coroner's jury decided that Kessler's death was accidental, and exonerated Hild of any criminal charge, but he was compelled to pay the fines on the other two charges. The Automobile Club of Maryland, at a specially called meeting, condemned Hild's conduct, while the State Automobile Commission has determined to embody a severe penalty for reckless driving in the proposed bill to be presented to the next State Legislature.

BUFFALO TRADESMEN ELECT JAYNES.

BUFFALO, Dec. 21.—W. C. Jaynes, of the Automobile Supply Company, has been elected president of the Buffalo Automobile Trade Association. This step is said by insiders to have averted an open rupture with the Automobile Club of Buffalo. It was recently announced that a faction of the trade association, if elected, would promote a show in opposition to the automobile club show. The defeat of this faction at the polls by Jaynes, known as the "peacemaker," puts an end to the talk. The other officers elected were: Vice-president, Maxwell-Briscoe-Buffalo Company; treasurer, Brunn Carriage Mfg. Co.; secretary, Dai H. Lewis; executive committee, George N. Pierce Company, E. R. Thomas Motor Company and G. H. Poppenberg.

LUXURIOUS STAGE FOR SOCIETY FOLKS.

LAKEWOOD, N. J., Dec. 21.—The latest innovation is one intended for the society people who visit this resort. This is the installation of a luxuriously appointed automobile stage or motor 'bus to run from the Hotel Knickerbocker, in New York City, to this resort. The roads are among the best and the scenery en route is very beautiful and picturesque, so that the elegantly appointed vehicle will doubtless be well filled each day. This mode of travel is increasing in popularity daily.

DETROIT'S TAXICAB INTRODUCTORY.

DETROIT, Dec. 21.—Now it is the taxicab that has fallen under the ban. When the first of these buzzabouts appeared on Detroit's streets they were regarded with curiosity by the old-time cabbies, who for so long had a monopoly of the passenger business. In quick succession came distrust, apprehension, alarm. Now the cabbies are panic-stricken. You can't get one of them to admit this. The fact remains, however, that they have united to compel the taxicabs to operate under the ordinance governing the rates of fare to be charged, and in this manner hope to check the rapid inroads made on their business.

The cabbies have long enjoyed the privilege of having their conveyances stand about the city hall waiting for passengers. The taxicabs have the consent of hotel and café proprietors to stand outside their establishments and skim off the cream of the business, hence the trouble. As a matter of fact, the taxicab fare by the hour is cheaper than that charged by the cabbies. It is only on the short haul that the latter's rates are more reasonable.

A suit to determine the status of the taxicab and discover whether it is amenable to the existing ordinance has been instituted by Police Commissioner Smith, and the outcome is breathlessly awaited by local Jehus.

Literally Overland in an Overland Car.
Frank Moore, manager of the Fisher Automobile Company, Indianapolis, driving his Overland roadster up one of the steepest bluffs in the neighborhood of that city.

AUTO MAIL COLLECTING IN INDIANAPOLIS.

INDIANAPOLIS, IND., Dec. 21.—The local post office last week placed in service two gasoline cars for the collection of mail and the cars are to be run to all parts of the city.

The cars in use were built by the Overland Automobile Company and will be leased by the post office for one year as an experiment. After that time if the test is successful all of the mail collection work in the city will be done with automobiles.

Bodies enclosed with heavy screen wire and canvas as a protection from the cold are mounted on the regular chassis of Model No. 32 Overland. The cars are painted red, white and blue, after the style of the horse-drawn mail wagons. There are two of the automobiles and so far have given excellent service. Drivers are supplied by the Overland Automobile Company, a carrier accompanying each car.

PROVED ECONOMY OF AUTO OVER HORSE.

PHILADELPHIA, Dec. 21.—The Oxford Automobile Company, local agent for the Brush car, gave a very convincing demonstration of the workings of the Brush package-delivery wagon last Saturday, when a route of 101 stops was covered in 2 hours 39 minutes, as against the best previous 5 hours 14 minutes with a horse-drawn team. At $600 this little wonder figures out as a sure economical proposition, especially in rush times like the Christmas holidays.

News in General

Speedwell Rapid Delivery Truck—a Successful Commercial Car.

This car is designed to carry a load of 3,500 pounds, although some of them have successfully carried as high as 5,000 pounds in an emergency. The chassis, including the driver's seat, is so built that any type of body can be mounted thereon. The makers, the Speedwell Motor Car Company, Dayton, O., report a heavy demand.

Weights of Accessories, Tools, Etc.—The subject of weights and weight distribution has of late come to be a very interesting one. Beginning with the practice of some makers of suspending the body between the axles to get the proper distribution of weights, we may look into the matter of accessory weights. It is a fact that the average automobile owner cannot tell how the weight of his car is distributed. A table prepared by the George N. Pierce Company, of Buffalo, gives a close insight into this matter, so far as Pierce-Arrow cars are concerned. The Pierce-Arrows are equipped very completely, and what is known as the "stock car" has with its equipment, not generally included, these articles: Shock absorbers, 28 pounds; odometer and fittings, 2 pounds; foot rest, 7 pounds; robe rail and brackets, 5 pounds; dash cabinets, 3 pounds; luggage carrier, 17 pounds; tool box, 26 pounds; sprag, 12 pounds; rubber bumpers, 5 pounds; rear axle straps, 2 pounds; gasoline gauge, 1 pound; tools and spare parts, 55 pounds. Aside from the actual mechanism and body of the car there are extras, such as cape top, 138 pounds, and the glass front, 44 pounds, that count in the weight of the car. Water, oil, gasoline and grease add another 220 pounds. The ignition outfit of a Pierce-Arrow adds more weight. Two separate systems are used, a high-tension magneto and storage batteries. The magneto system weighs 32 pounds, and the battery system 70 pounds. Then the lamps, lamp brackets and horn weigh 87 pounds. This added gives a total of 738 pounds over and above the mechanism and body of the car.

Does Reo Get the Record or Not?—An interesting discussion has sprung up between an Eastern and a far Western crowd of automobile enthusiasts relative to a certain record. The question under discussion is: Did Leon T. Shettler win the world's non-stop record run in Los Angeles last March? Shettler's rivals concede that the 4.992 miles which his Reo covered in the sleet and slush around Los Angeles lowered the previous non-stop record by 86 miles. It is alleged that he confined his run principally to the city streets, whereas his rivals covered the roads around Bridgeport, Conn. Thus, it is alleged to be a non-stop world's record, while the other is a non-stop world's record road run, which is splitting it very fine. Shettler says: "As far as running the Reo over the streets is concerned, fully half the distance was on country roads. We started out to run over the streets of Los Angeles, but they were in such bad condition that we took to the roads. If we had done so in the first place, we would have added about 50 miles a day to the record." There is enough merit in either stunt to justify a medal being awarded to both cars.

Oil Your Bearings.—Autoists who have all ball-bearing cars, or cars well equipped with ball or roller bearings, should use oil freely, according to one well-known maker of both. "There is a false impression prevalent that ball and roller bearings do not require oil, but this is incorrect, as they need it not only to prevent rust, due to moisture from condensation or other causes, but they also require it as a lubricant, although a comparatively small amount is consumed," says S. S. Eveland, president of the Standard Roller Bearing Company. "It has been found desirable to use a heavy non-fluid oil or grease, free from animal fat or foreign substance, or a good machine oil fed under pressure, or have the bearings mounted in an oil bath."

Demand for an All-Around Car.—There still exists a big demand for an all-around-the-year car, one that will have lots of power with the touring body on, and yet drive slowly and easily when the summer body has been replaced by the limousine. Commenting on this, James Joyce, president of the American Locomotive Company, says: "We have something out of the ordinary to meet this demand for the all-around machine. This is our 40-horsepower car, which is made with direct drive on the third, as well as the fourth, speed. With this car a man can get about the city on third speed, driving direct and throttle down to the necessary pace, and yet run silently and with no straining of the gears, much the same as with a car of lower horsepower."

Maxwell Agent Challenges.—The Maxwell agent at Hartford, Conn., R. D. Britton, has issued a challenge to any car costing less than $1,000 for a race in mid-winter from Hartford to Pittsfield, Mass., and return. The distance is 154 miles, and includes some of the worst roads in New England, with many hill climbs, one of which reaches an elevation of 1,500 feet. Mr. Britton has entered two Maxwells, the only conditions being that the race be held within a few weeks; cars must be owned and driven by Hartford residents, and must go the distance under their own power. The Hartford *Times* will offer a cup if any one accepts Britton's sporty proposition.

Self-Starting Devices.—Although few new self-starting devices have been brought out lately, considerable interest is being manifested all over the world. One of the simpler American arrangements consists simply of a clutch and spring attached to the magneto armature, allowing the latter to be spun around. A famous French manufacturer has paid Alexander Winton the high compliment of imitating the Winton device. However, in order to avoid infringement, the French device accomplishes its purpose by a roundabout rather than a direct method, hence the foreign self-starter lacks the Winton's simplicity.

Lists a 90-Horsepower Racer.—That speed races help the companies building high-powered cars is shown by the fact that immediately after the recent Savannah races no less than five prominent autoists tried to buy the 90-horsepower Simplex car that made such a good showing. This the manufacturers, Palmer & Singer Manufacturing Company, New York City, refused to sell, but took orders for duplicates and now are building ten of these Savannah models, which will be equipped with bucket seats, large fuel tank and generally resemble the Savannah car. A guarantee of 90 miles per hour goes with every car.

Doubled the Capacity.—Nearly every day sees the announcement of a new factory or a new building for automobile factories. That the accessory makers are not idle is shown by the fact that one maker alone, the Edmunds & Jones Manufacturing Company, of Detroit, Mich., has built an immense addition that will increase its capacity to five times that of last year. Despite this great increase the factory is running night and day, having on hand orders for 60,000 pairs of oil lamps and 40,000 pairs of gas lamps.

St. Joe Company to Move.—The St. Joe Motor Car Company, of Elkhart, Ind., has fully decided to move to Hutchison, Kan. While no bonus is promised the firm, it is understood that Hutchison capitalists will invest $50,000, thus raising the amount of capital stock from $50,000 to $100,000. The name will be changed to the Sunflower Motor Car Company, and plans have been made for producing 300 cars each year.

Bendix Will Go to Logansport.—It is understood that the Bendix Automobile Comnany, of Chicago, Vincent Bendix president, and the Logansport, Ind., stockholders have arrived at an agreement whereby the company will remove to that town, starting work immediately on a new building. This company, it will be remembered, holds the patents on the Bendix friction transmission.

Will Manufacture Transmissions.—The General Manufacturing Company, of Elkhart, Ind., of which D. E. MacCarthy is president and treasurer, has established and will manufacture a standard line of auto parts, starting with cone clutches and selective type of transmissions. They will also bring out two sizes of planetary transmissions for use on lower priced cars.

IN AND ABOUT THE AGENCIES.

Cameron, New York City.—The Cameron Motor Company, of New York, will occupy with its general sales offices the entire building at 231 West Fifty-fourth street, January 1, 1909, in charge of Harry W. Doherty as manager. The factories at Beverly, Mass., and New London, Conn., are planning to turn out 2,000 of the air-cooled Cameron "fours" and "sixes" in runabouts, baby tonneaus and racers, and will shortly add to these models a taxicab and light delivery car.

Waverley Electric and Gyroscope, Chicago.—The S. H. Peterson Automobile Company, Chicago, have taken up quarters at 1229 Michigan avenue, where they will represent the Waverley electric and Gyroscope. Mr. Peterson, formerly with the Woods Motor Vehicle Company, has surroundcd himself with an able staff of technical men and salesmen in anticipation of a big year's business, particularly in the new models of the Waverley electric.

Stevens-Duryea, Philadelphia.—A. G. Spalding & Bros., Philadelphia agents of the Stevens-Duryea, have taken a lease of the old quarters of the Maxwell and Mora agents—the Kelsey Motor Car Company—at 202-204 North Broad street, and after a thorough overhauling, which is now in progress, will abandon their present salesrooms at 510 North Broad street. Manager F. W. Eveland thinks the change can be made in about three weeks.

More Franklin Agencies.—The Franklin will be handled the coming season by these dealers: Florence, S. C., Brown & Ingman; Montgomery, Ala., Capital City Automobile Company; Comanche, Tex., L. B. Russell, Jr.; Corsicana, Tex., Corsicana Motor Company; El Paso, Tex., P. L. Abel Cycle Company; Ispeming, Mich., E. R. Nelson; Easton, Pa., Easton Automobile Company; Elizabeth, N. J., Elizabeth Automobile Company, Inc.

Portland, Ore., Agent Increases Facilities.—H. M. Corey, of Portland, Ore., agent for the Pierce Arrow and Cadillac, has recently taken a new building 100 by 100 and two stories high, the salesroom of which set a new high mark in elegance for that part of the country. This is finished in antique with oak-stained beam ceiling, dull-brass drop lights, very sumptuous offices and waiting rooms.

An Active Pennsylvania Concern.—The Sunbury Automobile Company will handle the Locomobile, Matheson, Mercedes, Pope-Hartford and Studebaker electrics at Sunbury, Pa. This vigorous young company also plans to manufacture a car of its own, a new factory building, 60 by 150, three stories high, being under construction.

Speedwell, New York City.—Broadway's automobile row will gain one more agency January 1, when the Speedwell Motor Car Company, of Dayton, O., opens its New York City branch at 2002 Broadway. This will be a distributing house for the eastern section of the country.

Bosch, New York City.—The Bosch Magneto Company announces removal to its new building at 223-225 West Forty-sixth street, New York City. This change was necessitated by steadily increasing business, which made the old quarters inadequate.

Waverley Electric, Indianapolis, Ind.—The Hearsey-Willis Company, Indianapolis, is closing out the carriage business and will devote its entire attention to automobile trade. The company has added the Waverley electric agency to its list.

Middleby, Newark, N. J.—The Middleby Automobile Company, of New Jersey, has taken the Newark agency for the Middleby, a new four-cylinder air-cooled car manufactured in the old Duryea plant in Reading, Pa.

Mercedes, San Francisco.—W. E. Travis, whose headquarters are with the Pioneer Automobile Company, San Francisco, will personally have the Western agency for Mercedes cars.

Mitchell, Media, Pa.—Penn Motor Car Company, of Philadelphia, has opened a branch house at Media, Pa., from which the southeastern corner of the State will be supplied with Mitchells.

Premier, Southern California.—The newly formed Schwaebe-Atkinson Motor Company, of Los Angeles, Cal., will have the Southern California agency for the Premier car.

Regal, San Francisco.—Daniel E. Whitman, the well-known San Francisco agent for the Rambler, has added the Regal to his line.

PERSONAL TRADE MENTION.

Victor M. Gunderson, ex-secretary, treasurer and general manager of the Northern Motor Car Company, who resigned when the consolidation of that company with the Everett-Metzger-Flanders Company took effect, has decided to take a well-earned vacation and will spend the winter touring Mexico, Florida, Cuba and Puerto Rico. Mr. Gunderson has been in the automobile business since its earliest days. He was elected secretary and treasurer of the Northern Motor Car Company in September, 1903, when the output of the Northern Motor Car Company had only reached a total of three machines in six months. Under his management the "Northern" developed a car of high efficiency and the business to a point where it was considered one of the powerful factors in the industry. The Northern Motor Car Company was organized with a capital stock of $20,000, and under Mr. Gunderson's management developed and grew until it had a paid-in capital stock of $385,000 and had paid substantial annual dividends. Mr. Gunderson has not made any definite plans for the future.

Victor M. Gunderson.

H. K. Sheridan, who has driven the White steamer to victory in a number of important reliability runs, has accepted an offer from Manager George W. Bennett to become superintendent of the New York branch, and he will hereafter be in charge of the garage and repair shop. Mr. Sheridan has for several years held an important position at the White factory in Cleveland, and he is exceptionally well qualified to direct the affairs of the garage on West End avenue, "the largest in the world devoted to a single make of car."

George Patterson has been appointed manager for the newly established Rambler branch in Cleveland, which supersedes the agency for that car formerly held by T. C. Whitcomb. Mr. Patterson is one of the best known and most popular of the Cleveland dealers, and was for the past three years agent for the Reo and Premier in that city, which agency will be continued under new management, but with the same staff as before.

David Henry is the sales manager of the Inter-State Automobile Company, Muncie, Ind., which position he has occupied for the past two months. It was erroneously stated in these pages last week that Mr. Henry was sales manager of the Auto Parts Mfg. Company, Muncie, Ind.

C. A. Newman has become manager for Guy E. Blackwelder, Franklin dealer at Oklahoma City, Okla. Mr. Newman was formerly with the Atwood Automobile Company, Toledo, and the Sid Black Automobile Company, of Cincinnati, O.

Robert W. Blake, formerly manager of the Knox branch house in Philadelphia, has joined the sales force of the E. L. French, the Quaker City Pullman agent.

R. K. Swett, formerly with the Pope-Hartford Company, is now with the H. H. Franklin Manufacturing Company as a salesman.

N. J. Eisenberg has joined the sales force of Brock's garage, Trenton, N. J., which has the Winton agency.

OBITUARY.

Arthur W. Tobin, president of the Continental Motor Works, of Muskegon, Mich., died recently in Chicago of blood-poisoning, following an operation to remove a growth of bone in the nose. Mr. Tobin was born in Chicago and only removed to Muskegon three years ago, but had built up a very large and flourishing business in that time.

BUSINESS DIFFICULTIES.

Toledo, O.—J. W. Lane, trustee in bankruptcy of the Craig-Toledo Motor Company, Toledo, O., has filed suit against the stockholders to recover $30,000 with which to pay the debts of the defunct concern in full. Lane alleges that the debts aggregate over $45,000, while the assets produced but $16,000, and asks that the court collect unpaid stock subscriptions to pay the balance. He further alleges that when the firm was formed $51,000 stock was issued to one of the promoters for the assets of the Maumee Motor Car Works, worth not more than $1,500.

RECENT INCORPORATIONS.

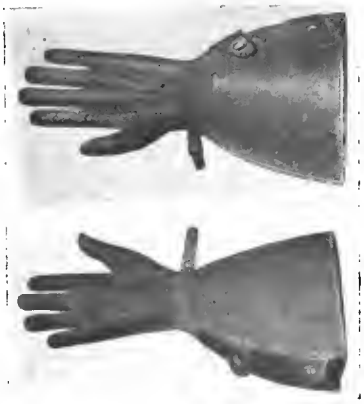
Hyle Spring Hub Company, Buffalo, N. Y., capital $150,000, to manufacture motors, engines, machinery, cars, carriages, boats and motor vehicles. Among those interested are: W. A. Hyle and Blum Yates, Ellicott Square, Buffalo; V. E. Peckham, Jamestown, N. Y.

Dubred Machinery Company, New York City, will deal in automobiles and knitting machines. Capital $5,000. Incorporators: P. E. Dubred, Convent Switzerland; P. A. C. Dien, J. B. Bruyn, New York, and Henry Escher, Jr., Brooklyn.

Sharp Arrow Automobile Company, Trenton, N. J., capital $125,000, to manufacture automobile and vehicle engines and machines. Incorporated by W. H. Sharp, F. J. Sharp, J. R. Farlee, I. W. Burnett and A. M. Yetter.

INFORMATION FOR AUTO USERS.

Price Automobile Gloves.—In the manufacture of this line of automobile gloves, two views of which are shown in the illustrations, the maker, the Henry W. Price Company, Rockford, Ill., has produced something classy and distinctive that appeals to the practical autoist in point of style, comfort and wearing qualities. The graceful lines of these gloves, together with the care that marks their finish, not only makes them particularly dressy, but at the same time contributes to their comfort and serviceability. Among the exclusive features of this line of gloves is the great length, the large and wide gauntlet cuffs with wide folding gore and clasps a solid leather wrist strap with snap strap buckle, and inseams throughout the base of the thumb. These gloves are made throughout, even to the cuff linings, from the best quality of selected washable horsehide, no cape or sheepskin being used in them, and the makers state that they put them up as carefully as though they intended to wear them themselves. A copy of illustrated catalogue describing the line can be obtained by addressing the Henry W. Price Company, Department 25, Rockford, Ill.



FRONT AND BACK VIEWS PRICE GLOVE.

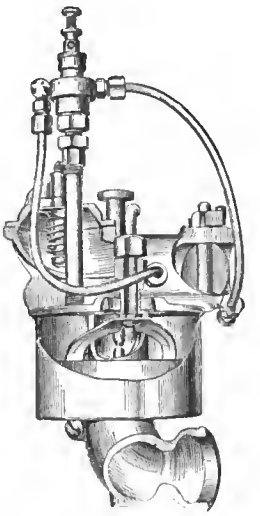
Pressure Indicator for Tires.—The recent interest in tire pressure adduced by a long and careful series of English experiments on this subject has perhaps paved the way for some small compact form of pressure indicator. The tests of several large sizes showed, for instance, that of two similar sets of 36 x 5 rear tires one at 95 pounds' pressure gave exactly twice the mileage of the one carrying 60 pounds. As the average autoist this pressure is only necessary, but a neat, compact and medium-priced little indicator recently put on the market by the Brown Company, Syracuse, N. Y., will rapidly change this guesswork to an absolute certainty.

BROWN TIRE PRESSURE INDICATOR.

This little instrument shown in the cut may be carried in the pocket and slipped on the tire valve whenever it is necessary or advisable to read the pressure. This company recommends the following tire pressures, which autoists desirous of obtaining full mileage from their tires should maintain at all times:

Size of Tires.	Pressure in Front.	Pressure in Rear.
3½ inches	60 pounds	65 pounds
4 "	65 "	70 "
4½ "	75 "	80 "
5 "	80 "	90 "
5½ "	90 "	95 "

A Practical Fuel Economizer.—The tendency of to-day from large toward small-sized cars, which is manifested by a large number of buyers, is mainly a matter of economy on the part of the owner of the car, this manifesting itself largely in a desire to economize on fuel. This may be accomplished to a great extent by the attachment of a fuel economizer to the carbureter. The G-L Economizer, which is illustrated in the drawing, is an air controller, and is designed to give the motor the right mixture at all speeds. By its use it is claimed the user of an automobile can save at least 25 per cent. of gasoline, and have the horsepower increased. The economizer accomplishes its work by converting the atmospheric pressure in the float chamber into a partial vacuum, which is controlled by the speed or load of the engine, and is therefore automatic. It can be attached to all carbureters that have a float and throttle. The G.-L. Economizer Company, Times Building, New York City, is the general distributer to the trade and public.

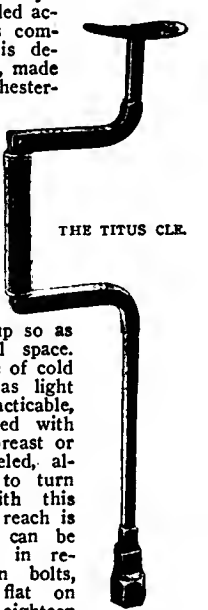


THE G-L ECONOMIZER APPLIED.

V-Shaped Leather Belting.—This belting is made on a different principle from the usual article of this character. It consists of four layers of leather one-eighth inch in thickness, securely bolted together with copper rivets, set seven-eighths of an inch apart. It is accurately beveled on both edges into the V-shaped form, and is specially adapted for automobile fan belts and for motorcycle belting. The maker, the American Belting and Tanning Company, with tannery at Princeton, Mass., and offices and factory at 135 Oliver street, Boston, lays great emphasis upon the properties of pliability possessed by this belting (the illustration showing this characteristic to a nicety), its great strength and resistance to heat, oil and mosture. The company is a large producer of leathers for mechanical purposes and this new belting is the result of much experience and careful experimenting.

SHOWING PLIABILITY OF BELTING.

A Folding Socket Wrench.—One of the newest and most convenient of auto tools consists of a bit and brace, the ordinary bits being replaced by a series of steel sockets for nuts graded according to the sizes commercially used. This describes the Titus Cle, made by the Quincy-Manchester-Sargent Company, Plainfield, N. J., and placed on the market by the Frank Mossberg Company, Attleboro, Mass., and the Factory Sales Corporation, Chicago, Ill.



THE TITUS CLE.

This wrench has the additional advantage of folding up so as to go into a small space. The sockets used are of cold drawn steel made as light and thin as is practicable, seven being furnished with each handle. The breast or hand plate is swiveled, allowing the handle to turn more readily. With this wrench a very long reach is obtained, one that can be used, for instance, in removing transmission bolts, etc., while lying flat on the floor, perhaps eighteen inches away. The Titus Cle promises to attain a wide popularity with autoists.

Speare's Zero Fluid.—The Alden Speare's Sons Company, 369 Atlantic avenue, Boston, makers of the well-known line of Speare's auto oils, make a special non-freezing compound, under a distinctive formula that for the past five years has stood the test of severe winter in thousands of cars. It is the proud claim of the makers that Zero fluid has never failed or caused a cent's worth of damage. It is put up in five and ten-gallon cans, and sold under an iron-clad guarantee.

The Unisparker.—This new accessory, the latest product of the Atwater Kent Manufacturing Works, North Sixth Street, Philadelphia, may best be described as a simplified form of the Atwater Kent Spark Generator. It is designed for use on cars

UNISPARKER WITH SIDE COVER REMOVED.

where the arrangement of the cam or magneto shafts make it inconvenient to install the spark generator, or where it is desired to use an outfit of somewhat lower cost. It consists of two separate units—a contact maker and distributer, adapted to go in place of the ordinary timer on any convenient half-time shaft, and a spark coil

SPARK COIL COMPLETE WITH SWITCH.

complete, with condenser and switch, adapted to go on the dashboard.

Current is derived from six or eight ordinary dry cells, a set of which will last from 1,500 to 2,000 miles in the average four-cylinder car. But one spark is produced per ignition, and the contact duration is as brief as will permit the coil to "build up," whether the engine speed be slow or high. The mechanism of the contact maker in the Unisparker is the same as in the spark generator, and most of the working parts are identical and interchangeable with those of the latter. There is no vibrator, and contact is made and broken at one point only.

The distributer casing is of hard rubber and is held by three screws. Four posts in the casing (or as many as there are cylinders) connect the spark plug cables. A central post receives the high-tension current from the coil and carries it to the distributer blade. This blade is carried by a hard rubber block removably mounted on the contact maker shaft. The coil box is mounted on the dashboard. It is of unusual size and efficiency. The condenser is enclosed with the coil, and the switch is mounted on the box. On closing the switch, snapping the lever to the left against a special contact permits the engine to be started on the spark when there is fresh gas in the cylinders. Access is ordinarily needed for but one thing: to adjust the contact screw once in about 500 miles. This screw is reached by taking off the side cover. To remove this cover it is only necessary to pull out the spring plug to which the positive wire from the coil is connected, and turn down the spring clip holding the cover. On removing the three screws holding the distributer, all parts are exposed. The Unisparker and coil is furnished for six, four, three and two-cylinder cars. For the last named, the switch is not self-starting. The prices range $50, $45, $45 and $35, respectively.

Bay State Autokit.—This new ratchet and socket wrench, made by the Tudor Manufacturing Company, of Taunton, Mass., is most complete in every detail, being regularly furnished with a reversible ratchet, extension shank, a universal drop-forged folding handle, 30 sockets, including spark plug socket; screwdriver and universal joint, all put in a very neat case. A

USING THE BAY STATE AUTOKIT.

chief characteristic of the ratchet is that it can be moved up and down the shank to any desired point, depending upon what part of the mechanism of the car it is desired to reach. It has extension shanks to give 18 inches complete length without any socket attached. The universal drop-forged steel handle folds neatly against the shank, or can be removed when replacing in the case. This particular handle will in most cases do away with the use of a universal joint, but to make the set complete as possible a universal joint is furnished. A new

APPLYING AUTOKIT EXTENSION SHANK.

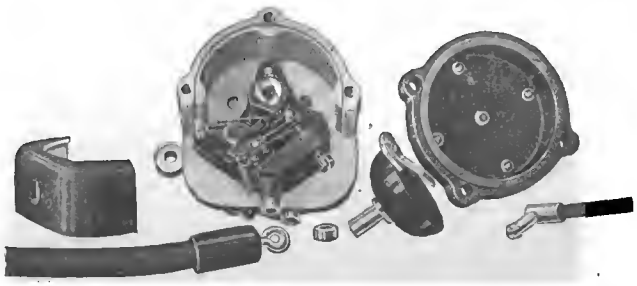
method employed for holding the sockets is the use of spring balls. The case itself is strong and attractive, with dull black outside finish and mahogany finish inside.

Heater for Closed Cars.—Coincident with the development and refinement of closed cars for comfortable winter touring comes a similar refinement of accessories for the same. Most of these are designed primarily for comfort and are therefore rapidly attaining popularity. Among these might be mentioned the Pele Heater, which utilizes the jacket water for warming the interim of the car, thus costing nothing to run or maintain after it has once been installed. This may be done by any mechanic in two hours' time and does not alter the construction or appearance of the car. Being made of aluminum, it is very light, weighing but ten pounds, and may be turned on or off at will. These are sold by the manufacturers, the Automobile Heater Company, 1133 Broadway, New York City, and Fort Dearborn Building, Chicago.

Brampton Motor Chain.—Charles E. Miller, the well-known manufacturer, jobber, exporter and importer, with headquarters at 97-101 Reade street, New York City, and branches in Philadelphia, Boston, Cleveland, Detroit, Buffalo and Brooklyn,

BRAMPTON CHAIN LINKS.

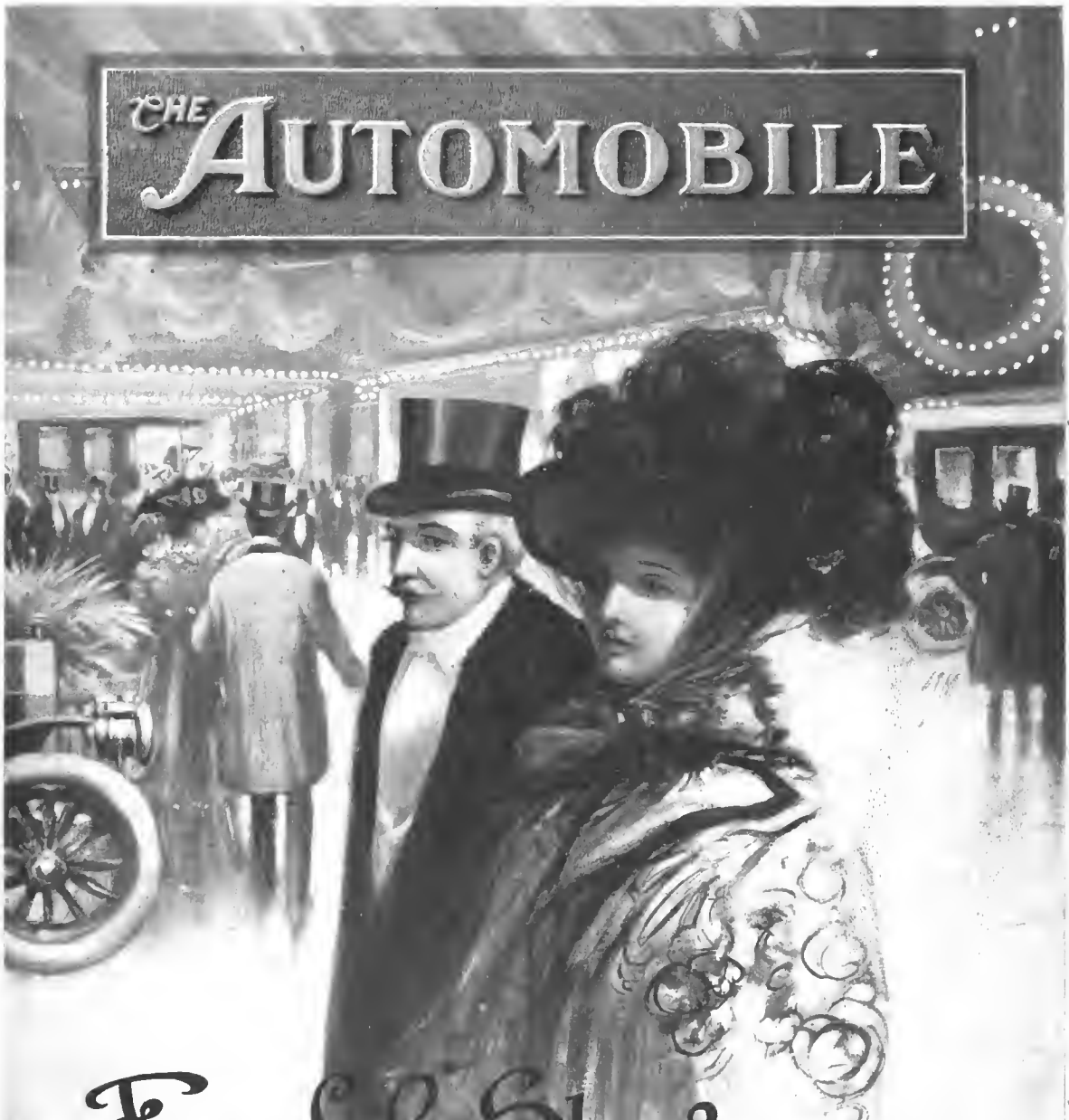
is the sole American agent for the Brampton chain, which has met with such pronounced success in this country. This chain, the form and construction of which is exemplified in the illustration, is made of self-hardening steel, with all parts polished, and will fit all properly cut sprockets without friction. Brampton Bros., the manufacturers, were established in 1832, and have been making chains for over a half century, a pretty good backing for the claims made for excellent quality and remarkable strength. All the Miller stores are prepared to furnish Brampton chains in all sizes upon demand.



DISTRIBUTER AND SIDE COVER REMOVED, SHOWING CONTACT MAKER.

VOL. XIX NEW YORK—THURSDAY, DECEMBER 31, 1908—CHICAGO No. 27

THE AUTOMOBILE



First of the Shows

Grand Central Palace

December 31st to January 7th

What the A. M. C. M. A. Offers

Motor and Accessory Manufacturers

Also the

Importers' Automobile Salon

THREE HUNDRED makers of automobiles and accessories allied thereto are represented in the Grand Central Palace on Lexington avenue, where the American Motor Car Manufacturers' Association is holding forth in exhibition in conjunction with the Motor and Accessory Manufacturers and the Importers' Automobile Salon. A few unattached help to fill the odd spaces. 'Tis a most impressive showing by an industry which a fortnight hence will utilize another building for another show in order to complete the evidence of its amazing and substantial growth.

This afternoon the elect had a "private view" of the "Ninth International Automobile Show"—so-called this year because of the presence of the importers, who, by their diminishing numbers, are illustrating the old saying about the "survival of the fittest." Very few of those invited could have declined, for the rejuvenated and beautified old Palace had an enormous throng soon after the doors were open. This denoted undisguised interest.

But to-night the crowd came, and when President McGowan, of the Board of Aldermen, officially opened the exhibition, the aisles were becoming congested, and later the building probably held the largest crowd in its history. It is expected that a hundred thousand people will have passed through the turnstiles before the show closes, a week from to-night.

When it is said that the lowest priced car is sold at $150, even though it be for the rising generation, and the highest priced vehicle is listed at $15,000, with the greatest variety of selection in between, it is apparent that this show should meet the wants of any class of buyers, even the most exacting.

The car exhibits are subdivided into 67 American, 14 foreign and 12 commercial, supplemented by 220 spaces occupied by accessory manufacturers.

Over 2,000 carriage dealers have received special invitations to attend, and a goodly number of them are already examining the automobile field, realizing that their own domain is gradually succumbing to the inevitable invasion of motor-driven vehicles.

Of course, there will be dealers from all over the country, and the National Retail Automobile Dealers' Association has headquarters in the Palace.

From cellar to roof the Palace was converted to the needs of an automobile show, and many difficulties were successfully met with in the thorough work that progressed with surprising rapidity. According to the story of the press representative, $30,000 have been expended in the decorations, which this time include the porte cochere and outside of the building. Jean Palelogue, well known in connection with automobile show art, has supplied some huge paintings which assist harmoniously in the interior embellishment, the racing scene possibly attracting the greatest amount of attention, for the public is ever fascinated by a scene of speed such as can be supplied by the modern distance chariots.

Naturally included in the cars exhibited are the Savannah big and little Grand Prize winners—the Fiat of Wagner and the Lancia of Hilliard. The cups are also displayed with undisguised pride by the possessing firms.

The decorative scheme is of an early English period, including statues of heroic size, some 9,000 incandescent lights, several searchlights and bevel-glass mirrors. Never before has the Palace been flooded with such a burst of electric brilliancy, and the result makes it appear strange and decidedly pleasing.

"Good art always costs money," said H. O. Smith, chairman of the show committee, previous to its opening, "and the best in the line of statuary, paintings and electrical equipment will be seen at the show in the Palace on the eve of the new year." What the chairman of the show committee said has been made good, and that the work has been in progress for several months can scarcely be doubted. The results tell a story without words.

Manager Reeves boasts of a most artistic office, fitted with Turkish draperies and it incidentally contains a cozy corner. L. M. Bradley, the assistant to the big little energetic man, has an office deluged in blue, while the press-room, several times the size of the former one, has red and white panels with a blue cornice, thus accentuating the national idea in colors. All around, the Palace has received the best dressing up that ever came to it through any one of the various exhibitions that have been housed in it since it bid for show favor.

It would appear from the opening attendance that the day of the automobile show in this country is some distance away, especially in the metropolis, whither there come from all over many thousands who consider it a treat to find the leading cars of the industry under one roof ready to be inspected and explained and purchased. Possibly shows may become unnecessary in many cities, but the value of exhibitions in New York City and Chicago, and possibly in Boston, is likely to continue of such worth that the manufacturers will hesitate and consider most carefully before deciding that the history of shows has been written.

Special nights are to be a part of the present show, the schedule calling for a Municipal night, a Merchant's night, an Engineers' night and a Military night. "Society" is to be specially catered to on Tuesday night next, and while its members have always had a predilection for the foreign car, the progress of the American maker has brought about serious inroads into the business of the importer. But a certain percentage of "Society" seems to be firm in foreign car liking, and undoubtedly will continue so to the end of the chapter.

The military orchestra of Fred W. Bent is supplying the music, and this includes an "International March," a two-step called "Around the Jericho Turnpike" and a gallop named "The Last Lap," with a waltz christened "The 1909 Model." The substitution of an orchestra in place of a noisy band seems to be one of the many excellent features embodied in this decidedly creditable exhibition arranged by the hard-working committee of the A.M.C.M.A., which has demonstrated that the makers did not need assistance from any other source whatever in order to insure what is certain to be a most successful week. Nowadays the public asks first to be pleased.

The Men Who Run The Show


BENJAMIN BRISCOE-CHAIRMAN AMCMA


ALFRED REEVES GENL MANAGER


R.M. OWEN


S.H MORA


E.R HOLLANDER-IMPORTERS DIV.


DAVID J. POST-M.&A.M.


H.O. SMITH CHAIRMAN SHOW COM

ALFRED REEVES thus interestingly tells how the "show" is made ready and run:

More than eight months of work, the time, attention and labor of some 4,000 men and the expenditure of thousands of dollars is required for the putting on of an automobile show like the Ninth International affair which opens in Grand Central Palace, New York, on New Year's Eve. Prior to the show some 400 workers devote all their time to the preparations, while during the affair not less than 200 employees are at their posts day and evening in the general caring for the public and exhibitors. Added to this are some 3,400 manufacturers and their employees on hand showing the very latest in the motoring world both as to American and foreign cars and accessories, including the captains of industry, the sales managers, salesmen, chauffeurs, demonstrators and those of other callings.

The art work required to properly stage the glittering, power-driven machines of modern life will cost something like $30,000 for the single week, being expended on decorations, electric lights, paintings, statues and the other features of the big exposition. Excepting the electrical equipment, all of this is practically useless after the show. It is all made possible by the tremendous and increasing interest in motoring and the motor car, evidenced best by the record-breaking attendance that always favor these affairs and which results in the valuable business returns to those showing their products.

As in former years, every inch of available room has been taken, there being something like 70,000 square feet of space allotted to exhibitors at the coming show, with a dozen or more firms on the waiting list. Added to all this is the record-breaking attendance of agents which is assured for this affair, a major portion of the 3,000 motor car agents and 2,200 leading carriage dealers of America being certain to view the 1909 offerings of the automobile tradesmen. As for the attendance of the general public, it is predicted that not less than 100,000 people will visit the Palace from the opening on New Year's Eve to the closing of the show on January 7.

There is really no great secret about the handling of a motor car show. It is the same old story of perfect organization, made a bit more difficult by the fact that plans for these affairs are somewhat of a temporary sort, hastily devised and the men trained quickly for their work, somewhat like artists are trained for a big stage production which has only a short time for rehearsals.

A clean-cut system must be in vogue for some months prior to the show to handle the preliminaries, and a most exacting one to look after the comfort of the exhibitors and visitors during the progress of the affair. Some nine months ago the first plans for the Ninth International Exposition in Grand Central Palace were laid, when Benjamin Briscoe, chairman of the American Motor Car Manufacturers' Association, appointed the show committee. The men selected as directors of the affair were H. O. Smith, chairman; R. M. Owen and S. H. Mora, with the addition of E. R. Hollander, representing the Importers' Automobile Salon, and D. J. Post, of the Motor and Accessory.

After surveying the Palace, diagrams were issued, contract and space applications prepared and the whole distributed throughout the automobile trade. This was followed by the plans for advertising, an essential part of an exhibition depending upon public support. Poster designs were submitted, the approved ones were printed and arrangements made for their distribution on bill boards within 50 miles of New York City Hall, many of the posters being illuminated by electric lights. Then followed the advertising in the daily newspapers and the automobile papers, running into many thousands of dollars, and the handling of the publicity end which supplies the news regarding the show plans.

Most important of all contracts made was the one for decorations, which in this case went to the S. R. Ball Company of New York, whose design was considered the most original and best adapted to the Palace and to motor cars.

The printing of thousands of pieces of stationery of all sorts, the arrangements for the shipping to New York of the products of 300 automobile and accessory factories and the printing of some 200,000 tickets of all styles came in for consideration.

Following the applications for space and the drawing and the signing of contracts, the matter of plans for the care of agents during the show had to be given consideration, together with the annual show luncheon and the meetings that are always on schedule during show week.

Some time prior to the show the regular departments for handling the affair were organized with a head to each, the whole being in charge of the general manager under the guidance of the show committee.

As the show must open on time, everything must be scheduled and carried out without delays of any moment. Four or five days before the show opens the Palace is turned over to an army of workmen who proceed to transform it in a manner that is astonishing to the layman. Included in this vast corp of help are carpenters, carpet layers, artists, drapers, sculptors, plaster workers, modelers, telephone operators, linemen, wiremen, furniture makers, brass workers, scene painters, ironworkers, telegraph operators, sign painters, freight handlers, shipping clerks, laborers, ushers, ground glass workers, floor polishers, silk hangers, banner makers and woodworkers.

For three or four days and nights the Palace is turned into a veritable beehive of industry, and to the layman it looks as though the show could never be ready on time. Order comes out of chaos, however, when the whistle blows for the opening for the private view, the cleaners quickly dispose of the debris and the public marches through the aisles with comparatively little knowledge of the accomplishments required to provide them with an exhibition of their favorite machines.

After the doors open the Palace becomes a city in itself, with a small army of employees who look after the public and exhibitors. The information bureau where out-of-town visitors and others ask for information, requires veritable human encyclopedias to supply. A complete telephone exchange is installed and begins work, wires going to almost every one of the 300 exhibitors, whose names are printed in a special telephone directory. Telegraph and telephone booths are opened up and thousands of pieces of mail matter are received daily. There is a day and night force of special police in uniform as well as plain clothes men, to keep the Palace clear of questionable characters. Then there are ticket sellers, ticket takers, counters, pages, watchers, demonstration chiefs and helpers, laborers, porters, electricians, program boys, cleaners, two chefs, waiters and watchmen. The band of 25 pieces under Professor Bent, plays pleasing music and the English Inn is ready to supply food and refreshments to the multitude.

The executive officers of the show, with its cashiers, bookkeepers, stenographers, department clerks and office boys, work religiously for the comfort of the exhibitors. The press department opens its doors, and almost 400 newspaper men from all quarters of the globe are on hand to write of the great exposition, sending their stories to the prominent daily, weekly and monthly publications of this country and Europe.

Sign painters, decorators and electricians are kept in attendance for the use of exhibitors who arrive late. The various parlors and lounging rooms are alive with maids and attendants, and the building is patrolled by firemen and special deputies to prevent smoking and maintain order.

The flashing lights, searchlights, the 9,000 pearl incandescent lamps, the low murmur of voices, the music of the stringed orchestra and the display of the glittering, life-like machines all supply a picturesque scene that has few equals from a spectacular point of view.

After a week that is strenuous for everyone identified with the show in any way, the band plays "Home Sweet Home," the cars shipped to new owners or to other shows, tons and tons of accessories are removed, the beautiful decorations are demolished and within twenty-four hours the exhibitors have scattered all over the country. Once again the big Palace is quiet and a big motoring public has seen the best automobiles of America and of Europe with their accessories in a setting that is commensurate with motoring as a sport, as a pastime and as an industry.

CONCERNING THE GROWTH OF AUTOMOBILE SHOWS

By H. O. SMITH, Chairman A. M. C. M. A. Show Committee.

NO better illustration can be cited to demonstrate the magnitude of the industry than the wonderful growth of automobile shows since their inception November 3-10, 1900, when the Automobile Club of America launched the first exhibition in Madison Square Garden. To the A. C. A. belongs the credit of fathering automobile exhibitions in this country. Little did this young automobile club realize what a huge oak their little show acorn would develop into.

That infant exhibition of but 69 exhibitors created in the automobile buying public the first desire to become a motorist. The public knew little then of automobiles, and had a varying faith in the "horseless carriage." The vehicles were crude affairs, propelled principally by steam and electricity.

The rapid development of the A. C. A.'s shows is now history, and only a glimpse at the number of exhibitors of past shows and the present one in the Grand Central Palace, under management of the American Motor Car Manufacturers' Association, with their exhibit list totaling 286, is needed to demonstrate the growing popularity of the automobile.

On December 2, 1901, the A. C. A. opened its second show with 92 exhibitors. There was no show in 1902, but each year since has seen successful exhibitions with the following schedule:

1903—Jan. 17-24.....	Madison Square Garden—	198 Exhibitors.
1904—Jan. 16-23.....	Madison Square Garden—	205 "
1905—Jan. 14-21.....	Madison Square Garden—	247 "
1906—Jan. 13-20.....	69th Regiment Armory—	218 "
1906—Dec. 1-8.....	Grand Central Palace—	216 "
1907—Oct. 24-31.....	Grand Central Palace—	257 "
1908-9—Dec. 31-Jan. 7..	Grand Central Palace—	286 "

Not only has the number of exhibitors increased from 69 to 286, but the attendance has been tremendous, which means that automobile shows are a necessity, and a great business-getting proposition for the exhibitors.

The manufacturers who exhibit meet practically every live dealer who go to the shows from the most remote parts of the country. Dealers meet the buying public, make new acquaintances and secure the names and addresses of those who are really interested and intend to purchase. All this can be accomplished in no other way at so small a cost.

Automobile shows have been the direct cause of changing many carriage dealers to the ranks of automobile distributers. Carriage dealers of every country are seeing the handwriting on the wall and the inevitable downfall of the horse. During the past season there has been a scramble among carriage dealers for an automobile agency.

Automobile shows are increasing in popularity and have become a fixture. The manufacturer, the dealer and the public all unite in the belief that automobile shows are imperative and should be continued. The automobile show has become such an important factor that it ranks with theaters in appealing to the masses. It has pushed the Horse Show into second position from a society standpoint, as is amply demonstrated by the reduction in demand and prices for Horse Show boxes at the recent horse exhibition in New York.

At no time in the history of automobile shows has there been so great a demand for space as this year at the Grand Central Palace show. If automobile shows did not well repay exhibitors, certainly there would not be such a demand for space.

At no time in the history of the automobile, has there been so much interest manifested in the annual show as this year. It has been fifteen months since the public have had an opportunity to attend an automobile exhibition and the attendance will unquestionably be tremendous.

That the automobile show in the Palace has become an important society event in New York is amply demonstrated by the fact that hotels and cafés have decorated for the occasion.

EXHIBITORS OF THE PALACE SHOW.

AMERICAN PLEASURE VEHICLES.

ACME—Acme Motor Car Co., Reading, Pa.
AMERICAN—American Motor Car Co., Indianapolis, Ind.
ALLEN-KINGSTON—Allen-Kingston Motor Car Co., Kingston, N.Y.
AMERICAN SIMPLEX—Simplex Motor Car Co., Mishawaka, Ind.
ANDERSON—Anderson Carriage Co., Anderson, Ind.
ATLAS—Atlas Motor Car Company, Springfield, Mass.
AUSTIN—Austin Automobile Co., Grand Rapids, Mich.
BENNER—Benner Motor Car Co., New York City.
BRUSH—Brush Runabout Co., Detroit, Mich.
CAMERON—Cameron Car Co., Beverly, Mass.
CARTERCAR—Motorcar Co., Pontiac, Mich.
CHADWICK—Chadwick Engineering Works, Pottstown, Pa.
COATES—Coates-Goshen Automobile Co., Goshen, N. Y.
CRAWFORD—Crawford Automobile Co., Hagerstown, Md.
DE LUXE—De Luxe Motor Car Co., Detroit, Mich.
FORD—Ford Motor Co., Detroit, Mich.
GAETH—Gaeth Automobile Co., Cleveland, O.
GYROSCOPE—Gyroscope Automobile Co., 231 W. 54th St., New York.
INTER-STATE—Inter-State Automobile Co., Muncie, Ind.
JACKSON—Jackson Automobile Co., Jackson, Mich.
KISSELKAR—Kissel Motor Car Co., Hartford, Wis.
LAMBERT—Buckeye Mfg. Co., Anderson, Ind.
LANE—Lane Motor Vehicle Co., Poughkeepsie, N. Y.
MARION—Marion Motor Car Co., Indianapolis, Ind.
MARMON—Nordyke & Marmon Co., Indianapolis, Ind.
MAXWELL—Maxwell-Briscoe Motor Co., Tarrytown, N. Y.
MIDDLEBY—Middleby Automobile Co., Reading, Pa.
MIDLAND—Midland Motor Co., Moline, Ill.
MITCHELL—Mitchell Motor Car Co., Racine, Wis.
MOLINE—Moline Automobile Co., East Moline, Ill.
MOON—Moon Motor Car Co., St. Louis, Mo.
MORA—Mora Motor Car Co., Newark, N. Y.
McCUE—McCue Co., Hartford, Conn.
NATIONAL—National Motor Vehicle Co., Indianapolis, Ind.
OAKLAND—Oakland Motor Car Co., Pontiac, Mich.
OMAR—Omar Motor Co., Newark, N. Y.
OVERLAND—Overland Automobile Co., Indianapolis, Ind.
PENNSYLVANIA—Pennsylvania Auto-Motor Co., Bryn Mawr, Pa.
PREMIER—R. M. Owen & Co., 1759 Broadway, New York City.
PULLMAN—York Motor Car Co., York, Pa.
REGAL—Regal Motor Car Co., Detroit, Mich.
REO—Reo Motor Car Co., Lansing, Mich.
RICHMOND—Wayne Works, Richmond, Ind.
SHARP—Sharp Arrow Automobile Co., Trenton, N. J.
SPEEDWELL—Speedwell Motor Car Co., Dayton, O.
STODDARD-DAYTON—Dayton Motor Car Co., Dayton, O.
WELCH—Welch Motor Car Co., Pontiac, Mich.

FOREIGN PLEASURE VEHICLES.

BENZ—Benz Import Co. of America, New York City.
C. G. V.—C. G. V. Import Co., 1849 Broadway, New York City.
DELAUNAY-BELLEVILLE—Breweter & Co.
DE DION—De Dion-Bouton Selling Branch, New York City.
DE DIETRICH—De Dietrich Import Co., 3 W. 44th St., N. Y. City.
DELAHAYE—Delahaye Import Co., Park Ave., New York City.
FIAT—Fiat Automobile Co., 1786 Broadway, New York City.
HOTCHKISS—Hotchkiss Import Co., 1865 Broadway, N. Y. City.
ISOTTA—Isotta Import Co., 1620 Broadway, New York City.
LANCIA—Lancia Import Co., 244 W. 49th St., New York City.
MERCEDES—Mercedes Direct Agency, New York City.
PANHARD—Panhard & Levassor, 1881 Broadway, New York City.
RENAULT—Renault Freres Selling Agency. 1776 B'way, N. Y. City.

COMMERCIAL VEHICLES.

AMERICAN TRUCK—American Motor Truck Co., Lockport, N. Y.
BRUSH—Brush Runabout Co., Detroit, Mich.
CARTERCAR—Motorcar Co., Pontiac, Mich.
COMMERCIAL—Commercial Motor Truck Co., Philadelphia, Pa.
GAETH—Gaeth Automobile Co., Cleveland, O.
GRABOWSKY—Grabowsky Power Wagon Co., Detroit, Mich.
HART-KRAFT—Hart-Kraft Motor Co., York, Pa.
LAMBERT—Buckeye Mfg. Co., Anderson, Ind.
LANSDEN—The Lansden Co., 54 Lackawanna Ave., Newark, N. J.
LOGAN—Gramm-Logan Motor Car Co., Bowling Green, O.
MANHATTAN—Mack Bros. Motor Car Co., Allentown, Pa.
MAXWELL—Maxwell-Briscoe Motor Co., Tarrytown, N. Y.
PITTSBURG—Pittsburg Motor Vehicle Co., Pittsburg, Pa.
RAPID—Rapid Motor Vehicle Co., Pontiac, Mich.
REO—Reo Motor Car Co., Lansing, Mich.
RELIANCE—Reliance Motor Truck Co., Owosso, Mich.
SPEEDWELL—Speedwell Motor Car Co., Dayton, O.
STODDARD-DAYTON—Dayton Motor Car Co., Dayton, O.

TAXICABS.

ATLAS—Atlas Motor Car Co., Springfield, Mass.
C.G.V.—C.G.V. Import Co., 1849 Broadway, New York City.
DE DION—De Dion-Bouton Selling Branch, 43 Cedar St., N. Y. City.
FORD—Ford Motor Co., Detroit, Mich.
GENEVA—Cleveland Autocab Co., Geneva, O.
ROCKWELL—Bristol Engineering Works, Bristol, Conn.
SULTAN—Sultan Motor Co., 249 W. 64th St., New York City.

AMERICAN HIGH WHEELERS.

ANDERSON—Anderson Carriage Co., Anderson, Ind.
CHICAGO—Black Mfg. Co., Chicago, Ill.
HOLSMAN—Holsman Automobile Co., Chicago, Ill.
KIBLINGER—W. H. McIntyre Co., Auburn, Ind.
RELIABLE-DAYTON—Reliable Dayton Motor Car Co., Chicago, Ill.
SCHACHT—Schacht Mfg. Co., Cincinnati, O.

TIRES.

Ajax-Grieb Rubber Co., Trenton, N. J.
Batavia Rubber Company, Batavia, N. Y.
Consolidated Rubber Tire Co., Wall St., New York City.
Continental Caoutchouc Co., Warren St., New York City.
Courtney Rubber Company, 1976 Broadway, New York City.
Diamond Rubber Co., Akron, O.
Dow Tire Co., Boylston St., Boston, Mass.
Dayton Rubber Mfg. Co., Dayton, O.
Empire Automobile Tire Company, Trenton, N. J.
Ennis Rubber Mfg. Co., 22 Commercial St., Newark, N. J.
Firestone Tire & Rubber Co., Akron, O.
Fisk Rubber Co., Chicopee Falls, Mass.
G & J Tire Company, Indianapolis, Ind.
B. F. Goodrich Co., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Guaranty Faultless Auto Tube Co., 1779 Broadway, New York.
Hartford Rubber Co., Hartford, Conn.
Healy Leather Tire Co., 90 Gold St., New York City.
Leather Tire Goods Co., Upper Newton Falls, Mass.
Michelin Tire Co., Milltown, N. J.
Morgan & Wright, Detroit, Mich.
Motz Clincher Tire & Rubber Co., Akron, O.
Newmastic Tire Co., 68th St. and Broadway, New York City.
Pennsylvania Rubber Co., Jeanette, Pa.
Pneu l'Electric Co., 1610 Broadway, New York City.
Republic Rubber Co., 232 W. 56th St., New York City.
Irving Snell, 16 W. Main St., Little Falls, N. Y.
Samson Leather Tire Co., Broadway and 30th St., New York City.
Swinehart Clincher Tire & Rubber Co., Akron, O.
Zeglen Bullet Proof Cloth Co., Chicago, Ill.

TIRE ACCESSORIES.

Allen Auto Specialty Co., 1931 Broadway, New York City.
Auto Tire Inflating Company, 104 S. Eighth St., Brooklyn, N. Y.
Gilbert Mfg. Co., New Haven, Conn.
Nathan Novelty Mfg. Co., 66 Reade St., New York City.
Standard Leather Washer Mfg. Co., 24 Boudinott St., Newark, N. J.
Travers Blowout Patch Co., 1779 Broadway, New York City.

BATTERIES.

Eastern Carbon Works, West Side Ave., Jersey City, N. J.
Electric Storage Battery Co., Philadelphia, Pa.
Excelsior Battery Co., 14 E. 116th St., New York City.
Geissler Bros., 514 W. 57th St., New York City.
General Storage Battery Co., Boonton, N. J.
Lutz-Lockwood Mfg. Co., 39 Cortlandt St., New York City.
Marks Storage Battery Co., 102 Jefferson Ave., Brooklyn, N. Y.
National Battery Company, Buffalo, N. Y.
National Carbon Co., Cleveland, O.
Union Battery Co., Belleville, N. J.
Witherbee Ignition Co., 1876 Broadway, New York City.

COILS.

Atwater-Kent Mfg. Works, Philadelphia, Pa.
Autocoil Co., Jersey City, N. J.
Connecticut Telephone & Electric Co., Meriden, Conn.
Heinze Electric Co., Lowell, Mass.
Herz & Co., 203 Lafayette St., New York City.
Lavalette & Co., 112 W. 42d St., New York City.
National Coil Co., Lansing, Mich.
New York Coil Co., 338 Pearl St., New York City.
Pittsfield Spark Coil Co., Dalton, Mass.
C. F. Splitdorf & Co., 1679 Broadway, New York City.

MAGNETOS AND TIMERS.

Atwater-Kent Mfg. Works, Philadelphia, Pa.
Bosch Magneto Co., 150 W. 56th St., New York City.
J. S. Bretz Co., Times Building, New York City.
Herz & Co., 203 Lafayette St., New York City.
Hess-Bright Mfg. Co., Philadelphia, Pa.
Lavalette & Co., 112 W. 42d St., New York City.
Monitor Mfg. Co., Boston, Mass.
Motsinger Device Mfg. Co., 31 W. 42d St., New York City.
Philadelphia Timer & Machine Co., Philadelphia, Pa.
Remy Electric Co., Anderson, Ind.
C. F. Splitdorf & Co., 1679 Broadway, New York City.
F. H. Wheeler, Indianapolis, Ind.

PLUGS AND SWITCHES.

Jeffery-Dewitt Co., 217 High St., Newark, N. J.
C. A. Metzger, 1529 Broadway, New York City.
A. R. Mosler & Co., 163 W. 29th St., New York City.
Safety Device Co., Indianapolis, Ind.
Westchester Appliance Co., 1315 Canal Place, New York.

GENERAL IGNITION SUPPLIES.

American Electrical Novelty & Mfg. Co., 304 Hudson St., N. Y. City.
Herz & Co., 203 Lafayette St., New York City.
Remy Electric Co., Anderson, Ind.
Kokomo Electric Co., Kokomo, Ind.

LAMPS.

Atwood-Castle Co., Amesbury, Mass.
Automobile Supply Mfg. Co., 139 Emerson Place, Brooklyn, N. Y.
Badger Brass Mfg. Co., Kenosha, Wis.
J. W. Brown Mfg. Co., Columbus, O.
Edmonds & Jones Mfg. Co., Detroit, Mich.
Gray & Davis, Amesbury, Mass.
C. T. Ham Mfg. Co., Rochester, N. Y.
Rushmore Dynamo Works, Plainfield, N. J.

LUBRICATION.

H. T. Alexander & Co., 17 State St., New York City.
Joseph Dixon Crucible Co., Jersey City, N. J.
Duffy Grease Co., 520 W. 40th St., New York City.
Harris Oil Co., Providence, R. I.
Havoline Oil Co., 80 Broad St., New York City.
Keystone Lubricating Co., Philadelphia, Pa.
Wm. P. Miller & Sons, Mott Ave. and Hancock St., L. I., N. Y.
N. Y. and N. J. Lubricants Co., 14 Chambers St., New York City.

SHIELDS, TOPS, AND BODY MOUNTINGS.

C. Cowles & Co., New Haven, Conn.
C. A. Metzger, 1629 Broadway, New York City.
Empire Auto Top Co., 509 W. 30th St., New York City.
E. T. Burrowes Co., Portland, Me.
Hill Mfg. Co., 27 Fuller St., Buffalo N. Y.
National Auto Top Co., 1904 Broadway, New York City.
Pantasote Co., 11 Broadway, New York City.
Rands Mfg. Co., Detroit, Mich.
Sprague Umbrella Co., Norwalk, O.
Troy Carriage Sun Shade Co., Troy, O.
W. F. Poison, 27 Chenango St., Buffalo, N. Y.

CASTINGS.

Wm. Cramp & Sons Ship & Engine Bldg. Co., Philadelphia, Pa.
Isaac G. Johnson & Co., Spuyten Duyvil, N. Y.
Light Mfg. & Foundry Co., Pottstown, Pa.
Paul S. Reeves & Son, Philadelphia, Pa.
U. S. McAdamite Metal Co., Brooklyn, N. Y.
Wetherill Finished Castings Co., Philadelphia, Pa.

CARBURETERS.

Allen Fire Department Supply Co., Providence, R. I.
Byrne-Kingston Co., Kokomo, Ind.
F. H. Wheeler, Indianapolis, Ind.
Stromberg Motor Device Co., Chicago, Ill.
Willet Engine & Carbureter Co., 764 Ellicott Sq., Buffalo, N. Y.

GEAR SETS, ETC.

Brown-Lipe Gear Co., Syracuse, N. Y.
F. R. V. Auto Parts Co., 116 Nassau St., New York City.
Merchant & Evans Co., Philadelphia, Pa.
Sier Bath Company, 143 West 54th St., New York City.
Warner Gear Co., Muncie, Ind.

RADIATORS AND MUFFLERS.

Briscoe Mfg. Co., Detroit, Mich., and Newark, N. J.
McCord Mfg. Co., Chicago (Detroit, Mich.).
Metal Stamping Co., New York City.
Motsinger Device Mfg. Co., Pendleton, Ind.

AXLES AND BEARINGS.

American Ball Bearing Co., Cleveland, O.
F. R. V. Auto Parts Co., 116 Nassau St., New York City.
Hess-Bright Mfg. Co., Philadelphia, Pa.
Hyatt Roller Bearing Co., Newark, N. J.
Merchant & Evans Co., Philadelphia, Pa.
New Departure Mfg. Co., Bristol, Conn.
R. I. V. Co., Inc., 1771 Broadway, New York City.
Standard Roller Bearing Co., Philadelphia, Pa.
Timken Roller Bearing Axle Co., Canton, O.

VULCANIZERS.

C. A. Shaler Co., Waupun, Wis.

CHAINS.

Baldwin Chain & Mfg. Co., Worcester, Mass.
Diamond Chain & Mfg. Co., Indianapolis, Ind.
Whitney Mfg. Co., Hartford, Conn.

PRESSED STEEL.

Driggs-Seabury Ordnance Corp., Sharon, Pa.
A. O. Smith Co., Milwaukee, Wis.

SPRINGS.

Burnet Compound Spring, Inc., 738 Broad St., Newark, N. J.
J. H. Sager Co., Rochester, N. Y.

STEERING GEAR.

Gemmer Mfg. Co., Detroit, Mich.
Warner Gear Company, Muncie, Ind.

HORNS AND PUMPS.

Automobile Supply Mfg. Co., Brooklyn, N. Y.
Comptoir d'Innovation Pour Automobiles.
Elite Mfg. Co., Ashland, O.
Gabriel Horn Mfg. Co., Cleveland, O.
Gray-Hawley Mfg. Co., Detroit, Mich.
Sireno Co., New York City.

SPARE WHEELS.

E. T. Burrowes Co., Portland, Me.
Spare Motor Wheel of America, Ltd., Chicago, Ill.

SPEEDOMETERS.

Auto Improvement Co., New York City.
Hoffecker Co., Boston, Mass.
Jones Speedometer Co., New Rochelle, N. Y.
Stewart & Clark Mfg. Co., Chicago, Ill.
Veeder Mfg. Co., Hartford, Conn.
Warner Instrument Co., Beloit, Wis.

SHOCK ABSORBERS.

Ernest Flentje, Cambridge, Mass.
Hartford Suspension Co., Jersey City, N. J.

TOOLS.

Anderson Forge & Machine Co., Detroit, Mich.
Buda Foundry & Mfg. Co., 26 Cortlandt St., New York City.
Coes Wrench Co., Worcester, Mass.
Noonan Tool & Machine Co., Rome, N. Y.
Oliver Mfg. Co., Chicago, Ill.
Perfection Wrench Co., Port Chester, N. Y.
Rubly Mfg. Co., Tuckahoe, N. Y.

IN GENERAL.

American Automobile Association, 437 Fifth Ave., New York City.
American Metal Hose Co., 173 Lafayette St., New York City.
American Thermo Ware Co., 16 Warren St., New York City.
American Thermos Bottle Co., Brooklyn, N. Y.
Austro American Separator Co., 6710 Hough Ave., Cleveland, O.
Automobile Club of America, West 54th St., New York City.
Brandenberg & Co., 1777 Broadway, New York City.
Brown Co., Syracuse, N. Y.
Calorie Mfg. Co., 2110 Allegheny Ave., Philadelphia, Pa.
Charles E. Miller, New York City.
Charles J. Downing, 54 Warren St., New York City.
Class Journal Co., 239 West 39th St., New York City.
Columbia Nut & Bolt Co., Bridgeport, Conn.
C. A. Buffington & Co., Berkshire, N. Y.
F. A. Brownell Motor Co., Rochester, N. Y.
Federal Mfg. Co., 104 Cushing St., Lowell, Mass.
Garage Equipment Co., Milwaukee, Wis.
George S. Sherman, Great Neck, Long Island, N. Y.
Gloversville Auto Glove Co., Gloversville, N. Y.
High Wheel Auto Parts Co., Muncie, Ind.
Hydraulic Oil Storage Co., 25 Broad St., New York City.
H. & C. Bottle Co., 652 Broadway, New York City.
I. J. Smith Mfg. Co., 4233 Park Ave., New York City.
International School of Aeronautics, Morris Park, Westchester, N. Y.
J. H. Bunnell & Co., 20 Park Place, New York City.
John A. Salman & Co., 17 Bromfield St., Boston, Mass.
John S. Wilkinson Co., Newburgh, N. Y.
Long Island Auto Supply Mfg. Co., 31 Grant Sq., Brooklyn, N. Y.
Motor & Accessory Manufacturers, 414 Union Bldg., Newark, N. J.
N. Lazarnick, 29 West 42d St., New York City.
National Retail Automobile Dealers' Ass'n, Oshkosh, Wis.
National Surety Co., 116 Broadway, New York City.
Pneu l'Electric Co., 1610 Broadway, New York City.
Quincy, Manchester, Sargent Co., Plainfield, N. J.
Raimes & Co., 64 Ferry St., New York City.
Randall-Faichney Co., Boston, Mass.
Royal Equipment Co., Bridgeport, Conn.
Seamless Rubber Co., New Haven, Conn.
Shelby Steel Tube Co., Hudson Terminal Bldg., New York City.
Shore Instrument Mfg. Co., 226 West 24th St., New York City.
Spicer Universal Joint Mfg. Co., Plainfield, N. J.
Standard Welding Co., Cleveland, O.
Stanley & Patterson, 23 Murray St., New York City.
The Motor Accessories Co., 43 Cortlandt St., New York City.
The S. B. Specialty Co., 143 West 64th St., New York City.
Travelers' Insurance Co., Hartford, Conn.
Vanguard Mfg. Co., Joliet, Ill.
Weed Chain Tire Grip Co., New York City.
Wilson Trading Co., 46 Cortlandt St., New York City.
W. M. Briggs, 136 Liberty St., New York City.
Y. M. C. A., 316 West 57th St., New York City.
York Auto Wheel Co., York, Pa.

AMERICAN MOTOR CAR MANUFACTURERS' ASSOCIATION

By ALFRED REEVES, General Manager A. M. C. M. A.

UNDER the careful leadership of some of the greatest men in the industry, who at all times have carried out its original purposes, the American Motor Car Manufacturers' Association is classed in the front ranks of industrial organizations of its kind. It has assumed the leadership in motor car organizations and is now looked upon as an authority and a power for good in its chosen field. The product of its members bearing the stamp of "Standard Manufacturers" is received with favor throughout the civilized world, and the public that buy cars feel that in buying a car which is enrolled in the American Motor Car Manufacturers' Association are securing cars of reliability and for the money invested. Membership constitutes the badge of all that is desirable in motor car trade.

In all that has stood for the advancement in the producing, disposing and using of motor cars, the A. M. C. M. A. has taken a leading position. The real power of the association may perhaps be judged best by the fact that estimates place 65 per cent. of all cars made and sold in America to the credit of A. M. C. M. A. members.

During the four years of its existence the association has accomplished a world of good, not only for its members, but all interested in the making, selling and operating of an automobile.

The automobile industry, being extraordinary in many respects, it was natural that its trade association should have a growth of a phenomenal sort in its four years of organization, during which time it has accomplished so much for those involved in the trade and pastime. It has worked consistently for its members to the ultimate benefit of the buyer.

The association was formed in the belief that competitors in the business had certain mutual interests that could best be cared for by a central organization. Independence is the keynote, for its members believe competition brings advancement. Within its ranks are the makers of the highest as well of the lowest priced cars, including all styles and types. It is believed that these makers offer the best values, and this would seem self-evident, for they are selling the largest number of cars.

It aims to further the use of motor cars in general and to assist the common interest of its customers as well as its members. Buyers of cars made by concerns in the A. M. C. M. A. are assured of proper construction and materials at fair prices. The companies conduct their business independently under their own business methods, each endeavoring to secure the greatest favor and trade from the public. Their interests are identical only in so far as they are concerned in the work of the association which relates to the obtaining of combined privileges for their good with the ultimate object of securing for the public the very best in automobile construction. The work of the association at all times is to obtain privileges and information such as will better enable the various standard manufacturers to retain their present leadership in motor car building.

Information and benefits are sought that will permit A. M. C. M. A. members to produce the best cars at the lowest possible cost, so as to offer their cars to the general public at prices within reason and yet permit of a fair margin of profit. When a maker can combine the maximum of quality at a minimum of price, the trading is certain to be satisfactory to buyer and seller.

While much of the work of the association furnishes benefits of an abstract nature which is enjoyed by the trade and public in general, there is more of a concrete nature that involves the members alone.

Compilation of statistics, both here and abroad, furnish a valuable guide to the makers. The lists of agents and dealers is another good work of the A. M. C. M. A. Uniform guarantees that are liberal to the buyer and fair to the maker are advocated, while plans for advertising and information regarding the value of mediums are offered. Work for a national law providing for a single license number, good in every State; the perennial question of good roads and legislative matters are handled by competent committees. Every year hostile legislation is opposed and many unreasonable bills have been withdrawn through the work of the legislative committee.

Its work in the matter of good roads has been of great importance, and on this department alone many thousands of dollars has been expended. There is unquestionably a great improvement under way for improved highways, and undoubtedly the A. M. C. M. A. was of great assistance in the bringing about of this condition.

One of the best works of the association is the publicity department, which aims to supply authentic information to the newspapers and trade publications. Articles of a technical and a statistical nature are supplied for the information of the general public, all of which has contributed to a more thorough understanding of the automobile, its rights and the rights of its owner and driver. Such things as liability insurance, freight rates, larger and more freight cars, are given attention.

In the early days, when the foreign cars were factors in the trade, a representative was maintained abroad and a delegate sent from this country to attend the foreign shows. A careful record is kept of importations, which are rapidly decreasing.

There are scores of other things which the association does quietly and industriously, but those mentioned will give a fair idea of its work. On its committee of management and in its membership are the pioneers and most of the leading men of the automobile industry, including Benjamin Briscoe, chairman; R. E. Olds, H. O. Smith, G. Vernor Rogers, W. H. VanDervoort, Charles Lewis, W. C. Marmon, C. G. Stoddard, S. H. Mora, and Alfred Reeves, general manager.

GROWTH OF MOTOR AND ACCESSORY MANUFACTURERS

THOSE who have followed the course and rise of the automobile show in this country can readily recall the time when there was no such thing as an accessory exhibit—when the vast amount of floor space represented by balconies and galleries and the hundred and one odd corners and nooks that are now so zealously sought out and filled were vacant. Simply because there was no one to fill them—there were no manufacturers of accessories pure and simple, and the dealer in automobile supplies had yet to come into existence, so that an automobile show could then be comprised by the exhibits of its main floor and with room to spare. Then along come the accessory manufacturer and, with the increasing demand for space in which to show cars, he was perforce relegated to the upper regions, or to the basement. He had to bid for space as an individual and as the weight of his protest as such was small, he had to take what was handed out, or nothing at all.

But in the course of a surprisingly short period, the accessory manufacturers became so numerous that it was quite evident that in the aggregate their weight would be sufficient to exert no little influence, not alone for better treatment at the hands of show-managing committees, but likewise for many other purposes where reforms were needed. The outcome was the incorporation of the Motor and Accessory Manufacturers. Within a very short time after its organization the new association included practically all the important accessory manufacturing interests in the country in its membership.

The present officers are H. S. White (National Tube Company), president; H. E. Raymond (B. F. Goodrich Company), first vice-president; H. T. Dunn (Fisk Rubber Company), second vice-president; F. E. Castle (Gray & Davis), third vice-president; W. S. Gorton (Standard Welding Company), treasurer, and P. S. Steenstrup (Hyatt Roller Bearing Company), secretary, the headquarters and office of the secretary being located in the Union Building, Newark, N. J.

The directors are Clarence E. Whitney (Whitney Manufacturing Company), D. J. Post (Veeder Manufacturing Company), C. T. Byrne (Byrne, Kingston & Company), H. W. Chapin (Brown-Lipe Gear Company), E. S. Fretz (Light Manufacturing & Foundry Company), and L. M. Wainwright (Diamond Chain & Manufacturing Company).

In order to confine the expense of its members for space at automobile shows to legitimate events of this kind, the Motor and Accessory Manufacturers issue sanctions for shows, and the members of the association do not exhibit at those which have not received the approval of the governing body. And by dealing with show managements as a unit, much expense and inconvenience is saved the members, the Motor and Accessory Manufacturers being one of the largest single purchasers of space at the Palace this week. The entire needs of its membership are contracted for *en bloc* and the association itself then parcels out the space and awards the different locations, the accessory manufacturers themselves thus having no dealings whatever with the show management as individuals.

But it is not alone in the matter of shows that the Motor and Accessory Manufacturers has succeeded in benefiting its members, the association maintaining a credit department which has proved of considerable value, and it has also lent its aid as a body to the procurement of more equitable freight rates from the railroads, while other matters affecting the interests of its members as a whole have likewise come in for attention.

IMPORTERS ARE SHOWING AT PALACE AS A BODY

IN view of the fact that the imported cars represented in this country are now being shown by their agents in connection with the A. M. C. M. A. show in the Palace, the impression is current that each exhibit represents the individual and independent efforts of its sponsor, and that the Importers' Automobile Salon had nothing to do with the show as an organization. This is not the case, as when the question of exhibiting foreign cars this Winter came up some time ago, the Importers' Automobile Salon came to an agreement with the American Motor Car Manufacturers' Association and contracted for 15,000 square feet of floor space, all of which is located on the main floor of the Palace. The Importers incorporated early in 1904, the objects being to hold shows and further the introduction of foreign cars in this country generally. Its first show was held on the top floor of Macy's in December, 1904, and introduced the plan of uniform decorations for exhibits, which has since been universally adopted in this country, reaching its climax in the Importers' show in the Garden last January, which was generally conceded to be the most artistic conception ever produced for an American automobile show.

When first organized the membership of the Importers' Salon was very small, but its work of encouraging the introduction of foreign cars and of cooperating for the mutual benefit and protection of its members which has been carried out in the interim, has proved so successful that now it numbers practically every importer of foreign cars in the country in its ranks, even including the New York Taxicab Company.

C. R. Mabley acted as manager up to a short time after the holding of the Garden show last January, when he resigned, and the efficient work of Walter R. Lee, up to that date secretary of the organization, was recognized and he was promoted to the vacancy left by Mr. Mabley's resignation. The other officers of the Salon are, Andre Massenat, president; W. H. Barnard, vice-president; Paul Lacroix, secretary; W. C. Allen, treasurer, the directorate comprising E. R. Hollander, A. A. Barrelet and K. Neubauer, in addition to the officers already named. Charles H. Sherrill acts as counsel to the organization. The members include the Renault Frères Selling Branch, Panhard & Levassor, C. G. V. Import Company, Hol-Tan Company, Delahaye Import Company, Palais de l'Automobile, S. B. Bowman Automobile Company, De Dietrich Import Company, New York Taxicab Company, Brewster & Company, Benz Auto Import Company of America, the Hotchkiss Import Company, and the Fiat Automobile Company.

RETAIL DEALERS HAVE STRONG ARM IN N. R. A. D. A.

JUST a little more than a year ago, the National Retail Automobile Dealers' Association came into being—during the course of the 1907 Chicago show, to be more definite, its inception being due to the foresight of a few progressive dealers attending that show. They laid the plan before a number of their confrères at the time, and the result is already history, the N. R. A. D. A. now being able to celebrate its first anniversary.

While this brief résumé of the manner of its coming into being suffices to tell the story of its creation, it does not by any means convey the slightest idea of the task confronting its organizers, prominent among whom are C. F. Jensen, Joliet, Ill., president; Rudolph Hokanson, Madison, Wis., vice-president; L. Ohnhaus, Ft. Wayne, Ind., treasurer, and J. A. Crum, Oshkosh, Wis., secretary. These dealers and their confrères on the board of directors, D. P. McClure, Oskaloosa, Ia.; J. C. Tanberg, Eau Claire, Wis., and J. B. Sutter, Burlington, Ia., were instrumental in fostering the idea of organizing a cooperative association of automobile dealers and of carrying the plans into execution at the Chicago show a year ago.

So far so good, but only those who have had experience in the formation of similar trade organizations can appreciate the true extent of the job undertaken by these progressive dealers.

President Jensen and his associates of the N. R. A. D. A. have realized this to the full from the very start, and there are accordingly no sinecures attached to the Association; the directors and officers receive no compensation for their work in connection with it and their reward can come only through the Association's success, and then only to the same extent that it will benefit every automobile dealer who becomes a member. The dues are merely nominal. It is plain then that there are no selfish motives actuating its incorporators in their efforts to place the retail automobile business on a more satisfactory and profitable basis, and that their work should be seconded and encouraged by every automobile dealer who is alive to his own interests becoming a member of the Association.

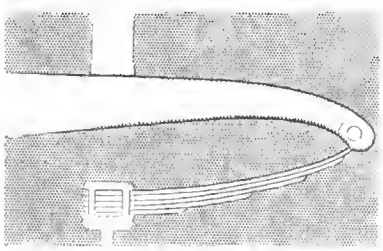
Generally speaking, the objects and purposes of the N. R. A. D. A. are along lines similar to those of any organization formed for the purpose of mutual benefit and protection by dealers engaged in marketing the products of any industry. Such organizations when founded and conducted on business principles for the sole benefit of their members have almost invariably proved highly successful in achieving the ends sought.

The second annual meeting of the Association will be held during the Chicago show next February.

THE MECHANICAL LESSON OF THE PALACE

By THOS. J. FAY.

LET it not be supposed that a great exhibition like the one now going on at the Grand Central Palace can be held year after year and no good to come of it. China tried to live in isolation and that ancient empire fell away to nothingness because the time came when she had nothing more to teach her progeny, nothing more to learn from herself, and nothing to gain by living. The automobile industry, aside from any attempt to stimulate trade, has much to learn, and of progress the half of it is yet as the unearned increment. Each year with its offerings renders up an accounting on a scale far greater than the previous, and the question is as yet unanswered as to when the end of the years of great improvement will say a last farewell.



Front End of Chassis (Frame). Showing increased depth and decreased curvature.

The doings during 1908 in preparation for the 1909 trade were the most active and, on the whole, the most advanced in the way of practical results. The plausible theories were given a working chance, the after thoughts were put in better settings, and the things that promised much and delivered little were withdrawn from active service. The effect of quantity on cost is to be seen at every hand, but all the improvements to be noted must not be understood as the product of doing things on a large scale. As a matter of fact, many of the crystallized features in the 1909 automobiles were long in contemplation, awaiting the day when they could be utilized to advantage, and in many instances they took the place of less desirable schemes, thus rendering the improvement of double value.

Classification of the Automobiles Available.—Variety is the password, and a cleaner line of demarcation is to be distinguished. The condition of "chaos" that once permeated the situation is gone. As it is, the respective classes or types of automobiles are distinctive and are capable of being classified.

Runabout Types.—In the main, this class of automobiles are of the single-seat variety, but it cannot be said of them that they are confined to the cars in which the motor is of the one-cylinder design, since some have two cylinders, and the four-cylinder runabout is also to be seen. In some cases the little cars have accommodations for more than two persons, in that either a rumble seat is furnished or a folding seat is provided. In general, they have longer wheelbase dimensions than formerly, and they are very much more formidable than even some of the "roadster" types of even last year.

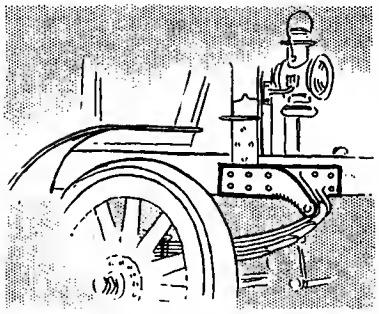
Roadster Types.—They cover a wide range, both as respects the size of the cars and the power available. In some cases it is difficult to tell a roadster from a runabout, and again the roadster looks like a big racing machine. The roadsters use motors from the low-powered "double opposed" to the finest examples of the "six," with "fours" numerous.

Light Touring Class.—There is probably no other division of the industry that has undergone nearly the same evolution as the light touring cars. They are in great presence, in divers sizes, and they represent value such as was never before to be seen. In the cars in this class will be found more capable propositions than were classed as "big" touring cars even last year, and these same light touring cars would put to shame the "foreign red devils" that cost $10,000 less than four years ago. The wheelbase ranges from 100 to 110 inches, and the motors are of the four-cylinder type, for the most part rated at from 24 to 30 horsepower. As a rule, the bodies are of the five-passenger touring class (straight-line effect), with ample accommodation and artistic in effect. On the whole, it is these automobiles that will be the mainstay of the makers in this field for the immediate future.

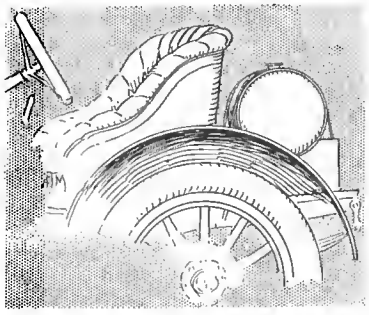
Standard Touring Cars.—These are automobiles in the broadest sense of the word. When the dictionary is restandardized and the word "automobile" is defined the definer will have the image of these cars in mind, and he will be right. Any further play on words is a loss of time, and yet to dismiss the most interesting part of the exhibition without affording to the cars as much space as is accorded the runabout types would seem to be ill-advised. In these cars the power plant is the most complete and systematic piece of sturdy mechanism that man ever devised. The wheelbase is long, ranging from 110 inches as the low range to 140 inches (or thereabouts) in the extreme examples. The body work, aside from the luxuriousness and the space afforded, is art personificd. The silent performance is the wonder of tbe age, and it is due to absolute precision of fit of the 2,400 separate parts that enter into the construction of an automobile of tbis class. One single loose member in a car of so much power and speed would make itself known were it of an ill fit, or if the relations were out of harmony. The motors range from the "big six" down to the four-cylinder examples of equal or even greater power.

Town Cars.—In this class will be found cars not with great power or of a long wheelbase, for neither are necessary. The wheelbase is not far from 100 inches, as an average figure, and the power is rarely over 30 horsepower. With a short wheelbase, the road performance is quite in accord with the needs, and, as the speed is not to be high, considering paved streets, the power does not have to be over the maximum stated, while some of the examples are even with half (or less) of the figure given. The body work in town cars is the exterior feature that attracts attention, although from the mechanical point of view it is the least of the features to be considered. At all events, the body work in the town cars is the most luxurious and the most costly of all the work there to be seen. The bodies are made in broughams, landaus and limousines, richly upholstered and fitted with every convenience possible to place on wheels, from the point of view of convenience and comfort.

Buggy Types.—The surprise of the exhibition is due in no small measure to the number of cars of this type to be seen, and again to the fact that while the buggy type has held to its aims it has expanded and amplified. The uses to which these cars can be put, in view of their low first cost, coupled with their extreme simplicity and low cost of maintenance, are not to be lightly regarded. They serve for a wide range of purposes, largely in the utility zones of activity, and they number their friends by the thousands among the pleasure-seekers as well. The power for speed is high, which is but a way of calling attention to the fact that they will make headway on all kinds of roads in inclement weather. The body work holds to the buggy type as it was handed down by the "craft." and the reasons are good.



Manhattan Commercial Front Spring Hanger Shows Stability.

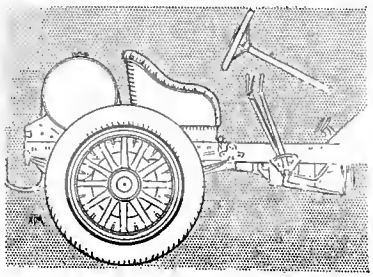


Gasoline Tank on Rear of Chassis.

Taxicabs.—They differ but little from town cars, unless it is that the body work is with a view to hard usage. The power plant is generally identical, with a short wheelbase for the same reason, and as to speed there is no occasion for gearing to a high ratio, hence the power is limited as well. There is goodly showing of cars for this service, and the schemes of design are such as to assure a low cost of maintenance.

Specialties.—For public service there are fine examples of automobiles to be used in fire, hospital and police service. Most of the companies who cater to this class of trade find it of small avail to exhibit the products and are therefore content to depend upon literature to make known the facts. But if there are automobiles for municipal work, it is true as well that "sight-seeing" automobiles and cars for hotel "bus" service are in a high state of development. Indeed, this phase of the industry has grown a wide pace, and the demand is strikingly large, with small chance of having reached the limit in view of the wide field as yet fully explored.

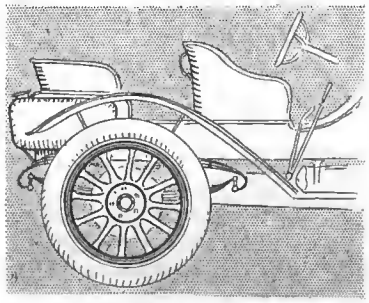
Having thus introduced the several types of automobiles to be seen at the show, it may not be out of place to discuss the "mechanical trend" in some detail, hoping thereby to evolve the drift of events. But if it is expected that this exposé will be as an indication of revolutionary thoughts, disappointment will await the reader. A thorough examination of all the products at the show fails to develop anything but a more complete refinement of accepted principles as they have existed for several years.



Roadster Seat Well to the Rear.

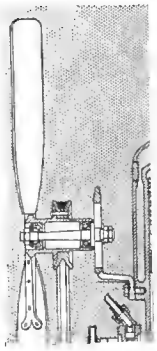
Power Plant Tendencies.—Motors are divided up among the three classes as follows: (a) four cycle, water cooled; (b) four cycle, air cooled; (c) two cycle, water cooled; in the proportion as they bave heretofore held, with little indication of gain, the one over the other. If anything can be said, it will be to maintain that each type has its supporters, and they find no valid reason for backing down.

The Number of Cylinders.—In spite of all the talk that has gone the rounds, the fact still remains that the situation is substantially as formerly, in that the single-cylinder propositions are looked upon as a stable basis, serving well in the cases requiring about 10 horsepower. There is even a tendency to take advantage of the inherent economy of the single-cylinder idea. It is well known that a single-cylinder motor indicates a high thermal efficiency, which is but another way for saying that the gasoline consumption is low in the type. With well-balanced reciprocating members and fairly long stroke, if the flywheel is suitably designed, the single-cylinder motor serves as a suitable source of power in the automobiles weighing not over 1,000 pounds.



Rumble Seat Over Gasoline Tank.

The double-opposed idea is still to be seen in the cars in which its application has been found to be advantageous, and there are fine examples of the scheme scattered all through the show. There are no three-cylinder motors to be seen, the reason for which has never been adequately explained. Of the "fours" it might be said, "The woods is full of them," and of the "sixes" they are there, in far greater and more imposing presence than ever before.



Fan Pulley with Ball Bearings.

How the Cylinders Are Fashioned.—"Individual" cylinders are about as prevalent as before. "Cast in pairs" has held all former ground. "En bloc," representing the real advance, has numerous good examples. Gray iron is used, a little better than in former years, walls more uniform, and the desire to attain tissue-paper thickness has retired to obscurity. Water jackets extend down to about the lower end of tbe stroke, thus affording a cooling medium on the exterior surface of every portion of metal that entertains hot gases on the interior surfaces. Steam pockets are carefully avoided, and unequal expansion is a phenomenon of the past, in so far as skill can influence the situation.

Crankshafts.—The five-bearing type for four cylinders is fighting the two-bearing type for supremacy. The three-bearing crankshaft is as a disinterested spectator on neutral ground. In the show, it is fair to say, the three-bearing crankshaft is in the greatest presence, with the five as a close second. As to the bearings, it is to note that the "plain" type is still the mainstay, with here and there a fine example of what can be done with ball-bearing crankshafts. The ball-bearing type seems to hold in every case in which it is so fortunate as to gain a footing, but it does not spread rapidly because of the higher cost. If plain bearings will do the work, they being cheaper, the makers naturally hold to them. The materials of the crankshafts are not "jewelry steel," as some of the alloyed products are called, unless in a few cases. The plan seems to be one in which advantage is taken of the fact that heat-treated (special) steel holds the requisite qualities to a marked degree, and, since a slight increase in "section" lends enormous extra ability, the section is a little "flatter" and the material is far easier to work, while the cost of replacement is relatively very low indeed.

Aluminum vs. Cast Iron.—In crankcases and the housings for gear sets, aluminum is the main product. Cast iron is used in isolated cases. That cast iron is the superior metal, from the strength point of view, is not to be gainsaid. That aluminum is lighter goes without saying. In all the examples there are evidences of refinement, in point of design, and here and there are examples in which provision is made to get at the bearings through covers big enough to serve the purpose. The bearing supports are more stable than formerly, and the means for disposing of the "used" oil are carefully worked out.

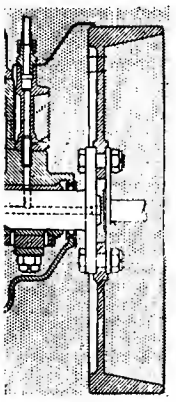
Valve Gear.—The valves of special steel, in probably every instance, are not extra large, nor are they small. They are, in point of area, as large as possible, without becoming noisy. This question of noise has been looked after to a mighty degree. Makers have looked at the question from the angle that the patrons take, and the result is a happy medium between large valves and noiseless performance. The tappets and guides are with adjustments in most cases, and the "play" is so little as to abort the tapping noise that made automobile motors conspicuous up till a short while ago. By suitably shaping the cams, it was

found possible to do away with almost all of the lost motion, instead of the large amount that formerly did obtain (as much as 1-16 inch in some cases), and means are provided to cushion the "tap" in notable instances. The half-time gears are more healthy than in earlier examples, in that they are more securely keyed on to the shafts and spindles, while the gears themselves are of wider face and better material than before.

Clutches.—A pretty mess. With tendencies, without any question, tendencies that cannot be defined at this time in bold language. The multiple disc clutches are slowly taking definite shape, along lines in which an attempt is being made to depart from the trouble tendencies of the type. It is well understood that a large number of thin discs will ultimately give trouble because the edges of the discs as they press against the keys will "broom" and then the members will not engage. It is also known that oil will become "gummed" and then the clutches will fail to do the required work. Then there is the question of "flashing" the oil, if the pressure is high and the clutches slip.

The tendency is in the direction of a less number of wider discs, lower pressure, and materials that will show a high coefficient of friction at low pressures in oil with a high flash point and free from tendencies to "gum." The discs are naturally of an increased diameter, and in many cases "cork inserts" are used; they afford the requisite advantages. Besides multiple disc clutches, there are many of the well-known cone clutches in use, some with leather faces, but more with leather together with "cork inserts," it being the case that the presence of oil on the faces will work no ill effect if the cork is used also. Besides the clutches, as before stated, there are examples of discs with grooves in the faces, and some examples of band clutches as well. On the whole, the clutch situation is in a very encouraging state, and failures (outright) will not be found in the cars at the show.

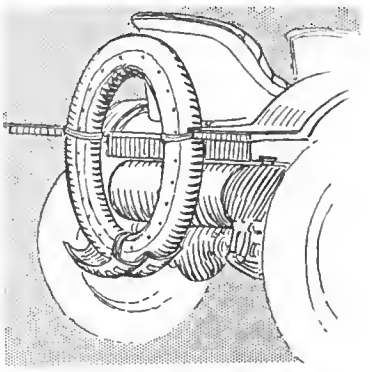
Transmissions.—Three speeds and reverse, direct on the high, selective, and the story is three-quarters told. A few of the gear-sets are with four speeds, direct on high or second; and of the "planetary" type they are used in the well-known cases in which the advantages are not to be gainsaid; of the progressive types of gears there are few examples, those of the makers that have always adhered to the principle claiming for them that ease in shifting that comes, with no chance of sliding into the wrong speed, or stalling the motor. The materials used in the gears is mostly "alloy steel" of the finest grades, and trouble in gears due to inferior material is now unheard of.



Separate Flanged Cardan Shaft.

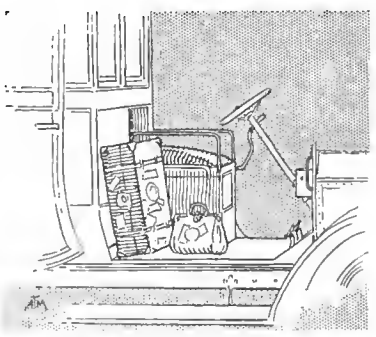
Live Rear Axles.—With floating, semi-floating and keyed shafts, all are to be seen, under such splendid conditions of design, material and workmanship as to render a choice as the expression of a prejudice rather than as a necessity. The "housings" are far more stable than formerly, notwithstanding the fact that excess weight has been eliminated very largely, if not completely. Struts are still used, but they are more stable, and in some cases the housings are as "drawn steel tubes," free from joints, and they are quite as good as they look. The "spring perches" are not "brazed," but are allowed to slip on the tube, within limits, doing away with the strains that formerly did reside in the springs on that account. The "differential" and the bevel drive, all housed in, with adequate means for oiling, frame up for continuous and noiseless performance as never before, while the ground clearance is now adequate.

Side Chain Drives.—From abroad came a story that the "sprocket," as a passing fancy, is losing ground. They may be copying some of our "shaft drives" over there; they can well afford to do it; we always had them on the hip in this connection. But let us not go wild about their slants. In "stable America" there is a place for everything, and we know the value of putting the right horse in the right stall. That the chain situation is now just as good as it ever was, is shown by statistics which did not prevent the multiplication of the "shaft drives." The distribution has followed along natural channels, and that the same is now fairly representative of what will be a natural future is assured by those who seem to be abreast of the times.



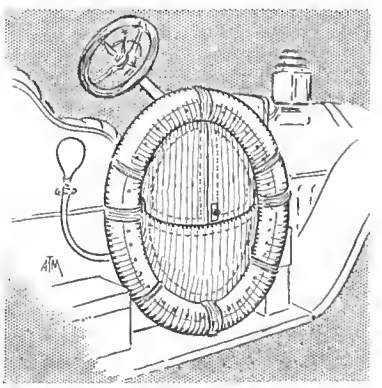
Good Provisione for Extra Caeings

Brakes.—Law, and more law, all about brakes, rather goes to show that they were not all that they should be in the past. The new crop is in anticipation of the fact that the community will demand good brakes in the future. Time was when cars were studded with brakes, none of which was over good, and numbers were placed to make up for the deficiency in point of quality. In the 1909 cars the brakes are capable in the extreme, and, as a result, few in number. In some cases there are two sets in the rear wheel drums (internal and expanding), while in other examples the old idea holds, in that one set is on the rear wheels, and a differential brake is used for service. In all the examples the drums are of increased diameter, and the faces are ample to assure long life. The facings are all the way from metal to metal to "cork inserts," with a decided tendency to get away from the class of materials that will not stand heat. Fortunately, the properties of cork are such that they will not char and the presence of oil does good. The further tendency is in the direction of the use of asbestos supported by a wire mesh to give strength.



Baggage Space in the Atlas Taxicab.

Axles in General.—Departing from the question of the types of "live rear axles," it is to note the very general use of I-section axles, both for rear and front. They are die forged, frequently without welds, and so nicely proportioned for the work as to be difficult to improve upon. In heavy trucks the axles are both I-section and square, depending, on circum-

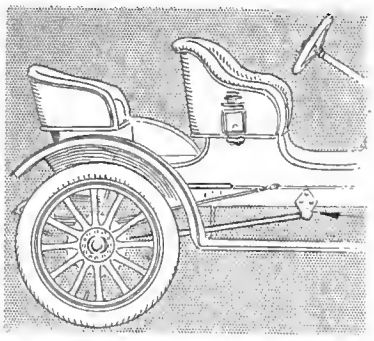


Waterproof Casee for Extra Tires.

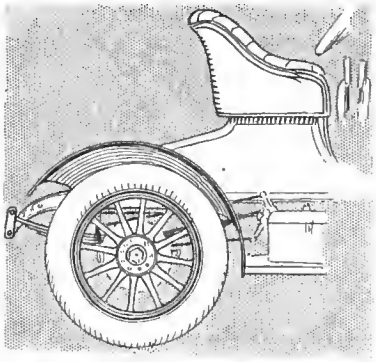
stances. The road wheels turn on ball and roller bearings, and in general the construction is all that can be desired or suggested.

Wheels, Rims, and Tires.—As a rule the wheels are of wood, with nicely shaped spokes, and in so far as can be determined at the show the wood is up to a high standard. There is evidence of the use of "disc" wheels, which in the course of time will have to be seriously considered, unless a new supply of wood can be located, wood such as will maintain the high standard claimed for second growth hickory, which is growing more scarce year by year. Rims are up to a high standard with a decided showing of "demountable" methods. Tires are larger than ever before, which is one of the year's improvements. The "foreign" idea of using "dual" rear pneumatic tires (as is the practice with solid tires on commercial trucks) has not been adopted in this country. Spare wheels are in good demand, and the autoing public seems to take to the idea.

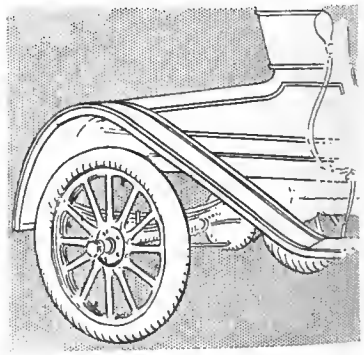
Chassis Features.—Channel sections of alloy or special carbon steel seem to be the mainstay. Wood is used to some extent. The autoing public now fully understands that wood is adequate for the purpose, and they also know that the channel section is appropriate. Referring to the channel section, the shapes are much more stable than before and the "drop frame" idea is much in vogue, especially in town cars, but not confined to them. As a rule, the frame is deeper and the flange is wider, while the "laterals" are nicely placed and well braced.



Ball and Socket Distance Rod. (Overland.)



A Very Effective Mud Guard. (Mitchell.)



Mud Guard of Length and Sweep. (Maxwell.)

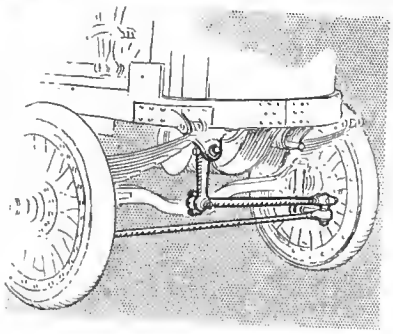
Three-point Suspension.—In point of theory, this principle is adapted by every builder of automobiles, but it is not directly applied in all cases. When the unit power plant is used the three-point suspension is invariably directly advanced. When, however, the separate unit system is used, then the three-point suspension is applied to the separate units. In some cases the principle is so deftly applied that only the designers are fully alive to the fact. In other words, they may fasten at four points, but closer observation will show that one of the fastenings is with a "clearance" hole, so that the fourth point is merely a "rest," the advantages of which are self-evident. On the whole, it is fair to observe that the principle of the three-point suspension is in pretty general use.

Self-Contained Power Plants.—A goodly number of the cars of the year embody the self-contained power plant idea. In other words, the motor, clutch, and transmission gear-set are all enclosed within one housing, and the claim is made for them that the bearings will maintain correct alignment. Nothing could be more near the truth, and the plants so designed are very compact indeed.

Individual Unit Power Plant.—As against the self-contained power plant, there is the old standard construction in which every unit is separate. In this construction all the bearings are maintained in perfect alignment, because there is no rigid connection between the separate units, and within the respective housings the alignment is under the best possible conditions, because the housings are short. Universal joints are used between the units, and they, in turn, are housed in, thus preventing the oil from escaping and "grit" from entering. In this class of work, it is the aim to be able to remove one of the units without disturbing the other, and this plan is nicely carried out in the examples to be seen. It is fortunate for the purchasers of cars that they can embrace the talking points of either school, with no very great fear of having to suffer for their choice; both plans work and that is all the purchaser, in any case, is entitled to, unless it is that he would like to bolster his business acumen to the extent of enjoying the feeling that would be his were the plan he rejects to prove a failure. To this extent the 1909 purchaser is booked for a disappointment.

Spring Suspensions.—The springs as they now obtain "can" the vibrations as they never did before. The reason for this is not on the surface, nor is it well understood by autoists in general. It was not so long ago that it was the style to lay the failures up to the quality of the material used in the springs that failed to render complete returns, when as a matter of fact, it was because enough material was not used. When, in the attempt to improve, a scant amount of inferior material was supplanted by a more scant quantity of the finest material, it came as a surprise when the trouble increased instead of decreasing. It did not take long to determine that it was largely a matter of supplying the requisite quantity of material to accomplish the task. A pound of steel will dissipate a certain amount of energy on a basis that will not shorten the life of the steel below a commercial point. If the steel is of a fine grade, it will have a longer life, but it is also true that however good the steel, if it is sadly overworked its life will be short indeed. In the cars of the year this matter is on a fair footing, and as a result the springs, while they look very much as in the past, they are more capable. There is a growing tendency in favor of "scroll" types of springs, in relation to which there is an argument that speaks well of them. Otherwise the situation is as formerly, excepting that it is the custom now to use enough material to perform the service.

Ignition Systems.—Magnetos are now regarded as standard, and they are used extensively, if we may not say to the exclusion of the other systems. In every case in which a dual system is employed, the magneto is there as the system to run on, the "coil" being placed for emergency purposes. Were magnetos lower priced, they would be employed to the exclusion of coils on the systems using but one source of energy, provided motors could be started on the magneto, which does not seem to be impossible. On the other hand, the coil systems have improved so much that they are thoroughly capable under all the conditions in which it is not necessary to squeeze the last drop of power out of the motor. Many of the smaller cars are fitted with coils, and in some cases "master vibrator" systems are used. In some instances the magneto is used in conjunction with a battery, both



Steering Linkages of Great Strength.

as the source of energy, and a "step-up transformer" is employed in common between them. In any event, with ample motors and light cars rolling on wheels of big diameter, it would seem as if the ignition question is quite well settled.

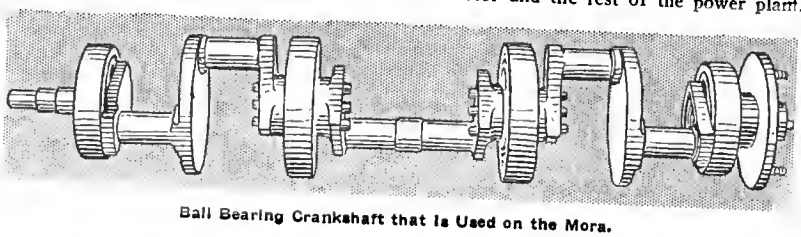
Fuel Systems.—Gasoline is still the liquid fuel, in spite of all the talk that went the rounds bering upon the question of the availability of alcohol. Carbureters are water-jacketed to a considerable extent, the idea being to run the hot water from the exhaust into the jacket of the carbureter to absorb the latent heat in the fuel that manifests itself during the period of evaporation, retarding the rate of evaporation. In some cases, as formerly, hot air is used. In only one or two instances is the formality dispensed with. Automatic carbureters have not made the headway that was promised for them and the auxiliary air supply is still with us. There is some evidence of what may be called "carbureter complication," but it is quite limited, and of justification there may be ample; one cannot tell at the show. Gasoline tanks are of liberal size, which, however, is not a compliment. The tanks are very well made, and the piping is quite healthy in most cases, with here and there a car in which so much is given at the price that the piping shows evidence of "skimping."

Lighting Systems.—Gas tanks are as thick as fleas on a dog's back, and they vie with the generators for supremacy. Let it not be supposed, however, that they are having it their own way. Generators are to be seen in great numbers, and they are not all on the low-priced cars. In other words, it is an even break, with little chance of either system falling far below the high estate they now lay claim to. Piping for the gas is not so good.

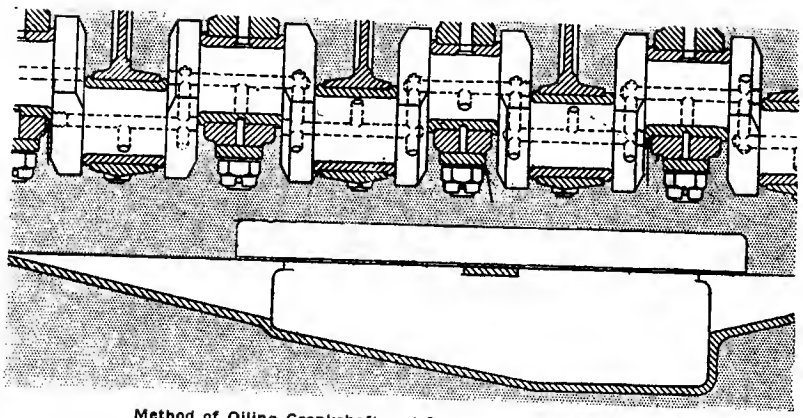
Of the lamps, too much cannot be said for them. They are in fine taste, there is a wide range to choose from, and for lighting (which is what they are there for) it is believed they are more capable than they ever were before. On the low-priced cars, die-forged (steel) brackets are used: they are capable, but it cannot be said of the cast bronze kind that they are quite so good as die-forged steel, which can be rendered as brass if they are "roll-plated," as they are in the fine examples to be seen. The oil lamps that look like "hearse lights" (as some wag put it) do cut a shine, and in the nighttime they keep it up. The question of electric lighting is one that we have not heard the last of. This method of lighting is forging to the fore, and it has a legitimate zone. Batteries are now so good that to use them for lighting, as well as the ignition system, is the natural thing to do. It is being done.

Tops and Windshields.—In the touring car class, "cape tops" are much in vogue, and they have reached a high state of development. They, with windshields and curtains, go a long way toward rendering touring under inclement conditions of weather less to be dreaded than ever before. The windshields have more of the "dodger" principle than formerly, and they do not rattle. The tops are not only in good style, but they are well made; broken bows should be of the past.

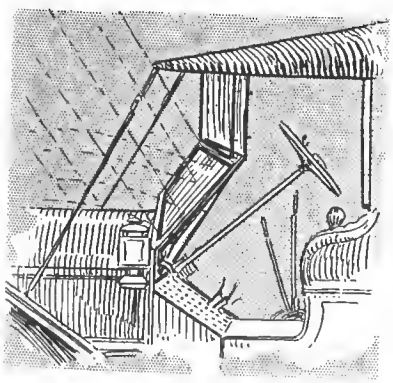
Underpans.—If it is desirable to protect the autoist from the ills of inclement weather, it is equally desirable to keep mud accumulations from the motor and the rest of the power plant.



Ball Bearing Crankshaft that Is Used on the Mora.



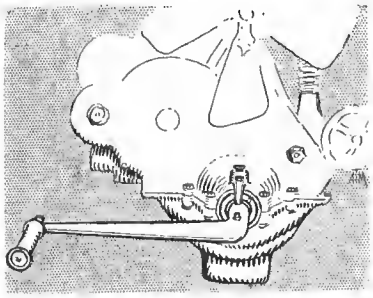
Method of Oiling Crankshaft and Sump to Prevent Splash.



Clear Vision Windshield on Gaeth.

This is looked after in a fitting manner, and the mud aprons (pans) are not only capable but they are easy to drop down, in order to be able to get at the machinery in the event necessity dictates. In this connection, it may not be out of place to call attention to the year's offerings by way of adequate mudguards, which is a matter that was never before on a fitting basis. As it is, the mudguards extend down to the chassis (frame) and the amount of protection they thus afford is only equalled by their neat appearance. The fellow that invented the "flaring mudguard" was helped enormously by the other fellow that added the mud drip, but the idea of extending the mudguards down to the chassis (frame) was the one that capped the climax.

Noise and Lubrication.—Both subjects will be treated in common, on the ground that in the absence of one, the other will render itself manifest. The absence of oil will at first show by a squeak. In the long run the squeak will propagate a rattle. Lubrication, then, is important, and it is pointed out that no amount of oil in the crankcase, for illustration, will be of avail when it comes to preventing rattle in the multitudinous small parts and in and about the chassis. If oil cannot be used, a

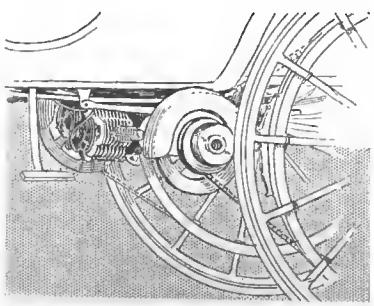


Means for Holding Starting Crank.

grease cup can. If the parts are coated with oil or grease, "grit" will be warded off, and noise will not creep in. If a squeak is an indication of a dry surface, rattle tells of the fact that the squeak fell on dull ears. At all events, it cannot now be said of the builders of cars that they failed to do their part, for in about every case the oiling question has been treated seriously. The systems are not all the same; all the designers did not reach exactly the same conclusions; but they all seemed to be alive to the facts, and all made a stagger at a solution of the problem, to say the least. It was a good stagger, too; the end was a complete solution of the problem in the great majority of cases. It is nice to see universal joints protected from dirt and oiled. This year's cars are nice in this respect. Grease cups are used to a large extent. Grease may now be had in which the lubricating qualities are equal to the same qualities in any fine lubrication oil. A clean dash is in style; this comes through the use of force feed oilers, aided by the fact that magnetos are used for the ignition systems. A couple of tell-tales and a coil are all to be seen on the dash these days; not always the coil, for the same is ofttimes placed elsewhere, with the idea of keeping the dash free of incumbrances.

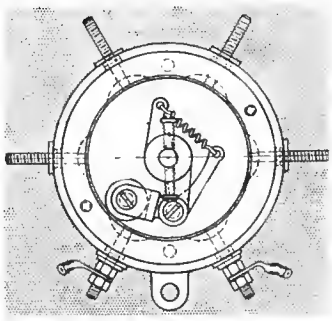
Cooling Systems.—Radiators are in several styles, as honeycomb, vertical tube, horizontal tube, and flat plate, or plates of thin copper fashioned in imitation of the honeycomb type. Then there is the round tube radiator, as used on some of the fine examples of cars. At all events, it is to note a fine display of radiators, and of pumps for the circulation of water there is the centrifugal and the gear pump, not forgetting some flat "paddle" types to boot. In notable instances the thermo-syphon principle is used, and on the whole the cooling question is handled so that few indeed are the cars that are troubled with steaming radiators or hot motors. Of the piping, it is assured that a better condition prevails. Within the water jackets of the cylinders much has been done to eliminate trouble, and it is a noteworthy fact that cooling is less in need, which is another way of saying that the amount of heat to be wiped out of the water is reduced and the radiators have less work to do, hence the tendency to steam is reduced. The improvement, then, has been in two directions.

Harmony of Relation.—Considering the power of the motors and the weights of the cars, it is to note that harmony resides in the 1909 products as it never before made bold to proclaim itself. This is a detail that was not taken account of to any great extent until recent times, and when designers awakened to the seriousness of the question it is fair of them to say they allowed no grass to grow under their feet. In many cases, this same harmony was a natural conclusion, but some of the overpowered cars were the sufferers, as were the runabout types that sported touring bodies in the early days. The time was when to note a body that weighed more than the chassis was as common as it is scarce to-day. If a chain is as strong as its weakest link, it is assured that some of the earlier products were very weak indeed. Thanks to experience and opportunity, this matter has been taken care of.



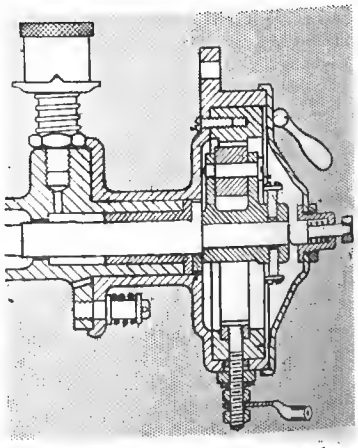
Holsman Method of Cable Drive.

Attention to Details.—In divers ways the details that formerly gave trouble in the long run, if not very early in the process, are reduced to a sane basis. The earlier failures were, in a large measure, due to a desire to inflict something distinctive on the user of cars, perhaps passing by devices that were known to be good for the purpose. Take, for illustration, timers: they should be stable and electrically suited to the exacting service required of them; they are as they obtain on the cars at the show as they never were before, due to a better understanding of the requirements in the hands of men of skill. Consider, for instance, the question of the lubrication of the timer; how many examples of no provision to be found in old models will never be known, while in the work of the year this question has been worked out to a nicety. Now the hard lubricants available are dependable if they are purchased of the companies that make a specialty of this class of trade and who know the needs as they now exist.



Roller Contact, Spring Tension Timer.

Cost of Maintenance.—The time was when the cost of maintenance of an automobile was regarded as a bar to the ownership of a car at any price because the purchase price was, as some said, the easiest part of it. This matter was disposed of to a large extent in the earlier examples of the better makes of cars, but the 1909 products are quite generally to be included in the list of the cars with a low cost of maintenance. The reason for this lies in the fact that the vendors of materials, knowing the wants of one, have the same information to give to all; and it takes but a little time in connection with a matter of this sort to level the situation. The cost of maintenance should be very low, indeed, in view of the standardized condition of the industry, and in further view of the general use of suitable materials, such as found their way into but few of the automobiles at first on account of the high cost, a question now disposed of by mere force of quantity.



Good Lubrication on Timer and Bearing.

Absence of Complication.—Users of cars soon learn how to control automobiles if such are mechanically as simple as can be. The time was when numerous mysterious trinkets were dangled from supports all through the then "half-baked" products, but the designers of acumen soon learned how to do without such useless complications, and they stayed at it until they had done away with the devices that lent zest to the efforts of "astronomers" who crawled under cars, thereafter to gaze toward the canopy of Heaven through a dark and dismal aggregation of levers and other things that intercepted the line of vision. As it is, there is no reason for going under a car, even if something does need a little attention. It can be reached from

The Automobile Calendar for 1909

Dec. 31–Jan. 7...New York City, Grand Central Palace, A. M. C. M. A. Show.

Jan. 5.....New York City, Fourth Annual Meeting Society of Automobile Engineers

Jan. 16–23.....New York City, Madisoo Square Gardco, A. L. A. M Show.

Jan. 27–Feb. 3....Philadelphia, Second Regiment Armory, Philadelphia A. T. A. Show.

Feb. 6–13.....Chicago, Coliseum-1st Regt. Armory, N.A.A.M. Show.

Feb. 15–20.....St. Louis, St. Louis A.M.D.A, Show.

Feb. 15–20.....Detroit, Detroit A.D.A.Show.

Feb. 15–20.....Cleveland, Clevelaod A.D.C. Show

Feb. 16–18.....Denver, Deover M. C. Show.

Feb. 18–25.....Toronto, Oot. Annual Show.

Feb. 20–27.....Newark, N. J., New Jersey A. T. A. Show.

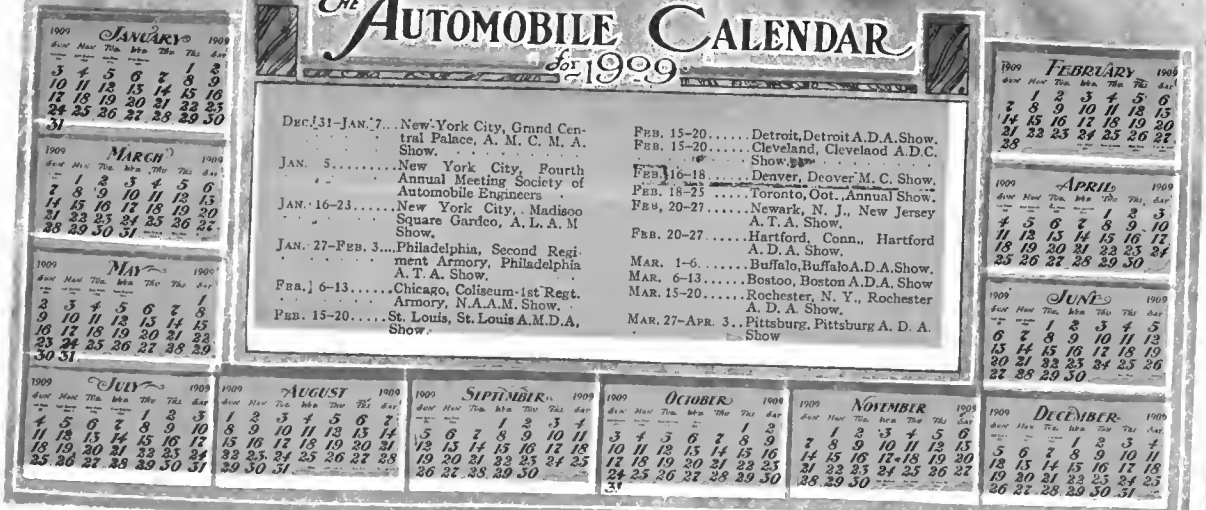
Feb. 20–27.....Hartford, Conn., Hartford A. D. A. Show.

Mar. 1–6.....Buffalo, Buffalo A.D.A.Show.

Mar. 6–13.....Bostoo, Boston A.D.A. Show

Mar. 15–20.....Rochester, N. Y., Rochester A. D. A. Show.

Mar. 27–Apr. 3..Pittsburg, Pittsburg A. D. A. Show



CAR COSTING $1,000 OR LESS

MAKE AND MODEL	Price	H.P.	BODY Type	Seats	MOTOR Cylinders	Bore	Stroke	COOLING Radiator	Pump	IGNITION Magneto	Battery	Lubrication	Clutch	TRANSMISSION Type	Speeds	Drive	Brakes	CONTROL Steering	WHEEL Base	Track	Frame	BEARINGS Motor	Transmission	Axle	Weight	TIRES Front	Rear
REO—"G"	$500	10	Runabout	2	1	4½	6	Tubular	Gear		Dry	Pump	Disc	Planetary	2	Chain	2	Worm & Sector	78	56	Pressed Steel					28x3	28x3
MAXWELL—A	500	10	Ruoabout	2	2	4	4	H'comb.	Thermo.		Dry		Disc	Planetary	2	Shaft	2	Pinion & Seg't.	82	56	Pressed Steel				1.100	28x3	28x3
BRUSH—B	550	7	Runabout	2	1	4	4		Thermo.		Dry		Disc	Planetary	2	Chains.	2		74	56	Wood				900	28x3	28x3
BRUSH—B	550	7	Runabout	2	1	4	4		Thermo.		Dry		Disc	Planetary	2	Chains.	2		74	56	Wood				900	32x2	32x3
ANDERSON—C	650	12	Runabout	2	2	4	4½	Air	Air		Dry	Forcefeed	Disc	Planetary	3	Chain	2	Worm	70	56				Roller	900	30x3	30x3
GYROSCOPE	750	16	Optional		2	4½	4½	H'comb.	Thermo.		Dry	Forcefeed		Friction		Shaft	2	Irreversible	95	56	Pressed Steel	Roller	Roller & Ball	Roller & Ball	1,500	30x3	30x3
LAMBERT—A-1	800	20	Runabout	2	2	5	4	H'comb.			Dry			Friction		Chain	2	Screw & Nut	95	56	Pressed Steel				1.350	30x3	30x3
GYROSCOPE	800	16	Roadster		2	4½	4½	H'comb.	Thermo.		Dry	Forcefeed		Friction		Shaft	2	Irreversible	95	56	Pressed Steel	Roller	Roller & Ball	Roller & Ball	1.500	30x3	30x3
MAXWELL—L-B	850	14	Runabout	2	2	4½	4	H'comb.	Thermo.	Magneto	Storage		Mul. Disc	Planetary	2	Shaft	2	Pinion & Seg't.	84	56	Pressed Steel				1.150	30x3	30x3
FORD—T	850	20	Touring	5	4	3¾	4		Centrif'l.	Magneto			Mul. Disc	Planetary	2	Shaft	3	Irreversible	100	56	Pressed Steel				1,200	30x3	30x3½
JACKSON—F	850	16–18	Runabout	2	2	5	4	H'comb.	Thermo.		Dry		Mul. Disc	Planetary	2	Shaft	2		96	56	Pressed Steel				1.600	30x3½	30x3½
JACKSON—K	850	16–18	Touring	4	2	5	4	H'comb.	Thermo.		Dry		Mul. Disc	Planetary	2	Shaft	2		96	56	Pressed Steel				1.600	30x3½	30x3½
MIDDLEBY—A or B	850	25	Optional	2 or 4	4	4	4	Air	Air	Splitdorf	Dry	Forcefeed	Cone	Progressive	3	Shaft	4	Irreversible	108	56	Armored W'd	White Br.	White Br.	Roller	1,750	32x3½	32x3½
LAMBERT—A-3	875	20		4	2	5	4	H'comb.			Dry			Friction		Chain	2	Screw & Nut	95	56	Pressed Steel				1.400	30x3	30x3
CAMERON—14	900	20–24	Runabout	2	4	3½	3½	Air	Air	Remy	Dry	Gear	Int. Cone	Selective	3	Shaft	4	Rack & Pinion	96	56	Steel	P. White Br.	Ball	Ball	1.200	30x3	30x3
FORD—T	950	20	Coupe	3	4	3¾	4		Centrif'l.	Magneto			Mul. Disc	Planetary	2	Shaft	3	Irreversible	100	56	Pressed Steel				1.200	30x3	30x3½
CAMERON—14	950	20–24	Roadster	3	4	3½	3½	Air	Air	Remy	Dry	Gear	Int. Cone	Selective	3	Shaft	4	Rack & Pinion	96	56	Steel	P. White Br.	Ball	Ball	1.225	30x3	30x3
CAMERON—15	1000	20–24	Runabout	2	4	3¾	3½	Air	Air	Remy	Dry	Gear	Int. Cone	Selective	3	Shaft	4	Rack & Pinion	92	56	Steel	P. White Br.	Ball	Ball	1.100	32x3	32x3
MITCHELL—J	1000	20	Runabout	2	4	4	4	Cellular.	Gear		Dry		Cone	Selective	3	Shaft	4	Irreversible	92	56	Pressed Steel				1.700	32x3½	32x3½
REO—H-R	1000	20–22		4	2	4½	6	Tubular.	Gear.		Storage		Mul. Disc	Planetary	2	Chain	3	Worm & Sector	96	56	Pressed Steel					32x3½	32x3½
REO—D	1000	20–22		5	2	4½	6	Tubular.	Gear.		Storage		Mul. Disc	Planetary	2	Chain	3	Worm & Sector	96	56	Pressed Steel					32x3½	32x3½
CARTERCAR—H	1000	18–20	Runabout	4	2	4½	4½	Tubular.	Thermo		Dry			Friction		Chain	3	Pinion & Sector	94	56	Pressed Steel					32x3	32x3
FORD—T	1000	20	Town Car	5	4	3¾	4		Centrif'l.	Magneto			Mul. Disc	Planetary	2	Shaft	3	Irreversible	100	56	Pressed Steel				1.400	30x3	30x3½
FORD—T		20	Runabout	2	4	3¾	4		Centrif'l.	Magneto			Mul. Disc	Planetary	2	Shaft	3	Irreversible	100	56	Pressed Steel				1.100	30x3	30x3½
FORD—T		20	Roadster	3	4	3¾	4		Centrif'l.	Magneto			Mul. Disc	Planetary	2	Shaft	3	Irreversible	100	56	Pressed Steel				1.100	30x3	30x3½
FORD—T		20	Tourabout	4	4	3¾	4		Centrif'l.	Magneto			Mul. Disc	Planetary	2	Shaft	3	Irreversible	100	56	Pressed Steel				1.200	30x3	30x3½

CARS COSTING BETWEEN $1,000 AND $1,500

MAKE AND MODEL	Price	H.P.	BODY Type	Seats	MOTOR Cylinders	Bore	Stroke	COOLING Radiator	Pump	IGNITION Magneto	Battery	Lubrication	Clutch	TRANSMISSION Type	Speeds	Drive	Brakes	CONTROL Steering	WHEEL Base	Track	Frame	BEARINGS Motor	Transmission	Axle	Weight	TIRES Front	Rear
CAMERON—16	$1100	20–24	Roadster	4	4	3½	3½	Air	Air	Remy	Dry	Gear	Int. Cone	Selective	3	Shaft	4	Rack & Pinion	100	56	Steel	P. White Br.	Ball	Ball	1.350	30x3½	30x3½
CAMERON—16	1100	20–24	Touring	5	4	3½	3½	Air	Air	Remy	Dry	Gear	Int. Cone	Selective	3	Shaft	4	Rack & Pinion	100	56	Steel	P. White Br.	Ball	Ball	1,400	30x3½	30x3½
OAKLAND—20-A	1200	20		3	2	4½	5	Tubular		Magneto	Storage	Forcefeed	Mul. Disc	Planetary	2	Shaft	4	Epicyclic	100	56	Pressed Steel				1 700	32x3½	32x3½
OAKLAND—20-B	1250	20		4	2	4½	5	Tubular		Magneto	Storage	Forcefeed	Mul. Disc	Planetary	2	Shaft	4	Epicyclic	100	56	Pressed Steel				1.740	32x3½	32x3½
OAKLAND—20-C	1250	20		4	2	4½	5	Tubular		Magneto	Storage	Forcefeed	Mul. Disc	Planetary	2	Shaft	4	Epicyclic	100	56	Pressed Steel				1.720	32x3½	32x3½
REGAL—B	1250	30	Runabout	3	4	4	4	Tubular		Magneto	Storage	Pump	Cone	Selective	3	Shaft	4	Worm & Nut	105	56	Pressed Steel	Ball	Roller	Roller	1.700	32x3½	32x3½
REGAL—A	1250	30	Touring	5	4	4	4	Tubular		Magneto	Storage	Pump	Cone	Selective	3	Shaft	4	Worm & Nut	105	56	Pressed Steel	Ball	Roller	Roller	1.900	32x3½	32x3½
OVERLAND—30	1250	30	Runabout	3	4	4	4	Tubular	Thermo.	Remy	Dry	Forcefeed	Cone	Planetary	2	Shaft	4	Worm & Sector	108	56	Pressed Steel	White Br.	Hyatt	Hyatt & Ball	1.600	32x3½	32x3½
JACKSON—C	1250	20–24	Touring	5	2	5½	5	H'comb.	Thermo.	Magneto	Storage		Mul. Disc	Planetary	2	Chain	2		104	56	Pressed Steel				2.000	32x3½	32x3½
ATLAS (Two Cycle)—R	1250	22	Runabout	2	2	4½	4½	Tubular			Dry		Cont'g B'd.	Sliding		Shaft	3	"Gemmer"	90	56	Ash				1.500	30x3½	30x3½
LAMBERT—27	1250	28		4	4	4	4	H'comb.			Storage			Friction		Chain	2	Screw & Nut	110	56	Pressed Steel				1.500	30x3½	30x3½
LAMBERT.30	1250	28		5	4	4	4	H'comb.			Storage			Friction		Chain	2	Screw & Nut	110½	56	Pressed Steel				1.600	30x3½	30x3½
BLACK—40	1250	40	Touring	5	4	4½	4½	Air	Air	Magneto	Dry	Mech	Warner	Sliding	3	Shaft	4	Wheel	112	56	Steel	Bronze	Roller	Roller	1.750	38	38
OVERLAND—30	1300	30	Runabout	4	4	4	4½	Tubular	Thermo.	Remy	Dry	Forcefeed	Cone	Planetary	2	Shaft	4	Worm & Sector	105	56	Pressed Steel	White Br.	Hyatt	Hyatt & Ball	1.735	32x3½	32x3½
MAXWELL—Dr	1350	20	Runabout	2	2	5	5	H'c'omb	Thermo.	Magneto	Storage		Mul Disc	Sliding	3	Shaft	4	Pinioo & Seg't.	96	56	Pressed Steel				1,700	30x3½	30x3½
CARTERCAR—K	1350	22–24	Touring	5	2	5½	4½	Tubular	Thermo.		Dry			Friction		Chain	3	Pinion & Sector	103	56	Pressed Steel					32x3½	32x3½
CARTERCAR—G	1350	22–24	Roadster	4	2	5½	4½	Tubular	Thermo		Dry			Friction		Chain	3	Pinion & Sector	103	56	Pressed Steel					32x2½	32x2½
KISSEL KAR—LD-9	1350	30	Roadster	5	4	4½	4½	Tubular	Centrif'l.	Remy	Dry	Meeh	Cone	Selective	3	Shaft	4	Worm & Sector	107	56	Steel	White Metal	Timken	Timken	2.000	32x3½	32x3½
OVERLAND—31	1400	30	Optional		4	4	4½	Tubular	Centrif'l.	Remy	Dry	Force	Cone	Planetary	2	Shaft	4	Worm & Sector	110	56	Pressed Steel	White Br.	Hyatt	Hyatt & Ball	1.600	34x3½	34x3½
MAXWELL—HD	1450	20	Touring	5	2	5	5	H'comb.	Thermo.	Magneto	Storage		Mul. Disc	Sliding	3	Shaft	4	Pinion & Seg't.	96	56	Pressed Steel				1.700	30x3½	30x3½
OVERLAND—32	1500	32	Runabout	4	4	4	4½	Tubular	Thermo.	H. T. Mag.	Storage	Forcefeed	Cone	Selective	3	Shaft	4	Worm & Sector	110	56	Pressed Steel	White Br.	Ball	Ball	1.950	34x3½	34x3½
OVERLAND—32	1500	32	Toy Tonneau	4	4	4	4½	Tubular	Thermo.	H. T. Mag.	Storage	Forcefeed	Cone	Selective	3	Shaft	4	Worm & Sector	110	56	Pressed Steel	White Br.	Ball	Ball	2.000	34x3½	34x3½
OVERLAND—32	1500	32	Touring	5	4	4	4½	Tubular	Thermo.	H. T. Mag.	Storage	Forcefeed	Cone	Selective	3	Shaft	4	Worm & Sector	110	56	Pressed Steel	White Br.	Ball	Ball	2.100	34x3½	34x3½
KISSEL KAR—LD-9	1500	30	Baby Ton	4	4	4½	4½	Tubular	Centrif'l.	Remy	y	Mech	Cone	Selective	3	Shaft	4	Worm & Sector	107	56	Steel	White Metal	Timken	Timken	2.000	32x3½	32x3½
KISSEL KAR—LD-9	1500	30	Touring	5	4	4½	4½	Tubular	Centrif'l.	Remy	y	Mech	Cone	Selective	3	Shaft	4	Worm & Sector	107	56	Steel	White Metal	Timken	Timken	2.000	33x4	33x4
MITCHELL—K	1500	28–30	Det. Tonneau	5	4	4½	4½	Cellular.	Gear	Magneto	y		Cone	Selective	3	Shaft	4	Irreversible	105	56	Pressed Steel				2.300	32x4	32x4
PULLMAN—L	1500	20	Runabout	3	4	3½	3½	Tubular			St & D'y		Cone	Selective	3	Shaft	3	Irreversible	102	56	Pressed Steel				1,750	32x3½	32x3½
STODDARD-D'T'N—9-H	1500	25	Runabout	2 or 4	4	3½	4½	Tubular		Magneto	Storage		Cone	Selective	3	Shaft	4	Worm & Nut	103	56½	Pressed Steel				1.700	32x3½	32x3½
CAMERON—11	1500	36	Roadster	3	6	3½	3½	Air	Air	Remy	Dry	Gear	Cone	Selective	3	Shaft	4	Rack & Pinion	112	56	Steel	P. White Br.	Ball	Ball	1.600	34x3½	34x3½
CAMERON—11	1500	36	Roadster	4	6	3½	3½	Air	Air	Remy	Dry	Gear	Cone	Selective	3	Shaft	4	Rack & Pinion	112	56	Steel	P. White Br.	Ball	Ball	1.625	34x3½	34x3½
CAMERON—11	1500	36	Touring	5	6	3½	3½	Air	Air	Remy	Dry	Gear	Cone	Selective	3	Shaft	4	Rack & Pinion	112	56	Steel	P. White Br.	Ball	Ball	1.650	34x3½	34x3½
MOLINE—M	1500	24	Touring	5	4	3½	4½	Tubular	Thermo.		Storage		Cone	Selective	3	Option	3	Irreversible	116	56	Pressed Steel				2.000	34x3½	34x3½
GEARLESS—35	1500	35	Optional	4 or 5	4	4½	4½	H'comb.		Splitdorf	Storage		Cont. Ring	Friction		Chains	2	Worm & Nut	119	56	Pressed Steel				2.400	36x3½	36x3½

CARS COSTING BETWEEN $1,500 AND $2,000

MAKE AND MODEL	Price	H.P.	BODY Type	BODY Seats	MOTOR Cylinders	MOTOR Bore	MOTOR Stroke	COOLING Radiator	COOLING Pump	IGNITION Magneto	IGNITION Battery	Lubrication	Clutch	TRANSMISSION Type	TRANSMISSION Speeds	TRANSMISSION Drive	CONTROL Brakes	CONTROL Steering	WHEEL Base	WHEEL Track	Frame	BEARINGS Motor	BEARINGS Transmission	BEARINGS Axle	Weight	TIRES Front	TIRES Rear
OAKLAND—40-F	$1600	40		2	4	4½	5	Tubular		Optional	Storage		Mul. Disc. e	Sliding	3	Shaft	4	Epicyclic	112	56	Pressed Steel				2,025	34x4	34x4
OAKLAND—40-H	1600	40		4	4	4½	5	Tubular		Optional	Storage		Mul. Disc	Sliding	3	Shaft	4	Epicyclic	112	56	Pressed Steel				2,050	34x4	34x4
OAKLAND—40-G	1600	40		5	4	4½	5	Tubular		Optional	Storage		Mul. Disc	Sliding	3	Shaft	4	Epicyclic	112	56	Pressed Steel				2,100	34x4	34x4
JACKSON—H	1600	30	Roadster	4	4	4½	4½	H'comb.	Thermo.	Magneto	Storage		Mul. Disc	Sliding	3	Shaft	4		110	56	Pressed Steel				2,300	32x4	32x4
JACKSON—H	1600	30	Touring	5	4	4½	4½	H'comb.	Thermo.	Magneto	Storage		Mul. Disc	Sliding	3	Shaft	4		110	56	Pressed Steel				2,400	32x4	32x4
GEARLESS—Olympic	1650	35	Optional	4 or 5	4	4½	4½	H'comb.		Splitdorf	Storage		Cont. Ring	Selective	3	Shaft	2	Worm & Nut	119	56	Pressed Steel				2,400	36x3½	36x3½
MAXWELL—KA	1750	24–30	Runabout	3	4	4½	4½	H'comb.	Thermo.	Magneto	Storage		Mul. Disc	Sliding	3	Shaft	4	Pinion & Seg't.	104	56	Pressed Steel				1,800	32x4	32x4
MAXWELL—DA	1750	24–30	Touring	5	4	4½	4½	H'comb.	Thermo.	Magneto	Storage		Mul. Disc	Sliding	3	Shaft	4	Pinion & Seg't.	104	56	Pressed Steel				2,100	32x4	32x4
LAMBERT—19	1750	35–40		5	4	4½	5	H'comb.		H. T. Mag.	Storage			Friction		Chain	2	Screw & Nut	105	56	Pressed Steel				1,900	32x3½	32x3½
INTERSTATE—25	1750	35–40	Optional		4	4½	5	Tubular.	Centrif'l.	Eisemann	Coil	Pump	Mul. Disc.	Selective	3	Shaft	4	Wheel	112	56	Pressed Steel.	P. White Br.	Ball	Roller	2,200	34x4	34x4
BENNER	1750	25–30	Roadster	2	6	3½	4	Tubular.	Centrif'l.		Dry	Pump	Mul. Disc.	Sliding	2	Shaft	4	Brown-Lipe	100	56	Pressed Steel.	Bronze	Plain	Ball & Roller	1,900	32x3	32x3½
McCUE	1800	30	Runabout	5	4	4½	4½					Pump	Cone	Selective	3	Shaft	4	Worm	108	56	Pressed Steel.	Plain	Ball	Ball	1,885	36x4	36x4
BENNER	1800	25–30	Roadster	4	6	3½	4	Tubular	Centrif'l.		Dry	Pump	Mul. Disc	Sliding	2	Shaft	4	Brown-Lipe	100	56	Pressed Steel.	Bronze	Plain	Ball & Roller	1,900	32x3	32x3½
MIDLAND—E	1800	25–30	Toy Tonneau	4	4	4½	5	Tubular			Storage		Mul. Disc	Selective	3	Shaft	4	Nut & Screw	110	56	Pressed Steel				2,000	34x3½	34x3½
KISSEL KAR—LD-9	1800	30	Coupe		4	4½	4½	Tubular.	Centrif'l.	Remy	Dry	Mech.	Cone	Selective	3	Shaft	4	Worm & Sector	107	56	Steel	White Metal	Timken	Timken		32x3½	32x3½
ATLAS (Two Cycle)—P	1800	33	Runabout	2 or 4	3	4½	4½	Tubular		Atw'r-K't.	Atw'r-K		Cont. Band	Selective	3	Shaft	3	Irreversible	110	56	Pressed Steel				2,000	30x4	30x4
LANE (Steamer)—14	1800	20	Runabout	3	2							Splash				Chain	3		97	56	Steel	Roller			2,250	32x4	32x4
MORA—Light Four	1850	24–28	Racy-Type	4	4	4	5½	Tubular			Storage		Cone	Selective	3	Shaft	4	Bevel Gears	110	56	Pressed Steel				1,900	32x4	32x4
MORA—Light-Four	1850	24–28		4	4	4	5½	Tubular			Storage		Cone	Selective	3	Shaft	4	Bevel Gears	110	56	Pressed Steel				2,000	32x4	32x4
ATLAS (Two Cycle)—P	1850	33	Touring	5	3	4½	4½	Tubular		Atw'r-K't.	Atw'r-K		Cont. Band	Selective	3	Shaft	4	Irreversible	110	56	Pressed Steel				2,400	32x4	32x4
BENNER	1850	25–30	Toy Tonneau	4	6	3½	4	Tubular	Centrif'l.		Dry	Pump	Mul. Disc	Sliding	2	Shaft	4	Brown-Lipe	100	56	Pressed Steel	Bronze	Plain	Ball & Roller	1,900	32x3	32x3½
JACKSON—E	2000	35	Roadster	4	4	4½	4½	H'comb.	Thermo.	Magneto	Storage		Mul. Disc	Sliding	3	Shaft	4		111	56	Pressed Steel				2,600	34x4	34x4
JACKSON—E	2000	35	Touring	5	4	4½	4½	H'comb.	Thermo.	Magneto	Storage		Mul. Disc	Sliding	3	Shaft	4		111	56	Pressed Steel				2,700	34x4	34x4
STODDARD-D.—9-C	2000	35	Roadster	4	4	4	5	Tubular		Magneto	Storage		Cone	Selective	3	Shaft	4	Worm & Nut	110½	56	Pressed Steel				2,000	34x3½	34x3½
STODDARD-D.—9-A	2000	35	Touring	5	4	4	5	Tubular		Magneto	Storage		Cone	Selective	3	Shaft	4	Worm & Nut	105	56	Pressed Steel				2,200	34x3½	34x3½
PULLMAN—K	2000	30	Touring	5	4	4½	4½	Tubular		Magneto	Dry		Cone	Selective	3	Shaft		Irreversible	106	56	Pressed Steel				2,250	34x3½	34x4
MITCHELL—L	2000	35–40	Touring	7	4	4½	5	Cellular		Magneto	Dry		Cone	Selective	3	Shaft		Irreversible	122	56	Pressed Steel				2,700	34x4	34x4
OVERLAND—"34"	2000	35	Runabout	4	6	3½	4½	Tubular	Thermo.	H. T. Mag.	Storage	Forcefeed	Cone	Selective	3	Shaft	4	Worm & Sector	116	56	Pressed Steel	White Br.	Ball	Ball	2,200	34x3½	34x3½
OVERLAND—34	2000	35	Roadster	4	6	3½	4½	Tubular	Thermo.	H. T. Mag	Storage	Forcefeed	Cone	Selective	3	Shaft	4	Worm & Sector	116	56	Pressed Steel	White, Br.	Ball	Ball	2,200	34x3½	34x3½
OVERLAND—34	2000	35	Touring	5	6	3½	4½	Tubular	Thermo.	H. T. Mag	Storage	Forcefeed	Cone	Selective	3	Shaft	4	Worm & Sector	116	56	Pressed Steel	White Br.	Ball	Ball	2,200	34x3½	34x3½
LAMBERT—B-2	2000	35–40	Touring	7	4	4½	5	H'comb.		H. T. Mag	Storage			Friction		Chains	2	Serew & Nut	106	56	Pressed Steel				2,700	32x4	32x4
PENNSYLVANIA—D-25	2000	28.9		2	4	4½	4½	H'comb.		Magneto			Cone	Selective	3	Shaft	4	Worm & Sector	110	56	Pressed Steel				2,200	32x4	32x4
KISSEL KAR—D-9	2000	40	Roadster		4	4½	4½	Tubular	Gear	Remy	Dry	Mech.	Cone	Selective	3	Shaft	4	Worm & Sector	115	56	Steel	White Metal	Timken	Timken	2,600	36x3½	36x4
KISSEL KAR—D-9	2000	40	Baby Ton		4	4½	4½	Tubular	Gear	Remy	Dry	Mech.	Cone	Selective	3	Shaft	4	Worm & Sector	115	56	Steel	White Metal	Timken	Timken		36x3½	36x4
KISSEL KAR—D-9	2000	40	Touring	5	4	4½	4½	Tubular	Gear	Remy	Dry	Mech.	Cone	Selective	3	Shaft	4	Worm & Sector	115	56	Steel	White Metal	Timken	Timken		36x3½	36x4
McCUE	2000	30	Roadster	4	4	4½	4½			Magneto	Dry	Mech.	Cone	Selective	3	Shaft	4	Worm	116	56	Pressed Steel	Plain	Ball	Ball	2,020	36x4	36x4
LANE (Steamer)—15	2000	20	Touring	5	2							Splash				Chain	3		103	56	Steel	Roller			2,400	32x4	32x4

CARS COSTING BETWEEN $2,000 AND $3,000

MAKE AND MODEL	Price	H.P.	BODY Type	BODY Seats	MOTOR Cylinders	MOTOR Bore	MOTOR Stroke	COOLING Radiator	COOLING Pump	IGNITION Magneto	IGNITION Battery	Lubrication	Clutch	TRANSMISSION Type	TRANSMISSION Speeds	TRANSMISSION Drive	CONTROL Brakes	CONTROL Steering	WHEEL Base	WHEEL Track	Frame	BEARINGS Motor	BEARINGS Transmission	BEARINGS Axle	Weight	TIRES Front	TIRES Rear
PENNSYLVANIA—D-25	$2100	28.9		4	4	4½	4½	H'comb.		Magneto			Cone	Selective	3	Shaft	4	Worm & Sector	110	56½	Pressed Steel				2,350	32x4	32x4
PENNSYLVANIA—D-25	2100	28.9	Touring	4	4	4½	4½	H'comb.		Magneto			Cone	Selective	3	Shaft	4	Worm & Sector	110	56½	Pressed Steel				2,400	32x4	32x4
McCUE	2200	30	Touring	5	4	4½	4½			Magneto	Dry	Mech.	Cone	Selective	3	Shaft	4	Worm	116	56	Pressed Steel	Plain	Ball	Ball	2,200	36x4	36x4
MIDLAND—G	2250	30–35	Optional	5	4	4½	5½	Tubular		Magneto	Dry		Mul. Disc	Selective	3	Shaft	4	Screw & Nut	112	56	Pressed Steel				2,650	34x4	34x4
KISSEL KAR—D-9	2300	40	Close C'pled		4	4½	4½	Tubular	Gear	Remy	Dry	Mech.	Cone	Selective	3	Shaft	4	Worm & Sector	115	56	Steel	White Metal	Timken	Timken	2,300	36x3½	36x4
MARMON—32	2400	32–40	Runabout	4	4	4½	4½	Cellular		H. T. Mag.	Storage		Expanding	Selective	3	Shaft	4	Screw & Nut	112	56	Pressed Steel				1,975	34x3½	34x3½
MARMON—32	2400	32–40		4	4	4½	4½	Cellular		H. T. Mag.	Storage		Expanding	Selective	3	Shaft	4	Screw & Nut	112	56	Pressed Steel				1,975	34x3½	34x3½
MARMON—32	2400	32–40	Touring	5	4	4½	4½	Cellular		H. T. Mag.	Storage		Expanding	Selective	3	Shaft	4	Serew & Nut	112	56	Pressed Steel				1,975	34x3½	34x3½
COATES-GOSHEN—25	2450	25	Runabout	4	4	4	4	Cellular	Gear	Bosch	Storage	Splash	Cone	Selective	3	Shaft	4	Double Serew	112	56½	Pressed Steel	Plain	H-B	Timken	2,200	36x3½	36x3½
PREMIER—30	2500	30–35	Runabout	4	4	4½	4½	Cellular			Storage		Mul. Disc	Selective	3	Shaft	4	Worm & Nut	114	56½	Pressed Steel				2,600	34x3½	34x4
PREMIER—30	2500	30–35	Touring	5	4	4½	4½	Cellular			Storage			Selective	3	Shaft	4	Worm & Nut	120	56½	Pressed Steel				2,650	34x4	34x4
STODDARD-D.—9-K	2500	45	Runabout	4	4	4½	5	Tubular		Magneto	Storage		Cone	Selective	3	Shaft	4	Worm & Nut	120	56½	Pressed Steel				2,700	34x4	34x4
STODDARD-D.—9-P	2500	45	Touring	7	4	4½	5	Tubular		Magneto	Storage		Cone	Selective	3	Shaft	4	Worm & Nut	113½	56½	Pressed Steel				3,000	34x4	34x4
ACME—XIX	2500	25	Runabout	2	4	4½	5	Tubular		Magneto	Storage		Cone	Selective	3	Shaft	4	Serew & Nut	96	56	Pressed Steel					34x4	34x4
ATLAS (Two Cycle)—T	2500	22	Town Car	5	2	4½	4½	Cellular			Dry		Cont. Band	Sliding		Shaft	3	Irreversible	100	56	P. S. or Wood				2,500	30x4	30x4
SPEEDWELL—M-C	2500	40	Roadster	3	4	4½	5	H'comb.		Bosch	Dry	Splash	Cone	Selective	3	Shaft	4	Worm & Gear	120	56	Pressed Steel	P. White Br.	Timken	Timken	2,400	34x4	34x4
SPREDWELL—M-D	2500	40	Touring	7	4	4½	5	H'comb.		Bosch	Dry	Splash	Cone	Selective	3	Shaft	4	Worm & Gear	120	56	Pressed Steel	P. White Br.	Timken	Timken	2,700	34x4	34x4
KISSEL KAR—G-9	2750	60	Roadster		6	4½	4½	Tubular	Centrif'l.	Bosch	Dry	Mech.	Cone	Selective	3	Shaft	4	Worm & Sector	130	56	Steel	White Metal	Timken	Timken	3,100	36x4	36x4½
KISSEL KAR—G-9	2750	60	Baby Ton		6	4½	4½	Tubular	Centrif'l.	Bosch	Dry	Mech.	Cone	Selective	3	Shaft	4	Worm & Sector	130	56	Steel	White Metal	Timken	Timken		36x4	36x4½
KISSEL KAR—G-9	2750	60	Touring	5	6	4½	4½	Tubular	Centrif'l.	Bosch	Dry	Mech.	Cone	Selective	3	Shaft	4	Worm & Sector	130	56	Steel	White Metal	Timken	Timken		36x4	36x4½
NATIONAL—9-35	2750	35	Optional		4	4½	4½	Special	Gear	Bosch	Storage		Cone	Selective	3	Shaft	4	Worm & Gear	115	56½	Pressed Steel				2,600	34x4	34x4
MORA—"Large-four"	2750	60	Racytype	4	4	6	6	Tubular		Magneto	Storage		Cone	Selective	3	Shaft	4	Nut & Screw	118	56	Pressed Steel				2,700	34x4	34x4
MORA—"Large-four"	2750	60	Touring	5	4	6	6	Tubular		Magneto	Storage		Cone	Selective	3	Shaft	4	Nut & Serew	118	56	Pressed Steel				2,700	34x4	34x4
PULLMAN—6-30	2750	30	Runabout	3	6	3½	3½	Tubular		Magneto	Dry		Cone	Selective	3	Shaft	4	Irreversible	104	56	Pressed Steel				1,900	34x3½	34x3½
GEARLESS—50	2750	50	Touring	5	4	5	5½	H'comb.		Magneto	Storage		Cont. Ring	Gearless			2		3		124	56	Pressed Steel					36x4	36x4½

MAKE AND MODEL	Price	H.P.	BODY Type	BODY Seats	MOTOR Cylinders	MOTOR Bore	MOTOR Stroke	COOLING Radiator	COOLING Pump	IGNITION Magneto	IGNITION Battery	Lubrication	Clutch	TRANSMISSION Type	TRANSMISSION Speeds	TRANSMISSION Drive	CONTROL Brakes	CONTROL Steering	WHEEL Base	WHEEL Track	Frame	BEARINGS Motor	BEARINGS Transmission	BEARINGS Axle	Weight	TIRES Front	TIRES Rear
CARS COSTING BETWEEN $2,000 AND $3,000—Continued																											
LANE (Steamer)—16	$2800	30	Roadster	3	2							Splash		Chain	3		112	56	Steel	Roller			3,100	36x4	36x4
AUSTIN—45	2850	45	Runabout	3	6	4½	4½	Tubular		Magneto	Storage		Mul. Oise	Selective	3	Shaft	4	Worm & Sector	122	54½	Alloy Steel				2,250	36x3½	36x3½
COATES-GOSHEN—32	2850	32	Runabout	4	4	4½	5	Cellular	Gear	Bosch	Storage	Splash	Cone	Selective	3	Shaft	4	Double Screw	116	56½	Pressed Steel	Plain	H-B	Timken	2,450	36x4	36x4
PULLMAN—4-40	3000	40	Runabout	3	4	5	5½	Tubular		Bosch	Ory		Cone	Selective	3	Shaft	4	Irreversible	106	56	Pressed Steel				2,300	36x4	36x4
AUSTIN—45	3000	45	Touring	5	6	4½	4½	Tubular		Magneto	Storage		Mul. Disc	Selective	3	Shaft	4	Worm & Sector	122	54½	Alloy Steel				2,350	36x3½	36x3½
SULTAN	3000	10–12	Landaulet	6	4	3	4½	Tubular		Bosch		Forcefeed	Disc	Progres've	3	Shaft	3	Worm & Sector	98½	53½	Pressed Steel	Plain	Ball	Ball	2 400	32x4	32x4
PENNSYLVANIA—C	3000	36	Runabout	4	4	4½	5½	Mayo		Magneto			Cone	Selective	3	Shaft	4	Worm & Nut	114	56½	Pressed Steel				2,800	34x4	34x4½
PENNSYLVANIA—C	3000	36	Touring	5	4	4½	5½	Mayo		Magneto			Cone	Selective	3	Shaft	4	Worm & Nut	114	56½	Pressed Steel				2,800	34x4	34x4½
KISSEL KAR—G-9	3000	60	Touring	7	6	4½	4½	Tubular	Centrif'l	Bosch	Dry	Mech	Cone	Selective	3	Shaft	4	Worm & Sector	130	56	Steel	White Metal	Timken	Timken	3,100	36x4	36x4½
MOON—C	3000	30–35	Runabout	4	4	4½	4½	H'comb	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	3	Shaft	4	Double Worm	112	56	Pressed Steel	White Br	White Br	Ball	2,450	36x3½	36x4½
MOON—C	3000	30–35	Toy Tonneau	4	4	4½	4½	H'comb	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	3	Shaft	4	Double Worm	112	56	Pressed Steel	White Br	White Br	Ball	2,500	36x3½	36x4½
MOON—C	3000	30–35	Touring	5	4	4½	4½	H'comb	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	3	Shaft	4	Double Worm	112	56	Pressed Steel	White Br	White Br	Ball	2,700	34x3½	34x4½
COATES-GOSHEN—32	3000	32	Touring	5	4	4½	5	Cellular	Gear	Bosch	Storage	Splash	Cone	Selective	3	Shaft	4	Double Screw	116	56½	Pressed Steel	Plain	H-B	Timken	2,650	36x4	36x4
LANE (Steamer)—18	3000	30	Close Coup'd	4	2							Splash		Chain	3		125	56	Steel	Roller			3,300	36x4	36x4
CARS COSTING BETWEEN $3,000 AND $4,000																											
LANE (Steamer)—17	$3100	30	Touring	7	2							Splash		Chain	3		119	56	Steel	Roller			3,400	36x4	36x4½
KISSEL KAR—D-9	3200	40	Limousine	5	4	4½	4½	Tubular	Gear	Remy	Dry	Mech	Cone	Selective	3	Shaft	4	Worm & Sector	115	56	Pressed Steel	White Metal	Timken	Timken		36x3½	36x4
KISSEL KAR—G-9	3250	60	Coupe	6	4½	4½	Tubular	Centrif'l	Bosch	Ory	Mech	Cone	Selective	3	Shaft	4	Worm & Sector	130	56	Pressed Steel	White Metal	Timken	Timken	3,100	36x4	36x4½
GEARLESS	3250	30–60	Optional	3–7	6	4½	5½	H'comb		Magneto	Storage		Cont. Ring	Gearless	2		3		124		Pressed Steel					36x4	36x4½
COATES-GOSHEN—25	3250	25	Landaulet	6	4	4	4	Cellular	Gear	Bosch	Storage	Splash	Cone	Selective	3	Shaft	4	Double Screw	113	56½	Pressed Steel	Plain	H-B	Timken	2,750	34x4	34x4
MORA—Light Six	3500	42–50	Racytype	3	6	4	5½	Tubular		Magneto	Storage		Cone	Selective	3	Shaft	4	Nut & Serew	105	56	Pressed Steel				2,250	36x3½	36x3½
GAETH—XX	3500	38	Close C'pled	5	4	4½	5½	H'comb	Thermo	Magneto	Storage		Cont. Band	Progres've	3	Shaft	4	Irreversible	114	56	Pressed Steel				2,900	36x4	36x4½
GAETH—XX	3500	38	Touring	4	4	4½	5½	H'comb	Thermo	Magneto	Storage		Cont. Band	Progres've	3	Shaft	4	Irreversible	114	56	Pressed Steel				2,500	36x4	36x4
GAETH—XX	3500	38	Touring	7	4	4½	5½	H'comb	Thermo	Magneto	Storage		Cont. Band	Progres've	3	Shaft	4	Irreversible	114	56	Pressed Steel				2,900	36x4	36x4½
MARMON—45	3500	45–50	Runabout	4	4	5	5	Cellular		H. T. Mag	Storage		Mul. Disc	Selective	3	Shaft	4	Screw & Nut	114	56½	Pressed Steel				3,250	34x4	34x4½
PREMIER—45	3500	45–55	Runabout	4	6	4½	4½	Cellular		Bosch	Storage		Mul. Disc	Selective	3	Shaft	4	Worm & Nut	124	56½	Pressed Steel				2,900	34x4	34x4½
PREMIER—45	3500	45–55	Touring	7	6	4½	4½	Cellular		Bosch	Storage		Mul. Disc	Selective	3	Shaft	4	Worm & Nut	124	56½	Pressed Steel				3,150	34x4	34x4½
PULLMAN—M	3500	40	Touring	7	4	5	5½	Tubular		Bosch	Dry		Cone	Selective	4	Shaft	4	Irreversible	119	56	Pressed Steel				3,000	36x4	36x4½
ACME—XXVI	3500	30	Touring	5	4	4⅛	5	Tubular		H. T. Mag	Storage		Cone	Progres've	3	Chains	3	Screw & Nut	102	56	Pressed Steel				3,100	34x4	34x4
ACME—XXVI	3500	30	Touring	5	4	4⅛	5	Tubular		H. T. Mag	Storage		Cone	Selective	3	Shaft	4	Screw & Nut	102	56	Pressed Steel				3,100	34x4	34x4
SPEEOWELL—M-E	3500	40	Limousine	7	4	4½	5	H'comb		Bosch	Ory		Cone	Selective	3	Shaft	4	Worm & Gear	120	56	Pressed Steel	P. White Br	Timken	Timken	3,200	34x4	34x5
MOON—O	3500	30–35	Touring	7	4	4½	4½	H'comb		Magneto	Storage		Mul. Oisc	Selective	4	Shaft	4	Double Worm	121	56	Pressed Steel	White Br	White Br	Ball	3,100	36x3½	36x4½
MORA	3600		Touring	5	6	4	5½	Tubular		Magneto	Storage		Cone	Selective	3	Shaft	4	Screw & Nut	115	56	Pressed Steel				2,500	36x4	36x4
ACME—XXVII	3700	35	Touring	7	4	5	5	Tubular		H. T. Mag	Storage		Cone	Selective	4	Chains	4	Serew & Nut	115½	56½	Pressed Steel				3,200	36x4	36x4½
NATIONAL—9-40	3700	40	Touring	7	4	5	5		Gear	Bosch	Storage		Cone	Selective	3	Shaft	4	Worm & Gear	125	56½	Pressed Steel				3,000	36x4½	36x4½
MARMON—50	3750	50–60	Close C'pled	4	4	5⅛	5	Cellular		H. T. Mag	Storage		Mul. Disc	Selective	3	Shaft	4	Screw & Nut	118	56½	Pressed Steel				3,400	36x4	36x5
MARMON—50	3750	50–60	Touring	7	4	5⅛	5	Cellular		H. T. Mag	Storage		Mul. Disc	Selective	3	Shaft	4	Screw & Nut	118	56½	Pressed Steel				3,500	36x4	36x5
MORA	3750	42–50	Roadster	4	6	4	5½	Tubular		Magneto	Storage		Cone	Selective	3	Shaft	4	Serew & Nut	115	56	Pressed Steel				2,400	36x4	36x4
AMERICAN	3750	50	Roadster	3	4	5½	5½		Centrif'l	H. T. Mag	Storage		Cone	Sliding	4	Shaft	4	Rack & Nut	110	56	Pressed Steel				2,750	36x3½	36x4
AMERICAN	3750	50	Toy Tonneau	5	4	5½	5½		Centrif'l	H. T. Mag	Storage		Cone	Sliding	4	Shaft	4	Rack & Nut	110	56	Pressed Steel				2,800	36x4	36x4½
AUSTIN—50	3750	50–60	Runabout	3	4	5½	5½	Tubular		Magneto	Storage		Disc	Selective	4	Shaft	4	Worm & Sector	124	54½	Pr. Al'y Steel				3,200	36x4	36x4
PENNSYLVANIA—E	3800	36.8	Touring	7	4	4½	5½	Mayo		Magneto			Cone	Selective	3	Shaft	4	Douhle Worm	122	56½	Pressed Steel				3,300	36x4	36x4½
AUSTIN—45	3850	45–50	Limousine	5	6	4½	4½	Tubular		Magneto	Storage		Disc	Selective	3	Shaft	4	Worm & Sector	122	54½	Alloy Steel				2,550	36x3½	36x4
MOON—D	3850	32	Town Car	5	4	4½	4½	H'comb	Centrif'l	Bosch		Forcefeed	Mult. Disc	Selective	4	Shaft	4		121	56	Pressed Steel	P. White Br	P. White Br	Ball		36x3½	36x4½
AMERICAN—Traveler	4000	50	Runabout	4	4	5½	5½		Centrif'l	H. T. Mag	Storage		Cone	Sliding	4	Shaft	4	Pinion & Nut	122	56	Pressed Steel				2,800	40x4	40x4
AMERICAN—Tourist	4000	50	Touring	7	4	5½	5½		Centrif'l	H. T. Mag	Storage		Cone	Sliding	4	Shaft	4	Rack & Nut	124	56	Pressed Steel				3,000	36x4	36x5
AUSTIN—50	4000	50–60	Touring	7	4	5½	5½	Tubular		Magneto	Storage		Disc	Selective	4	Shaft	4	Worm & Sector	124	54½	Alloy Steel				3,500	36x4½	36x4½
AM. SIMP'X (2 Cycle)—D	4000	50	Runabout	2	4	5	5	Tubular	Centrif'l	H. T. Mag	Storage		Mul. Disc	Selective	3	Shaft	4	Serew	110	56	Pressed Steel				3,000	36x4	36x4½
AM. SIMP'X (2 Cycle)—D	4000	50	Touring	5 or 7	4	5	5	Tubular	Centrif'l	H. T. Mag	Storage		Mul. Disc	Selective	3	Shaft	4	Serew	117	56	Pressed Steel				3,300	36x4	36x5
CARS COSTING BETWEEN $4,000 AND $5,000																											
NATIONAL—9-50	$4200	50	Touring	7	6	4½	4½		Centrif'l	Bosch	Storage		Cone	Selective	3	Shaft	4	Worm & Gear	130	56½	Pressed Steel				3,100	36x4½	36x4½
MOON—D	4250	32	Brevette	5	4	4½	4½	H'comb	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	4	Shaft	4		121	56	Pressed Steel					36x3½	30x4½
GAETH—XX	4500	38	Limousine	7	4	4½	5½	H'comb	Thermo	Magneto	Storage		Cont. Band	Progres've	3	Shaft	4	Irreversible	114	56	Pressed Steel				3,300	36x4	36x4½
ACME—XXI	4500	48	Runabout	4	6	4⅛	5	Tubular		H. T. Mag	Storage		Cone	Selective	4	Chains	4	Screw & Nut	115½	56½	Pressed Steel				3,100	36x4	36x4½
ACME—XX	4500	48	Touring		6	4⅛	5	Tubular		H. T. Mag	Storage		Cone	Selective	4	Chains	4	Screw & Nut	126	56½	Pressed Steel				3,300	36x4	36x4½
WELCH—4-M	4500	50	Runabout	5	4	4½	5	H'comb		Bosch	Storage		Mul. Disc	Selective	3	Shaft	4	Worm & Sector	120	56	Pr. Al'y Steel				3,300	36x4½	36x4½
WELCH—4-O	4500	50	Close C'pled	6	4	4½	5	H'comb		Bosch	Storage		Mul. Disc	Selective	3	Shaft	4	Worm & Sector	125	56	Alloy Steel				3,200	36x4½	36x4½
WELCH—4-L	4500	50	Touring	7	4	4½	5	H'comb		Bosch	Storage		Mul. Disc	Selective	3	Shaft	4	Worm & Sector	125	56	Alloy Steel				3,450	36x4½	36x4½
AUSTIN	4750	60–90	Roadster	3	6	5⅛	5½	Tubular		Magneto	Storage		Disc	Selective	4	Shaft	4	Worm & Sector	134	54½	Alloy Steel				3,500	36x4	36x4

MAKE AND MODEL	Price	H.P.	BODY Type	BODY Seats	MOTOR Cylinders	MOTOR Bore	MOTOR Stroke	COOLING Radiator	COOLING Pump	IGNITION Magneto	IGNITION Battery	Lubrication	Clutch	TRANSMISSION Type	TRANSMISSION Speeds	TRANSMISSION Drive	CONTROL Brakes	CONTROL Steering	WHEEL Base	WHEEL Track	Frame	BEARINGS Motor	BEARINGS Transmission	BEARINGS Axle	Weight	TIRES Front	TIRES Rear
CARS COSTING BETWEEN $4,000 AND $5,000—Continued																											
DeLUXE	$5000	50-60	Optional	5 or 7	4	5	5½	Tubular		Eisemann	Storage		Cone	Selective	4	Shaft	4	Worm & Sector	121	56	Alloy Steel				3,500	36x5	36x5
NATIONAL—9-60	5000	60	Touring	7	6	5	5		Gear	Bosch	Storage		Cone	Selective	3	Shaft	4	Worm & Gear	137	56½	Pressed Steel				3,850	36x5	36x5
AMERICAN	5000	50	Limousine		4	5½	5½		Centrif'l.	H. T. Mag	Storage		Cone	Selective	4	Shaft	4	Rack & Nut	124	56	Pressed Steel				3,600	36x4	36x5
AUSTIN	5000	50-60	Limousine	7	4	5½	5½	Tubular		Magneto	Storage		Mul. Disc	Selective	4	Shaft	4	Worm & Sector	124	54½	Alloy Steel				3,700	36x4½	36x4½
AUSTIN	5000	60-90	Touring	7	6	5½	5½	Tubular		Magneto	Storage		Disc	Selective	4	Shaft	4	Worm & Sector	134	54½	Alloy Steel				3,800	36x4½	36x4½
AM. SIMPLEX (2 Cycle)—D	5000	50	Limousine	7	4	5	5	Tubular	Centrif'l.	H. T. Mag	Storage		Mul. Disc	Selective	3	Shaft	4	Screw	117	56	Pressed Steel				4,000	36x4	36x5
CARS COSTING ABOVE $5,000																											
WELCH	$5500	50	Optional	7	4	4½	5	H'comb.		Bosch	Storage		Mul. Disc	Selective	3	Shaft	4	Worm & Sector	125	56	Alloy Steel				3,800	36x4½	36x4½
WELCH	5500	50	Limousine	7	4	4½	5	H'comb.		Bosch	Storage		Mul. Disc	Selective	3	Shaft	4	Worm & Sector	125	56	Alloy Steel				3,800	36x4½	36x4½
CHADWICK	5500	60	Touring	Opt'l. 6	5	6	6	H'comb.		Bosch	Dry		Expand'g.	Semi-Sel	4	Chains	3	Worm & Sector	130	56	Pressed Steel				3,300	36x4	36x5
AUSTIN	6000	60-90	Limousine	7	6	5½	5½	Tubular		Magneto	Storage		Disc	Selective	4	Shaft	4	Worm & Sector	134	54½	Alloy Steel				4,000	36x4½	36x4½
WELCH	6000	75	Optional	6	4½	5	H'comb.			Bosch	Storage		Mul. Disc	Selective	3	Shaft	4	Worm & Sector	138	56	Alloy Steel				4,000	36x5	36x5
ACME—XXV	6000	75	Touring	7	6	4½	5	H'comb.		Bosch	Storage		Mul. Disc	Selective	3	Shaft	4	Worm & Sector	133	56	Alloy Steel				3,450	36x4½	36x4½
DeLUXE—C	6250	50-60	Limousine	7	4	5	5½	Tubular		Eisemann	Storage		Cone	Selective	4	Chains	4	Screw & Nut	126	56½	Pressed Steel				3,500	36x4½	36x4½
CHADWICK	6500	60	Runabout	2	6	5	6	H'comb.		Bosch	Dry		Expand'g.	Semi-Sel	4	Chains	3	Worm & Sector	121	56	Alloy Steel				3,900	36x5	36x5
WELCH	7000	75	Optional	6	4½	5	H'comb.			Bosch	Storage		Mul. Disc	Selective	3	Shaft	4	Worm & Sector	138	56	Pressed Steel				3,000	36x4	36x4½
																									4,400	36x5	36x5

HIGH-WHEEL TYPES

BLACK—12	$450	14	Stanhope	2	2	4½	3½	Air		Air			Dry	Mech		Planetary	2	Chain	2	Wheel	69	56	Steel	White Metal	Mang. Br	Plain	890	38	38
KIBLINGER—H	450	13.5	Runabout	2	2	4½	3½	Air		Air			Dry	Splash	Disc	Planetary	2	Chains	2	Wheel	69	56	Angle				1,100	34x1½	34x1½
KIBLINGER—K	475	13.5	Runabout	2	2	4½	3½	Air		Air			Dry	Splash	Disc	Planetary	2	Chains	2	Wheel	69	56	Angle					34x1½	34x1½
KIBLINGER—L	500	13.5	Runabout	3	2	4½	3½	Air		Air			Dry	Splash	Disc	Planetary	2	Chains	2	Wheel	69	56	Angle					34x1½	34x1½
KIBLINGER—N	550	16	Runabout	3	2	4½	4½	Air		Air			Dry	Splash	Disc	Planetary	2	Chains	2	Wheel	78½	56	Angle					34x1½	34x1½
HOLSMAN—4	550	12.8	Runabout	2	2	4	4	Air		Air			Storage	Mech		Friction	2	Cables	2	Lever	65	56	Steel Tube					34x1½	34x1½
ANDERSON—B	550	12	Runabout	2	2	4	4½	Air		Air			Dry	Forcefeed		Planetary	3	Chains	2	Worm	70	56				Roller	850	1½	1½
BLACK—115	575	20	Roadster	3	2	4½	4½	Air		Air			Dry	Mech		Planetary	2	Chain	2	Wheel	83	56	Steel	White Metal	Mang. Br	Plain	1,020	36	36
KIBLINGER—NN	600	16	Roadster	3	2	4½	4½	Air		Air			Dry		Disc	Planetary	2	Chains	2	Wheel	89	56	Angle					34x1½	34x1½
KIBLINGER—GG	600	16	Surrey	4	2	4½	4½	Air		Air			Dry		Disc	Planetary	2	Chains	2	Wheel	78	56	Angle					34x1½	34x1½
BLACK—118	650	20	Surrey	4	2	4½	4½	Air		Air			Dry	Mech	Disc	Planetary	2	Chain	2	Wheel	78	56	Steel	White Metal	Mang. Br	Plain	1,250	38	38
HOLSMAN—5	650	12.8		2	2	4	4	Air		Air			Storage				2	Cables	2	Lever	65	56	Steel Tube				845	1½	1½
KIBLINGER—P	675	16		6	2	4½	4½	Air		Air			Dry		Disc	Planetary	2	Chains	2	Wheel	100	56	Angle					34x1½	34x1½
SCHACHT—K	680	18-20	Corning	2	2	4½	4½	Tubular		Gear			Dry	Mech		Friction	5	Chain	2	Worm & Sector	74	56		White Br		Timken	1,100	1½	1½
HOLSMAN—9	700	12.8		2	2	4	4	Air		Air			Storage				2	Cables	2	Lever	75	56	Steel Tube				930	1½	1½
HOLSMAN—10	750	12.8	Stanhope	2	2	4	4	Air		Air			Storage				2	Cables	2	Lever	75	56	Steel Tube				940	1½	1½
KIBLINGER—M	750	27		3	4	4½	3½	Air		Air			Dry		Disc	Planetary	2	Chains	2	Wheel	100	56	Angle					34x1½	34x1½
HOLSMAN—11	800	12.8	Surrey	4	2	4	4	Air		Air			Storage				2	Cables	2	Lever	75	56	Steel Tube				1,055	1½	1½
HOLSMAN—H-15	1000	26	Coupe	2	4			Air		Air			Storage				2	Chains	2	Lever	75	56	Arm'd Wood				1,100	1½	1½
BLACK—40	1250	40	Touring	5	4	4½	4½	Air		Air	Magneto		Dry	Mech	Warner	Sliding	3	Shaft	4	Wheel	112	56	Steel	Man. Br	Roller	Roller	1,750	38x	38x

COMMERCIAL CARS

COSTING $1,000 OR LESS

KIBLINGER—R	$475	13-16	Mail Wagon	2	2	4½	4½	Air		Air			Dry		Disc	Planetary	2	Chains	2	Wheel	69	56	Angle					1½	1½
BRUSH	660	7	Delivery	1	4	4	4	H'comb.		Thermo.			Dry		Mul. Disc	Planetary	2	Chains	2	Wheel	74	56	Wood				950	32x2	32x2
HOLSMAN—12	700	12 8	Delivery	2	4	4		Air		Air			Storage				2	Cable	2	Lever	75	56	Steel Tube				1,060	1½	1½
KIBLINGER—150	825	16	Delivery	2	2	4½	4½	Air		Air			Dry		Mul. Disc	Planetary	2	Chains	2	Wheel	77	...	Angle					34x1½	34x1½
FORD—T	950	20	Taxicab	4	4	3½	4			Centrif'l.	Magneto				Mul. Disc	Planetary	2	Shaft	3	Irreversible	100	56	Pressed Steel				1,350	30x3	30x3½

COMMERCIAL CARS—Continued. CARS COSTING BETWEEN $1,000 AND $2,000

MAKE AND MODEL	Price	H.P.	BODY Type	BODY Seats	MOTOR Cylinders	MOTOR Bore	MOTOR Stroke	COOLING Radiator	COOLING Pump	IGNITION Magneto	IGNITION Battery	Lubrication	Clutch	TRANSMISSION Type	TRANSMISSION Speeds	TRANSMISSION Drive	CONTROL Brakes	CONTROL Steering	WHEEL Base	WHEEL Tread	Frame	BEARINGS Motor	BEARINGS Transmission	BEARINGS Axle	Weight	TIRES Front	TIRES Rear
HART-KRAFT—A-0	$1050	14	Chassis	½-Ton	2	4½	4	.....	Thermo.	Splitdorf	Dry	.....	Mul. Disc.	Planetary	2	Chains.	2	Wheel	90	56	Arm'd Wood.	Bronze	Bronze	Roller	2,000	36x2	36x2
HART-KRAFT—A-1	1100	14	Delivery	½ Ton	2	4½	4	.....	Thermo.	Splitdorf	Dry	.....	Mul. Disc.	Planetary	2	Chains.	2	Wheel	90	56	Arm'd Wood.	Bronze	Bronze	Roller	.....	36x2	36x2
HART-KRAFT—A-2	1175	14	Delivery	½-Ton	2	4½	4	.....	Thermo.	Splitdorf	Dry	.....	Mul. Disc.	Planetary	2	Chains	2	Wheel	90	56	Arm'd Wood.	Bronze	Bronze	Roller	.....	.....	.....
HART-KRAFT—A-3	1200	14	Delivery	½ Ton	2	4½	4	.....	Thermo.	Splitdorf	Dry	.....	Mul. Disc.	Planetary	2	Chains	2	Wheel	90	56	Arm'd Wood.	Bronze	Bronze	Roller	.....	.....	.....
MAXWELL—O-D	1400	20	Delivery	2	2	5	5	H'comb.	Thermo.	Magneto	Storage	.....	Mul. Disc.	Sliding	3	Shaft	4	Pinion & Seg't.	90	56½	Pressed Steel	.....	.....	.....	1,700	30x3½	30x4
GRAMM-LOGAN—Y	1600	25	Delivery	2	4	4	4	Air	Air	Magneto	Dry	Forcefeed	Mul. Disc.	Sliding	2	Chains.	4	Angle	90	56½	Angle	Bronze	Timken	.....	.....	34x3	34x3
AMERICAN—T	1750	20	Delivery	½ Ton	4	4	4½	Cellular.	Centrif'l.	.....	Storage	Mech	Cone	Sliding	3	Chains.	2	Wheel	102	56½	Arm'd Wood.	Bronze	Roller	Timken	1,800	32x2½	32x2½
LANSDEN—359	1850	.....	2-Ton	.....	E	lec	tric	.....	.....	.....	.....	.....	.....	.....	3	Chains.	.....	.....	120	52	Wood Arm'd.	Plain	.....	.....	3,000	24x6	24x6

CARS COSTING BETWEEN $2,000 AND $3,000

DRAMM-LOGAN—V	$2250	25	1½ Tons	.....	4	4	4	Air	Air	Magneto	Dry	Porcefeed	Mul. Disc.	Sliding	3	Chains	4	.....	96	56½	Channel	Bronze	Timken	Timken	2,700	34x3½	34x3½
GRABOWSKY	2300	25–30	1 Ton	.....	2	5½	5	H'comb.	Thermo.	H. T. Mag	Storage	.....	Cone	Planetary	2	Chains.	3	.....	102	56	Pressed Steel	.....	.....	.....	2,900	3½	3½
LANSDEN—36	2450	.....	1-Ton Exp	.....	E	lec	tric	.....	.....	.....	.....	.....	.....	.....	3	Chains.	.....	.....	88	56	Wood Arm'd.	Plain	.....	.....	3,000	32x3½	32x3½
AMERICAN—S	2500	25	1 Ton	.....	4	4	4½	Cellular.	Centrif'l.	.....	Storage	Forcefeed	Cone	Sliding	3	Chains.	2	Wheel	108	56½	Arm'd Wood.	Bronze	Roller	Timken	2,500	32x3	32x3
PULLMAN	2500	20	Taxicab	4	4	3½	3½	Tubular.	.....	Magneto	.....	.....	Cone	Selective	3	Shaft	3	Irreversible	102	56	Pressed Steel	.....	.....	.....	2,200	30x4	30x4
ATLAS (Two Cycle)	2500	22	Taxicab	6	2	4½	4½	Cellular.	.....	.....	Dry	.....	Cont. Band	Sliding	3	Shaft	3	Irreversible	100	56	Pressed Steel	.....	.....	.....	2,500	30x4	30x4
SPEEDWELL	2500	24	Truck	.....	4	4	5	H'comb.	Gear	Bosch	Dry	Splash	Cone	Selective	3	Shaft	4	Worm & Gear	120	56	Pressed Steel	White Br.	Timken	Timken	3,030	34x5	34x5
GRABOWSKY—200-A	2600	25–30	Bns	12	2	5½	5	H'comb.	Thermo.	H. T. Mag.	Storage	.....	Cone	Planetary	2	Chains.	3	.....	102	56	Pressed Steel	.....	.....	.....	2,900	3½	3½
LANSDEN—36	2650	.....	1½-Ton	.....	E	lec	tric	.....	.....	.....	.....	.....	.....	.....	3	Chains.	.....	.....	88	56	Wood Arm'd.	Plain	.....	.....	3,000	32x3½	32x3½
AMERICAN—M	2750	35–40	1½-Ton	.....	4	4½	5½	Cellular.	Centrif'l.	.....	Storage	Forcefeed	Cone	Sliding	3	Chains.	2	Wheel	112	56½	Arm'd Wood.	Bronze	Roller	Timken	5,500	36x4	36x5
ROCKWELL	2750	20	Taxicab	5	4	3½	4½	.....	.....	Magneto	.....	Mech	Mul. Disc.	Selective	3	Shaft	4	Worm & Nut	106	53	Steel	Bronze	N. D. Ball	N. D. Ball	.....	32x4	32x4
GRABOWSKY—420-A	2800	25–30	.....	.....	2	5½	5	H'comb.	Thermo.	H. T. Mag.	Storage	.....	Cone	Planetary	2	Chains.	3	.....	102	56	Pressed Steel	.....	.....	.....	2,900	3½	3½
AMERICAN—E or M	3000	35–40	2-T'n or 16-P.	.....	4	4½	5½	Tubular.	Centrif'l.	.....	Storage	Porcefeed	Cone	Sliding	3	Chains.	2	Wheel	112	56½	Arm'd Wood.	Bronze	Roller	Timken	5,500	36x4	36x5
GRABOWSKY	3000	25–30	Fire or Police	.....	2	5½	5	H'comb.	Thermo.	H. T. Mag.	Storage	.....	Cone	Planetary	2	Chains.	3	.....	102	56	Pressed Steel	.....	.....	.....	2,900	3½	3½

CARS COSTING BETWEEN $3,000 AND $4,000

GRABOWSKY—505-A	$3050	25–30	2-Ton	.....	2	5½	5	H'comb.	Thermo.	H. T. Mag.	Storage	.....	Cone	Planetary	2	Chains.	3	.....	127	56	Pressed Steel	.....	.....	.....	3,400	4	4
GRABOWSKY—600-A	3100	25–30	Palace	12	2	5½	5	H'comb.	Thermo.	H. T. Mag.	Storage	.....	Cone	Planetary	2	Chains.	3	.....	102	56	Pressed Steel	.....	.....	.....	2,900	3½	3½
GRAMM-LOGAN—X	3500	45	3-Ton	.....	4	4½	5	.....	Centrif'l.	Magneto	Dry	Forcefeed	Mul. Disc.	Sliding	3	Chains	4	.....	120	60	Channel	Bronze	Timken	Timken	5,000	36x5	36x3½ Dual
LANSDEN—46	3600	.....	2-Ton	.....	E	lec	tric	.....	.....	.....	.....	.....	.....	.....	3	Chains.	.....	.....	112	66	Wood Arm'd.	Plain	.....	.....	4,000	32x4	32x4
MANHATTAN	3750	50	2-Ton	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	126	68	Channel	White Br.	H-B	Timken	7,000	36x4½	36x3 Dual
AMERICAN—L	3800	55	Truck	3 Ton	4	5	6	Tubular.	Centrif'l.	.....	Storage	Porcefeed	Cone	Planetary	2	Chains.	2	Wheel	118	62	Arm'd Wood.	Bronze	Roller	Timken	7,400	36x5	36x4 Dual
BUFFALO—D	3800	55	Stage	20	4	5	6	Tubular.	Centrif'l.	.....	Storage	Porcefeed	Cone	Planetary	2	Chains.	2	Wheel	118	62	Arm'd Wood.	Bronze	Roller	Timken	7,400	36x5	36x3½ Dual
MANHATTAN	4000	50	3-Ton Chassis	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Porcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	Opt.	68	Channel	White Br.	H-B	Timken	6,900	36x5	36x3½ Dual

CARS COSTING BETWEEN $4,000 AND $5,000

MANHATTAN	$4250	50	3-Ton Exp	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	126	68	Channel	Bronze	H-B	Timken	7,500	36x5	36x3½ Dual
MANHATTAN	4300	50	3-Ton Exp	.....	4	5½	6	H'comh.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	132	68	Channel	Bronze	H-B	Timken	7,500	36x5	36x3½ Dual
MANHATTAN	4350	50	3-Ton Groc'ry	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Conc	Selective	3	Chains.	4	Screw & Nut	126	68	Channel	Bronze	H-B	Timken	7,500	36x5	36x3½ Dual
MANHATTAN	4400	50	3-Ton Wool'n	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	142	68	Channel	Bronze	H-B	Timken	7,000	36x5	36x3 Dual
AMERICAN—O	4500	65	5-Ton	.....	4	5½	6	Tubular.	Centrif'l.	.....	Storage	Forcefeed	Cone	Planetary	2	Chains.	2	Wheel	130	62	Arm'd Wood.	Bronze	Roller	Timken	8,500	36x6	36x5 Dual
MANHATTAN	4650	50	4-Ton	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	127	72	Channel	Bronze	H-B	Timken	8,500	36x5	36x3½ Dual
MANHATTAN	4800	50	12-Pass	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	124	58	Channel	Bronze	H-B	Timken	5,600	36x4½	36x3 Dual
MANHATTAN	4800	50	5-Ton Chassis	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	Opt.	72	Channel	Bronze	H-B	Timken	7,500	36x6	36x4 Dual
MANHATTAN	5000	50	20-Pass	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	150	68	Channel	Bronze	H-B	Timken	6,800	36x4½	36x3 Dual
MANHATTAN	5000	50	16-Pass	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	122	58	Channel	Bronze	H-B	Timken	5,500	36x4½	36x3 Dual

CARS COSTING OVER $5,000

[illegible]	$6100	50	5-Ton	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	126	72	Channel	Bronze	H-B	Timken	8,800	36x6	36x4 Dual
[illegible]	5200	50	20-Pass	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	154	68	Channel	Bronze	H-B	Timken	7,000	36x5	36x3½ Dual
[illegible]	5500	50	16-Pass	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	132	68	Channel	Bronze	H-B	Timken	6,800	36x5	36x3½ Dual
[illegible]	6000	50	3-Ton Dump	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	132	72	Channel	Bronze	H-B	Timken	10,000	36x6	36x4 Dual
[illegible]	6000	50	22-Pass. Bus	.....	4	5½	6	H'comb.	Centrif'l.	Bosch	Dry	Forcefeed	Cone	Selective	3	Chains.	4	Screw & Nut	162	68	Channel	Bronze	H-B	Timken	8,500	36x6	36x4 Dual

COMMERCIAL CARS—Continued. CARS COSTING OVER $5,000

MAKE AND MODEL	Price	H.P.	BODY Type	BODY Seats	MOTOR Cylinders	MOTOR Bore	MOTOR Stroke	COOLING Radiator	COOLING Pump	IGNITION Magneto	IGNITION Battery	Lubrication	Clutch	TRANSMISSION Type	TRANSMISSION Speeds	TRANSMISSION Drive	CONTROL Brakes	CONTROL Steering	WHEEL Base	WHEEL Track	Frame	BEARINGS Motor	BEARINGS Transmission	BEARINGS Axle	Weight	TIRES Front	TIRES Rear
RAPID		24–30	1-Ton	2		5½	5	Tubular			Storage	Forcefeed	Mul. Disc	Planetary	2	Chains	2	Gear & Sector	90	56	Pressed Steel			Timken		3½	4
RAPID		24–30	1–1½-Ton	2		5½	5	Tubular			Storage	Forcefeed	Mul. Disc	Planetary	2	Chains	2	Gear & Sector	110	56	Pressed Steel			Timken		3½	4
RAPID		24–30	1½-Ton	2		5½	5	Tubular			Storage	Forcefeed	Mul. Disc	Planetary	2	Chains	2	Gear & Sector	111	56	Pressed Steel			Timken		3½	4
RAPID		24–30	16–20 Pass.	2		5½	5	Tubular			Storage	Forcefeed	Mul. Disc	Planetary	2	Chains	2	Gear & Sector	100	56	Pressed Steel			Timken		3½	4
RAPID		24–30	12–20 Pass.	2		5½	5	Tubular			Storage	Forcefeed	Mul. Disc	Planetary	2	Chains	2	Gear & Sector	111	56	Pressed Steel			Timken		3½	4
RAPID		24–30	Fire or P'lce	2		5½	5	Tubular			Storage	Forcefeed	Mul. Disc	Planetary	2	Chains	4	Worm & Sector	111	56	Pressed Steel			Timken		3½	4
RAPID		24–30	Ambulance	2		5½	5	Tubular			Storage	Forcefeed	Mul. Disc	Planetary	2	Chains	2	Gear & Sector	100	56	Pressed Steel			Timken		3½	4
RAPID		60	5-Ton	4		5½	6½	Tubular	Centrif'l	Magneto	Storage	Forcefeed	Mul. Disc	Selective	3	Chains	4	Worm & Sector	160	60	Pressed Steel		Timken	Timken	7,000	36x6	36x4 D'l
PITTSBURG (Elec.)—1		1000	Express	1	Motor									Sing. Red'n	4	Chain	2	Lever	75	56	Wood	Plain	Plain	Plain		32x2½	34x2½
PITTSBURG (Elec.)—2		1-Ton	Express	2	Motors									D. Red'n	4	Chains	2	Wheel	100	64	Wood	Plain	Plain	Plain		34x3½	34x3½
PITTSBURG (Elec.)—3		2-Ton	Express	2	Motors									D. Red'n	4	Chains	2	Wheel	108	64	Wood	Plain	Plain	Plain		34x4	34x4
CLEVELAND AUTOCAB			Taxicab	4		3½	4	H'comb.	Centrif'l	H. T. Mag		Splash	Mul. Disc	Selective	3	Shaft	3	Worm & Sector							2,600	32x4	32x4

FOREIGN CARS

RENAULT		8–10	Chassis	2	3	4¼		Tubular	Thermo.	Bosch		Pump	Cone	Progres've	3	Shaft	4	Worm Gear	77	50	Pressed Steel				1,100	700x85	700x85
RENAULT		9–12	Chassis	2	3½	4½		Tubular	Thermo.	Bosch		Pump	Cone	Progres've	3	Shaft	4	Worm Gear	99	52	Pressed Steel				1,350	810x90	810x90
RENAULT		10–14	Chassis	2	4	4½		Tubular	Thermo.	Bosch		Pump	Cone	Progres've	3	Shaft	4	Worm Gear	107	54	Pressed Steel				1,500	810x90	810x90
RENAULT		10–14	Chassis	4	3	4½		Tubular	Thermo.	Bosch		Pump	Cone	Progres've	3	Shaft	4	Worm Gear	107	54	Pressed Steel				1,600	810x90	810x90
RENAULT		12–16	Chassis	4	3½	4½		Tubular	Thermo.	Bosch		Pump	Cone	Progres've	4	Shaft	4	Worm Gear	107	55	Pressed Steel				1,800	810x90	810x90
RENAULT		14–20	Chassis	4	3¾	4½		Tubular	Thermo.	Bosch		Pump	Cone	Progres've	4	Shaft	4	Worm Gear	120	55	Pressed Steel				1,900	875x105	875x105
RENAULT		20–30	Chassis	4	4	5½		Tubular	Thermo.	Bosch		Pump	Cone	Progres've	4	Shaft	4	Worm Gear	120	55	Pressed Steel				2,500	915x120	920x120
RENAULT		35–45	Chassis	4	5½	5½		Tubular	Thermo.	Bosch		Pump	Cone	Progres've	4	Shaft	4	Worm Gear	132	55	Pressed Steel				2,800	915x120	920x120
RENAULT		50–60	Chassis	6	4½	5½		Tubular	Thermo.	Bosch		Pump	Cone	Progres've	4	Shaft	4	Worm Gear	138	56	Pressed Steel				3,200	935x135	935x135
LANCIA	$3000	12–18	Chassis	4	3	3½	3½	H'comb.	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	4	Shaft	3	Worm & Sector	110	54½	Pressed Steel	Plain	Ball	Ball	1,700	810x90	820x120
LANCIA	3300	12–18	Lampo	4	3	3½	3½	H'comb.	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	4	Shaft	3	Worm & Sector	105	54½	Pressed Steel	Plain	Ball	Ball		810x90	820x120
LANCIA	3300	12–18	Touring	4	3	3½	3½	H'comb.	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	4	Shaft	3	Worm & Sector	110	54½	Pressed Steel	Plain	Ball	Ball		810x90	820x120
LANCIA	3300		Chassis	6	3	3½	3½	H'comb.	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	4	Shaft	3	Worm & Sector	128	54½	Pressed Steel	Plain	Ball	Ball		810x90	820x120
LANCIA	4000	12–18	Town Car	4	3	3½	3½	H'comb.	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	4	Shaft	3	Worm & Sector	110	54½	Pressed Steel	Plain	Ball	Ball		810x90	820x120
ISOTTA	4250	14–20	Chassis	4	3	5¼	4 7/8	Tubular	Gear	Magneto		Pres.	Mul. Disc	Selective	4	Shaft	4	Worm & Sector	118.5	55		Bronze	D. & P.	D. & P.	1,880	875x105	875x105
ISOTTA	4500	18–24		4	4	5½	5 1/2	Tubular	Gear	Magneto		Pres.	Mul. Disc	Selective	3	Chains	3	Worm & Sector	118.1	55		Bronze	D. & P.	D. & P.	2,320	870x90	880x120
ISOTTA	4600	18–24		4	4	5½	5 1/2	Tubular	Gear	Magneto		Pres.	Mul. Disc	Selective	3	Chains	3	Worm & Sector	125.9	55		Bronze	D. & P.	D. & P.	2,420	870x90	880x120
ISOTTA	5250	15–25		6	3	5¼	4 7/8	Tubular	Gear	Magneto		Pres.	Mul. Disc	Selective	4	Shaft	4	Worm & Sector	124	55		Bronze	D. & P.	D. & P.	1,980	875x105	875x105
ISOTTA	5600	10–45		4	5	12	5 9/16	Tubular	Gear	Magneto		Pres.	Mul. Disc	Selective	3	Chains	3	Worm & Sector	124	55		Bronze	D. & P.	D. & P.	2,640	910x90	920x120
ISOTTA	8500	50–60		4	5	9½	6 3/8	Tubular	Gear	Magneto		Pres.	Mul. Disc	Selective	3	Chains	3	Worm & Sector	128	55		Bronze	D. & P.	D. & P.	2,760	875x105	935x135
ISOTTA	8500	50		4	5	7¼	4 7/8	Tubular	Gear	Magneto		Pres.	Mul. Disc	Selective	3	Chains	3	Worm & Sector	118	55		Bronze	D. & P.	D. & P.	2,600	870x90	880x120
C. G. V.	2500	8–10	Landaulet	6	2	3	2 4.8	Tubular	Thermo.	Bosch		Pump	Cone	Progres've	3	Shaft	3	Worm	108	54	Steel	Plain	Plain	Ball	1,250	810x90	32x3½
C. G. V.	3000	12–15	Runabout	3	4	3	2 4.8	Tubular	Thermo.	Bosch		Pump	Cone	Progres've	3	Shaft	3	Worm	108	54	Steel	Plain	Plain	Ball	1,250	810x90	32x3½
C. G. V.	3250	15–20	Chassis	4	4	3.8	5.2	Tubular		Bosch		Pump	Cone	Progres've	3	Shaft	3	Worm	108	56	Steel	Plain	Ball	Ball		815x105	34x4
C. G. V.	3300	12–15	Landaulet	6	4	4.2	4.8	Tubular	Thermo.	Bosch		Pump	Cone	Progres've	3	Shaft	3	Worm	108	54	Steel	Plain	Plain	Ball	1,250	810x90	32x3½
C. G. V.	4500	20–30	Chassis	4	4	4	5.2	Tubular		Bosch		Pump	Cone	Progres've	4	Chains	4	Worm	112	56	Steel	Plain	Ball	Ball	1,750	920x120	36x4½
C. G. V.	5000	30–40	Chassis	4	5	8	5.2	Tubular		Bosch		Pump	Cone	Progres've	4	Chains	4	Worm	112	56	Steel	Plain	Ball	Ball	1,850	920x120	36x4½
C. G. V.	6000	50–60	Chassis	4	6	6	6.4	Tubular		Bosch		Pump	Cone	Selective	4	Chains	4	Worm	112	56	Steel	Plain	Ball	Ball	2,100	920x120	36x4½
C. G. V.	7500	75–90	Chassis	4	3	4	6.4	Tubular		Bosch		Pump	Cone	Selective	4	Chains	4	Worm	112	56	Steel	Plain	Ball	Ball	2,300	920x120	36x4½
C. G. V.	10000	90–120	Chassis	4	7		6.4	Tubular		Bosch		Pump	Cone	Selective	4	Chains	4	Worm	112	56	Steel	Plain	Ball	Ball	1,950	920x120	36x4½
DeDIETRICH—VPH		14	Chassis	4	3	5	4 7			H. T. Mag		Pres.	Disc	Selective	4	Shaft	4	Worm & Sec't.	118		Pressed Steel		Ball	Ball		875x105	875x105
DeDIETRICH—Cef		20		4	4	3	5.1			L. T. Mag		Pres.	Disc	Selective	4	Shaft	4	Worm & Sec't.	123		Pressed Steel		Ball	Ball		870x90	920x120
DeDIETRICH—Cf		18		4	4	3	5.1			L. T. Mag		Pres.	Disc	Selective	4	Chains	4	Worm & Seg't.	120		Pressed Steel		Ball	Ball		870x90	920x120
DeDIETRICH—Tf		18		4	4	3	5.1			L. T. Mag		Pres.	Disc	Selective	4	Chains	4	Worm & Seg't.	129		Pressed Steel		Ball	Ball		875x105	935x135
DeDIETRICH—Cfm		28		4	4	4.7	5 5			L. T. Mag		Pres.	Disc	Selective	4	Chains	4	Worm & Seg't.	120		Pressed Steel		Ball	Ball		870x90	920x120
DeDIETRICH—Tfm		28		4	4	4.7	5 5			L. T. Mag		Pres.	Disc	Selective	4	Chains	4	Worm & Seg't.	130		Pressed Steel		Ball	Ball		875x105	935x135
DeDIETRICH—Cfo		40		4	5	5.1	5 9			L. T. Mag		Pres.	Disc	Selective	4	Chains	4	Worm & Seg't.	123		Pressed Steel		Ball	Ball		875x105	935x135
DeDIETRICH—Tfo		40		4	5	5.1	5 9			L. T. Mag		Pres.	Disc	Selective	4	Chains	4	Worm & Seg't.	133		Pressed Steel		Ball	Ball		875x105	935x135
DeDIETRICH—FER		60		4	5	6	7 1			L. T. Mag		Pres.	Disc	Selective	4	Chains	4	Worm & Seg't.	128		Pressed Steel		Ball	Ball		875x105	935x135
DeDIETRICH—Cfo-6		75		6	5	1	5 9			L. T. Mag		Pres.	Disc	Selective	4	Chains	4	Worm & Seg't.	138		Pressed Steel		Ball	Ball		875x105	935x135
DeDIETRICH—Tfo-6		75		6	5	1	5 9			L. T. Mag		Pres.	Disc	Selective	4	Chains	4	Worm & Seg't.	147		Pressed Steel		Ball	Ball		875x105	935x135
FIAT	2750	12	Chassis	4	3	15	3.94	H'comb.	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	3	Shaft	3		100	54	Steel	Plain	Ball	Ball	1,550	810x90	810x90
FIAT	3500	18		4	3	5¼	4.72	H'comb.	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	4	Shaft	3		120	56	Steel	Plain	Ball	Ball	1,900	810x90	820x120
FIAT	4500	25		4	4	4.33	5.12	H'comb.	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	4	Shaft	3		120	56	Steel	Plain	Ball	Ball	2,350	910x90	920x120
FIAT	5000	40		4	4	9	2.5.91	H'comb.	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	4	Chains	4		126	56	Steel	Plain	Ball	Ball	2,550	910x90	920x120
FIAT	5250	45		4	5	12	5.91	H'comb.	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	4	Shaft	3		127	56	Steel	Plain	Ball	Ball	2,500	910x90	920x120
FIAT	6000	45		6	4	3.33	5.12	H'comb.	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	4	Chains	4		118	56	Steel	Plain	Ball	Ball	2,650	920x120	920x120
FIAT	7250	60		4	5	5.5	12	H'comb.	Centrif'l	Bosch		Forcefeed	Mul. Disc	Selective	4	Chains	4		118	56	Steel	Plain	Ball	Ball	2,424	875x105	880x120
PANHARD	1850	8–11	Optional	2	3	15	4.72	Coil		Centrif'l		H. T. Mag		Forcefeed			3	Shaft	2	Worm & Sector	98	56	Pressed Steel	Plain	Ball	Ball	1,700		
PANHARD	3000	10–15	Optional	4	3	15	4.72	Coil		Centrif'l		H. T. Mag		Forcefeed	Mul. Disc	Progres've	4	Shaft	3	Worm & Sector	112	56	Pressed Steel	Plain	Ball	Ball	1,900	875x105	875x105
PANHARD	3500	15–20	Optional	4	3	5¼	4.72	Coil		Centrif'l		H. T. Mag		Forcefeed	Mul. Disc	Progres've	4	Shaft	3	Worm & Sector	115	56	Pressed Steel	Plain	Ball	Ball	2,100	875x105	875x105
PANHARD	3500	15–20	Optional	4	3	5¼	4.72	Coil		Centrif'l		H. T. Mag		Forcefeed	Mul. Disc	Progres've	4	Chains	3	Worm & Sector	115	56	Pressed Steel	Plain	Ball	Ball	2,200	875x105	875x105
PANHARD	4100	18–30	Optional	4	3	9	4 5.12	Coil		Centrif'l		H. T. Mag		Forcefeed	Mul. Disc	Progres've	4	Shaft	3	Worm & Sector	118	56	Pressed Steel	Plain	Ball	Ball	2,250	875x105	875x105
PANHARD	4500	25–35	Optional	4	4	33	5.51	Coil		Centrif'l		H. T. Mag		Forcefeed	Mul. Disc	Progres've	4	Chains	3	Worm & Sector	124	56	Arm'd Wood	Plain	Ball	Ball	2,500	920x120	920x120

DETAILS OF THE 1909 CARS

FOREIGN CARS—Continued

MAKE AND MODEL	Price	H.P.	BODY Type	BODY Seats	MOTOR Cylinders	MOTOR Bore	MOTOR Stroke	COOLING Radiator	COOLING Pump	IGNITION Magneto	IGNITION Battery	Lubrication	Clutch	TRANSMISSION Type	TRANSMISSION Speeds	TRANSMISSION Drive	CONTROL Brakes	CONTROL Steering	WHEEL Base	WHEEL Track	BEARINGS Frame	BEARINGS Motor	BEARINGS Transmission	BEARINGS Axle	Weight	TIRES Front	TIRES Rear
DAIMLER	$5000	30–40	Optional	6	4	3.54	4.72	Coil	Centrif'l	H. T. Mag		Forcefed	Mul. Disc	Selective	4	Chains	3	Worm & Sector	118	56	Pressed Steel	Plain	Ball	Ball	2,250	920x120	920x120
DAIMLER	5500	35–45	Optional	4	4	3.92	4.91	H'comb.	Centrif'l	H. T. Mag		Forcefed	Mul. Disc	Progress've	4	Chains	3	Worm & Sector	125	56	Arm'd Wood	Plain	Pall	Ball	2,600	920x120	920x120
DAIMLER	7500	50–60	Optional	4	5	3.71	6.50	H'comb.	Centrif'l	H. T. Mag		Forcefed	Mul. Disc	Progress've	4	Chains	3	Worm & Sector	127	56	Arm'd Wood	Plain	Ball	Ball	2,700	920x120	920x120
DAIMLER	8700	65–80	Optional	6	5	5.32	5.51	H'comb.	Centrif'l	H. T. Mag		Forcefed	Mul. Disc	Selective	4	Chains	3	Worm & Sector	126	56	Pressed Steel	Plain	Ball	Ball	2,600	920x120	920x120
HOTCHKISS—T	3500	16–20	Chassis	4	4	3.74	4.33	H'comb.	Centrif'l	Eisemann		Pressure	Cone	Selective	4	Shaft	3	Worm & Sector	114½	53	Pressed Steel	Plain	Ball	Ball	1,600	875x105	875x105
HOTCHKISS—X	4250	20–30	Chassis	4	4	4.33	5.12	H'comb.	Centrif'l	Eisemann		Pressure	Cone	Selective	4	Shaft	3	Worm & Sector	119	56	Pressed Steel	Plain	Ball	Ball	2,000	920x120	920x120
HOTCHKISS—U	4750	30–40	Chassis	4	4	4.72	5.51	H'comb.	Centrif'l	Eisemann		Pressure	Cone	Selective	4	Shaft	3	Worm & Sector	119½	56	Pressed Steel	Plain	Ball	Ball	2,200	920x120	920x120
HOTCHKISS—Y	6250	65	Chassis	6	6	4.72	5.51	H'comb.	Centrif'l	Eisemann		Pressure	Cone	Selective	4	Shaft	3	Worm & Sector	132	56	Pressed Steel	Plain	Ball	Ball	2,900	920x120	920x120
DELAUNAY-BELVILE	2800	10–15	Optional	4	4	3½	4½	H'comb.	Centrif'l	Bosch		Pump	Cone	Sliding	3	Shaft	3		118		Pressed Steel	Plain	Ball	Ball		810x90	810x90
DELAUNAY-BELVILE	3500	15–22	Optional	4	4	3½	4½	H'comb.	Centrif'l	Bosch		Pump	Cone	Sliding	4	Shaft	3		123		Pressed Steel	Plain	Ball	Ball		880x120	880x120
DELAUNAY-BELVILE	4000	15–25	Optional	6	4	3½	4½	H'comb.	Centrif'l	Bosch		Pump	Cone	Sliding	4	Shaft	3		125		Pressed Steel	Plain	Ball	Ball		880x120	880x120
DELAUNAY-BELVILE	4400	20–30	Optional	4	4	4½	5½	H'comb.	Centrif'l	Bosch		Pump	Cone	Sliding	4	Shaft	3		126		Pressed Steel	Plain	Ball	Ball		880x120	880x120
DELAUNAY-BELVILE	5000	28–35	Optional	4	4	4½	5½	H'comb.	Centrif'l	Bosch		Pump	Cone	Sliding	4	Chain	3		128		Pressed Steel	Plain	Ball	Ball		880x120	880x120
DELAUNAY-BELVILE	5100	25–40	Optional	6	4	4½	5½	H'comb.	Centrif'l	Bosch		Pump	Cone	Sliding	4	Shaft	3		130		Pressed Steel	Plain	Ball	Ball		880x120	880x120
DELAUNAY-BELVILE	6100	40–50	Optional	4	6	5½	5.5	H'comb.	Centrif'l	Bosch		Pump	Cone	Sliding	4	Chain	3		131		Pressed Steel	Plain	Ball	Ball		935x135	935x135
DELAUNAY-BELVILE	7000	40–55	Optional	6	4	4½	5½	H'comb.	Centrif'l	Bosch		Pump	Cone	Sliding	4	Chain	3		144		Pressed Steel	Plain	Ball	Ball		935x135	935x135
DELAUNAY-BELVILE	10000	60–75	Optional	6	6	5½	5.5	H'comb.	Centrif'l	Bosch		Pump	Cone	Sliding	4	Chain	3		147		Pressed Steel	Plain	Ball	Ball		990x135	990x135

T. B. JEFFERY EXHIBIT AT THE NEW YORK SALESROOMS, 38 WEST 62d STREET

RAMBLER—47	$1150	22	Optional	2	4	5	6	Tubular	Gear	Extra		Storage	Forcefed	Disc		Planetary	2	Chain	4	Nut & Screw	102	56	Pressed Steel	Wh. Metal	Roller	Roller		34x4	34x4
RAMBLER—41	1350	22	Optional	2	4	5	6	Tubular	Gear	Extra		Storage	Forcefed	Disc		Planetary	2	Chain	4	Nut & Screw	106	56	Pressed Steel	Wh. Metal	Roller	Roller		34x4	34x4
RAMBLER—44	2250	34	Optional	4	4	4½	5½	Tubular	Gear	Extra		Storage	Forcefed	Cone		Selective	3	Shaft	4	Nut & Screw	112	56	Pressed Steel	Wh. Metal	Roller	Roller	2,800	36x4	34x4
RAMBLER—45	2500	45	Touring	4	4	5	5½	Tubular	Gear	Extra		Storage	Forcefed	Cone		Selective	3	Shaft	4	Nut & Screw	123	56	Pressed Steel	Wh. Metal	Roller	Roller	3,200	36x4½	36x4½

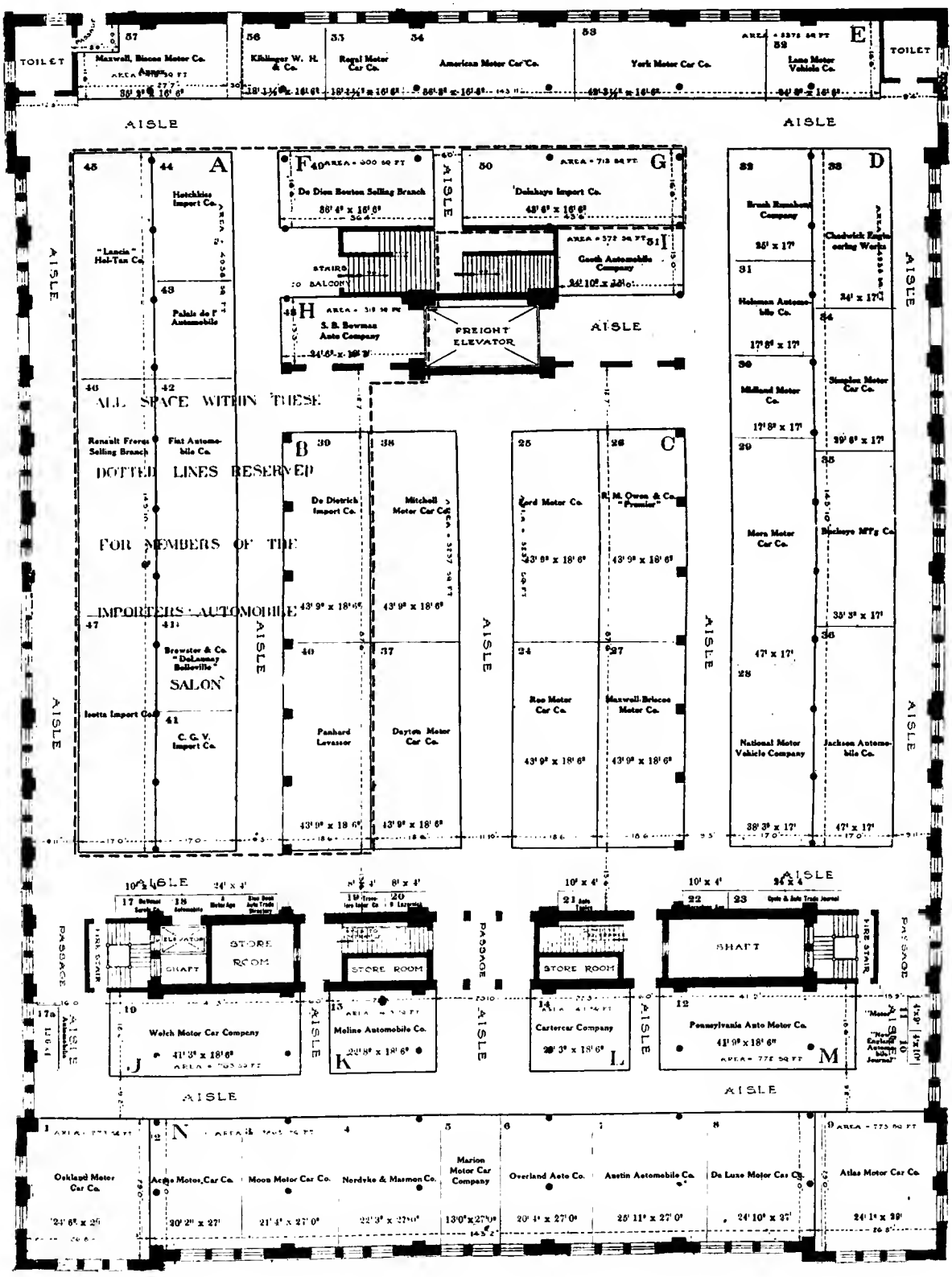
AMERICAN LOCOMOTIVE EXHIBIT AT WALDORF ASTORIA

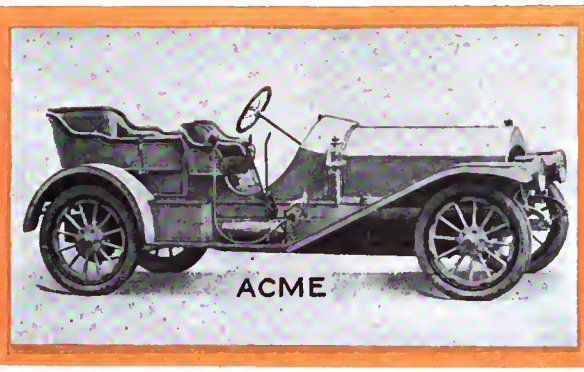
LOCOMOTIVE (Alco)	$4000	22	Touring	6	4	3.94	4.75	H'comb.		L. T. Mag				Selective	3	Shaft	4		112	55	Steel				3,400	34x3½	34x4½
LOCOMOTIVE (Alco)	4500	22	Limousine	6	4	3.94	4.75	H'comb.		L. T. Mag				Selective	3	Shaft	4		112	55	Steel				3,400	34x3½	34x4½
LOCOMOTIVE (Alco)	5000	40	Touring	7	4	4.75	5.5	H'comb.		L. T. Mag				Selective	4	Chains	4		126	55	Steel				3,520	36x4	36x4½
LOCOMOTIVE (Alco)	6000	60	Touring	7	6	4.75	5.5	H'comb.		H. T. Mag				Selective	4	Chains	4		134	55	Steel				3,750	36x4	36x4½

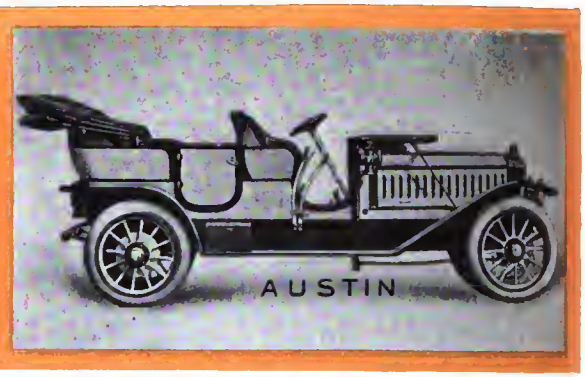
MOTOR AND ACCESSORY MANUFACTURERS.

(First Gallery)

Ajax-Grieb Rubber Company.
American Ball Bearing Company.
American Electrical Novelty Manufacturing Co.
Atwater-Kent Manufacturing Works.
Atwood-Castle Company.
Autocoil Company.
Auto Improvement Company.
Badger Brass Manufacturing Company.
Baldwin Chain & Manufacturing Company.
S. F. Bowser & Company.
Briscoe Manufacturing Company.
Brown Lipe Gear Company.
Byrne, Kingston & Company.
Coes Wrench Company.
Columbia Nut & Bolt Company.
Connecticut Telephone & Electric Company.
Consolidated Rubber Tire Company.
Continental Caoutchouc Company.
C. Cowles & Company.
Wm. Cramp & Sons Ship & Engine Building Co.
Diamond Chain & Manufacturing Company.
Diamond Rubber Company.
Joseph Dixon Crucible Company.
Dow Tire Company.
Edmunds & Jones Manufacturing Company.
Electric Storage Battery Company.
Empire Automobile Tire Company.
Firestone Tire & Rubber Company.
Fisk Rubber Company.
G & J Tire Company.
Gabriel Horn Manufacturing Company.
Gilbert Manufacturing Company.
Gemmer Manufacturing Company.
B. F. Goodrich Company.
Goodyear Tire & Rubber Company.
Gray & Davis.
Gray-Hawley Manufacturing Company.
C. T. Ham Manufacturing Company.
A. W. Harris Oil Company.
Hartford Rubber Works Company.
Hartford Suspension Company.
Heinze Electric Company.
Herz & Company.
Hess-Bright Manufacturing Company.
The Hoffecker Company.
Hyatt Roller Bearing Company.
Kokomo Electric Company.
Leather Tire Goods Company.
Light Manufacturing and Foundry Company.
McCord Manufacturing Company.
C. A. Metzger.
Michelin Tire Company.
Miller, Charles E.
Morgan & Wright.
A. R. Mosier & Company.
Motsinger Device Manufacturing Company.
Motz Clincher Tire & Rubber Company.
National Battery Company.
National Carbon Company.
National Coil Company.
Never-Miss Spark Plug Company.
N. Y. & N. J. Lubricant Company.
Oliver Manufacturing Company.
Pantasote Company.
Pennsylvania Rubber Company.
Pittsfield Spark Coil Company.
Randall-Faichney Company.
Remy Electric Company.
Republic Rubber Company.
J. H. Sager Company.
C. A. Shaler Company.
Shelby Steel Tube Company.
A. O. Smith Company.
Jones Speedometer Company.
Spicer Universal Joint Manufacturing Company.
C. F. Spiltdorf.
Sprague Umbrella Company.
Standard Roller Bearing Company.
Standard Welding Company.
Stewart & Clark Manufacturing Company.
Swinehart Clincher Tire & Rubber Company.
Timken Roller Bearing Axle Company.
Veeder Manufacturing Company.
Warner Gear Company.
Warner Instrument Company.
Weed Chain Tire Grip Company.
Westchester Appliance Company.
F. H. Wheeler.
Whitney Manufacturing Company.
Witherbee Igniter Company.

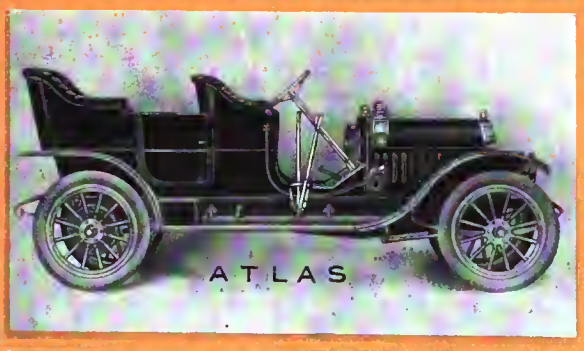






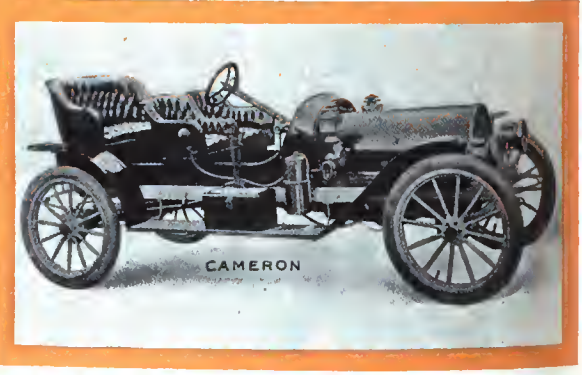
WORD PICTURES OF EXHIBITS.

A possible purchaser of an automobile might lose a whole day trying to locate the kind of a car he may want, and with the idea of aiding the selection, short word pictures of the cars to be seen may serve a far more useful purpose than to extol the beauties of the show as a whole and to generalize in relation to the advances in the industry, in relation to which every autoist is fully alive. The word picture will be supplemented by a short table, showing the types of cars made by the several companies, and, in some instances, illustrations will be given to help out. It would have been a good idea to illustrate at least two cars of each make, but this was out of the question, because photographs were not at hand and the makers did not have time to get them out. It will be understood, then, that cars illustrated were not so selected through any desire to give them undue prominence.

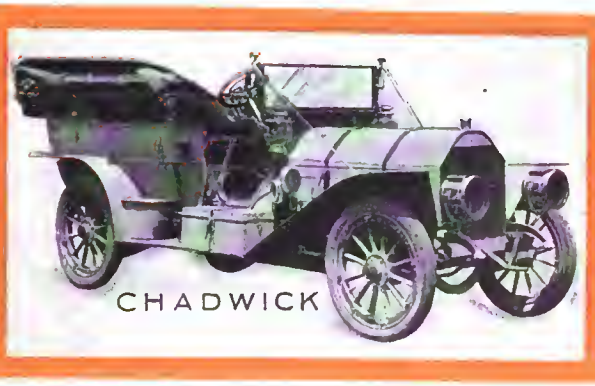


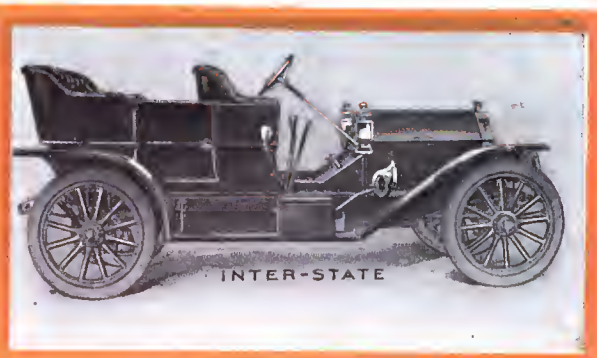
THE AMERICAN PLEASURE CARS.

American.—Beginning with the 50-horsepower American roadster, there is an attractive line of cars listed by the American Motor Car Company, Indianapolis, Ind., for the 1909 season. On the same chassis as the roadster are the American "Toy Tonneau" type, and the American "Wayfarer," all three of these cars listing at $3,750. Then there are the American "Tourist" and the American "Traveler," both being priced at $4,000, while above them is the limousine model listing at $5,000. Practically the same 50-horsepower chassis forms the foundation in the case of each, the only differences being such as are necessary to adapt it to the particular type of body, one of the chief points of distinction being the varying wheelbase, which ranges from 110 inches in the case of the roadster up to 124 inches in the case of the "Wayfarer," toy tonneau and limousine models. The motor dimensions are 5 1-4 by 5 1-2 inches, a cone clutch, four speed and reverse selective type of sliding gear and shaft drive constituting the transmission.



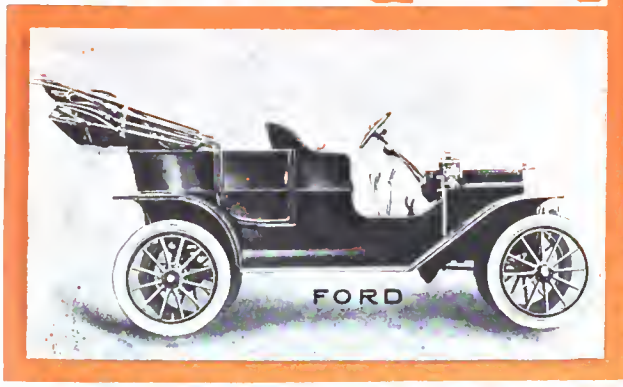
American Simplex.—This product comprises four models, each with a 50-horsepower motor of the four-cylinder type and transmission of the sliding gear genera, three speeds and reverse. The 50-horsepower motor is distinctive and the construction throughout is such as to attract the notice of buyers. The motor is two-cycle, for illustration, and the valveless condition, with water cooling and such other nice features as are recognized in this product, has rendered it possible for the makers to claim that they have made mile-a-minute records and established a reputation of a character that speaks well for the two-cycle





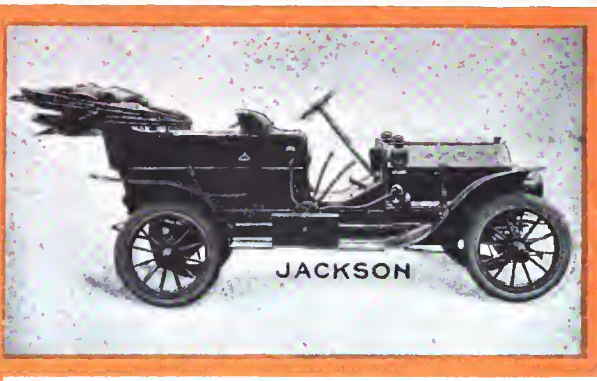
motor. The American Simplex is made at the works of the Simplex Motor Car Company, Mishawaka, Ind.

Acme.—The line of the Acme Motor Car Company, Reading, Pa., comprises some eight models, ranging in price from $2,500 to $6,000, and with bodies seating from two to seven. Three of the models are fitted with transmissions of three-speed and reverse and the remaining models are of the four-speed type of transmission. In this line of cars customers can choose between the four and six-cylinder motors; the first is of 30 horsepower or less, and the second choice is 48-horsepower or above. Reference to the general table will give the data of the Acme line.

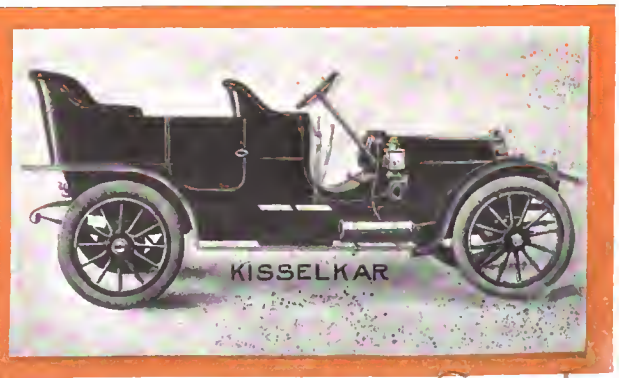


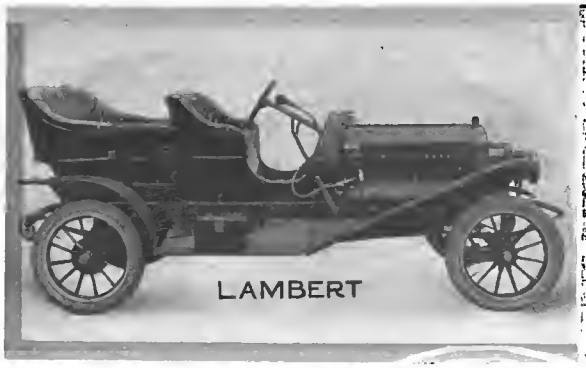
A-K.—The Allen-Kingston Motor Car Company, of New York City, offer to a discriminating public two models as follows: a 17-horsepower car with a four-cylinder motor for touring, and a 48-horsepower chassis with body work to suit. The 48-horsepower motor is with cylinders 5.12 by 6.18 inches, bore and stroke respectively. Attention is called to the use of the "New Departure" ball bearings in the cars, almost to the entire exclusion of plain bearings. The 17-horsepower model is of the type involving "en bloc" cylinder castings and the "left-hand" steering is something to take notice of. This model is especially designed for maneuvering in congested streets and can turn in an ordinary street. It is the desire of the company to call attention to the details of the line in point of finish, even down to hardening the nuts, which are finished in blue.

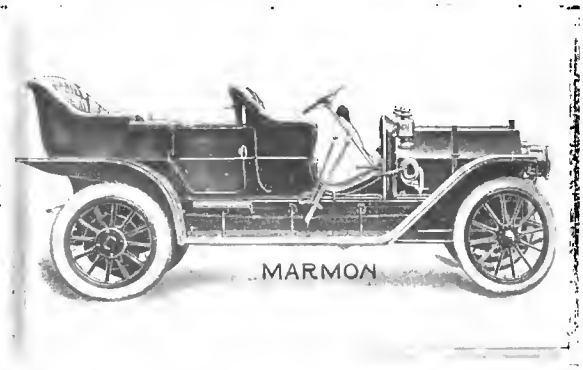
Atlas.—The Atlas Motor Car Company, Springfield, Mass., will be one of the very few concerns showing cars with two and three-cylinder motors, these, of course being of the two-cycle



type. Two chassis are shown in five different models. These are the 20-horsepower two-cylinder Atlas, which is listed as a runabout with rumble seat at $1,150, as a taxicab at $2,350, and as a town car at $2,500. Then there is the three-cylinder 30-horsepower Atlas, which is shown either as a runabout or as a touring type at $1,900 and $2,000 respectively. The cylinder dimensions in the case of each of these chassis are the same, namely 4 1-2 by 4 1-2 inches, the Atwater Kent spark generator being fitted for ignition, this apparatus having proved itself particularly well adapted to the two-cycle motor. The clutch is a contracting band type, while the small chassis is fitted with a two-speed sliding gear, and the 30-horsepower chassis with a three-speed selective type. The tire equipment of the 20-horsepower Atlas runabout is 32 by 3 1-2 inches, while with a closed body 30 by 4-inch tires are used, the equipment of the larger cars being 34 by 4-inch all round, quick detachable rims being fitted in every case.



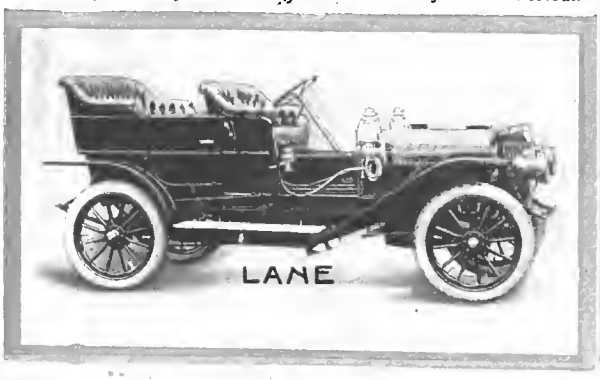


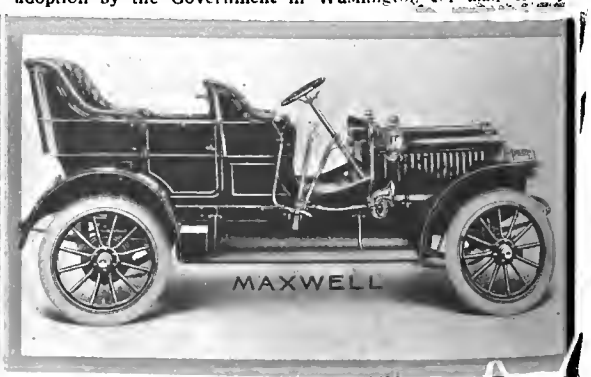


Austin.—This line comprises some nine models, ranging in price from $2,850 to $6,000, and the motors range in power from 45 to 90 horsepower, some of which are four-cylinders while the remainder of them are six-cylinders. The body work is of a high order and seats are from three, in the R-45 roadster, to seven in the T-60. The transmissions are with three and four speeds, depending upon the model, and a wide range of choices is afforded the company's patrons. The general table offered will give detailed data of the models in the Austin line, the product of the Austin Automobile Company, Grand Rapids, Mich.

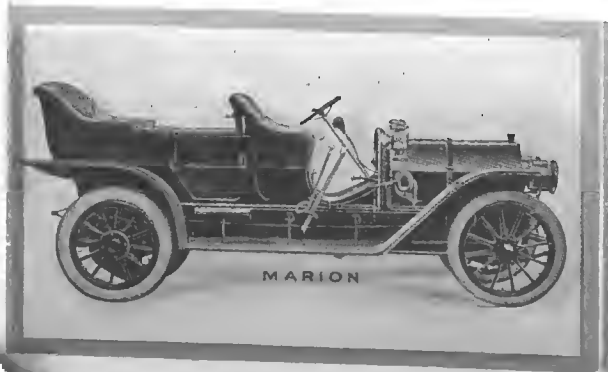
Alco.—Formerly the "Berliet" as made by the American Locomotive Company, Providence, R. I., would scarcely require any introduction at all were it not for a desire to remind the patrons of the company of the fact that in addition to the "four" a "six" is of the line, and a "taxicab" also numbers among the good. The "six" rated at 60 horsepower and the cylinder dimensions are 4 3-4 x 5 1-2 inches bore and stroke respectively. As respects the "four" it is to say, the cylinder dimensions are 4 3-4 by 5 1-2 inches bore and stroke respectively for the 40-horsepower model, while the taxicab demands the cylinder dimensions on a basis of 3 15-16 by 4 3-4 inches bore and stroke respectively. This company is holding to its usual policy of maintaining a separate exhibition, and they will entertain friends at the Waldorf-Astoria from January 2 to 23, where the cars can be seen.

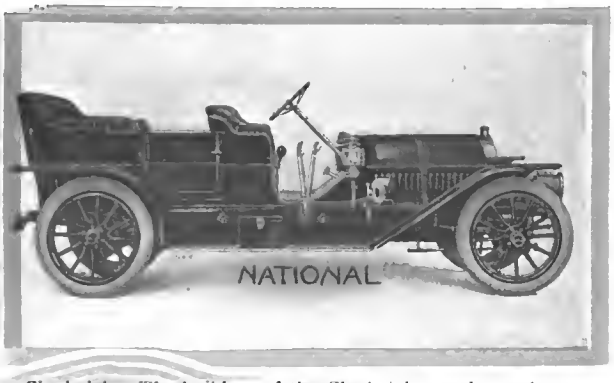
Brush.—Apart from a slight detail here and there, practically no changes have been made in the Brush runabout for 1909 as compared with its predecessor, and the latter proved so successful that the builders, the Brush Runabout Company, Detroit, Mich., are planning to turn out no less than 3,000 of these little $550 cars, besides 1,000 of the Brush delivery wagons mounted on the same chassis. The records established by the Brush runabout during the past year by demonstrating its ability to travel all over the country on a fast schedule and its adoption by the Government in Washington for mail delivery purposes give some idea of what the little car is capable of.





Cameron.—In these days when water-cooling is supreme and arrogant in its supremacy, it really is refreshing to come across an air-cooled motor now and then, particularly if this be a low-priced car of marked simplicity, intended for the man of moderate means and equally moderate mechanical ability. To such people the car made by the Cameron Motor Car Company, of Beverly, Mass., will appeal with a peculiar force. This little machine is now built in both four and six-cylinders, with runabout, roadster and touring car bodies. The transmission, although affording direct drive on all three forward speeds, is simplicity itself. This, located on the rear axle, is an exclu-

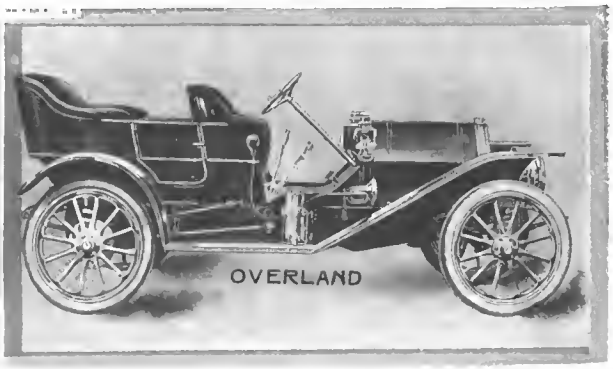




sive Cameron feature, this company holding patents which cover it thoroughly. These cars, owing to their extreme simplicity, are very light in weight, varying from 1,100 pounds in the four-cylinder runabout to 1,650 in the six-cylinder touring car. The prices of this product are within the reach of the masses, varing from $900 up to $1,500, the latter figure being asked for the six-cylinder models regardless of type of body.

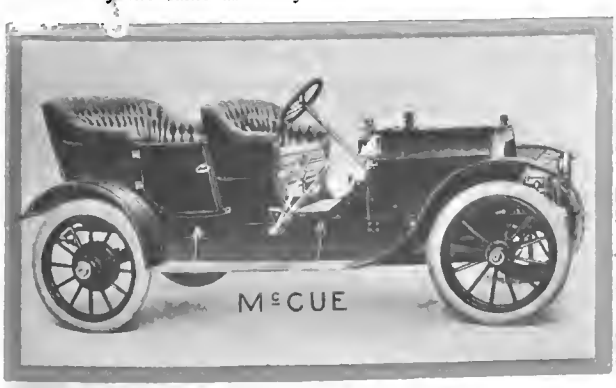
Cartercar.—During the time that the Cartercar has been on the market it has served to show in an unmistakable manner the capacity of the friction type of transmission for driving a car under the most severe conditions to be met with in automobiling, and doubtless the greater part of its success has been based upon its performances under adverse circumstances. For the coming season its builders, the Motorcar Company, Detroit, Mich., will exhibit an 18-20-horsepower chassis and a 22-24-horsepower chassis, both being equipped with the horizontal opposed type of two-cylinder water-cooled motor. So far as models are concerned, three will be listed, starting with model H runabout, listing at $1,000, this car having the smaller motor; then there will be a racy type Cartercar, with the 24-horsepower motor, listing at $1,350, while model K touring car, seating five passengers, will also list at the same price. With the exception of minor improvements here and there, the chassis design is substantially the same as last year.

Chadwick.—The builders of the Chadwick cars have always been consistent advocates of the high-powered machoine, and its line for the coming season shows nothing smaller than the 60-horsepower six-cylinder chassis, which made such an excellent showing in the leading contests of the year, while it carried off top-line honors at practically every hill-climb of importance in which it was entered. The efforts of both the designer and factory have always been concentrated on the production of a single type of chassis, which has accordingly been brought to a high state of perfection. The Chadwick is probably the only car ever built that has the distinction of being regularly fitted with two high-tension magnetos as a standard part of its equipment.



It embodies numerous other distinctive features such as the cop-water jacket encircling each one of the twin-cylinder castings, thus making the cooling of each pair of cylinders very uniform and at the same time independent of the others. Three types of bodies are listed, seating two, five and seven passengers. The Chadwick Engineering Company, Pottstown, Pa., are the builders.

Coates-Goshen.—With two chassis and four models, the Coates-Goshen Automobile Company, Goshen, N. Y., has entered the show prepared to hold its own in view of the modern work put upon the cars this company has to offer to its patrons. The model "25" has a four-cylinder motor, 4 by 4 inches bore and stroke respectively. It is water-cooled, has a cellular radiator,



and the ignition includes a "Bosch" magneto. The selective transmission has three speeds forward and reverse, and the wheelbase is 112 inches, with a 56 1-2-inch tread. Referring to model "32," it is noted that the bore and stroke respectively of the motor are 4 1-2 by 5 inches, and in general all the good features to be found on the model "25" are included. The transmission is with three speeds, as well as reverse, with a wheelbase of 116 inches and 56 1-2-inch tread. For more complete data of the cars, look for same in the general table of the cars.

De Luxe.—The De Luxe Motor Car Company, Detroit, Mich., will make but one chassis for the 1909 season and will list this in three models, namely, the model C touring car, model D tourabout and model C limousine, the first two listing at $5,000 while the last named is $6,250. The motor dimensions are 5-inch bore by 5 1-4-inch stroke and it is rated at 50-60-horsepower, its chief distinguishing feature being the use of oppositely disposed valves placed in the cylinder heads at an angle and operated by a single rocker arm from the same camshaft. High tension ignition is used, a magneto and storage battery being supplied as sources of current for the dual ignition system. The gear set is a selective type, giving four speeds forward, final drive being by shaft. Two sets of brakes are fitted on the driving wheels. The wheelbase is 121 inches in the case of all three models and the tire equipment is 36 by 5 inches all round. Both the touring model and the limousine have a capacity for seven passengers, while the tourabout seats five.

Ford.—Quite in contrast with its concentration of effort on a single type last year, the Ford runabout, the Ford Motor Company, Detroit, Mich., will for the 1909 season list a larger line of models than it has ever built before. There will be no less than seven types of Fords to choose from, beginning with the touring car at $850, of which doubtless a very large proportion of the proposed output of 25,000 cars will consist, and ending with the four-passenger tourabout at $1,000. Between these there is a three-passenger inside-driven coupé, listing at $950, the Ford taxicab at the same price, a two-passenger runabout, three-passenger roadster, and a five-passenger town car, all of which, like the tourabout, are listed at $1,000. Naturally, all of these models will have as their foundation the 20-horsepower four-cylinder chassis, the chief feature of novelty of which is the new ignition system, consisting of an inductor type of magneto embodied in the flywheel, thus making it an integral part of the motor, so that it goes without saying that a magneto will form part of the standard 1909 equipment.

Gaeth.—The Gaeth car for 1908 was the outcome of a policy of consistent adherence to certain lines of design, along which Paul Gaeth has been building cars on a small scale for several years, so that it was to be expected that the Gaeth Automobile Company, Cleveland, O., would show a machine reflecting the same tendencies for the 1909 season. Attention will be confined to a single type of chassis for pleasure car use, while the same is true of the commercial end, the Gaeth delivery wagon being continued in substantially the same form. The pleasure car is known as Model XX and is rated at 38-horsepower, being equipped with a four-cylinder vertical motor of special design that has been developed by Mr. Gaeth, this referring particularly to the low-tension ignition system and the means provided for retarding and advancing the spark timing. A band clutch, three speed selective sliding gear and shaft drive complete the transmission. Four-seated roaster, and five and seven-passenger touring models are listed at $3,500, while the Gaeth limousine is priced at $4,500.

Gyroscope.—This is the product of the Blomstrom Manufacturing Company, Detroit, Mich., and as its name indicates it is entirely in a class by itself. The two-cylinder, horizontal opposed motor is placed parallel with the side members of the frame, being supported on two special transverse members located under the bonnet. By removing two bolts, the entire power-plant can be taken out complete. The flywheel is of unusually large diameter and runs in a horizontal plane beneath the cylinders, thus giving rise to the name. At right angles to the flywheel and so arranged as to contact with the under face of it is a friction wheel, sliding on a squared shaft, an extension of which constitutes the propeller shaft of the car, thus giving a straight line drive. By moving this friction wheel backward or forward across the center of the flywheel, an extensive range of gradually increasing or decreasing forward or reverse speeds is obtained. By means of a small friction clamp on the rim of the flywheel, the motor may always be started from the seat through the medium of the side lever. An interlocking device connected with the spark advance eliminates all danger of a back fire.

Certain to command attention is the effort of the Gyroscope Automobile Co., of New York City, in so far as its efforts at the show are to be noted, lies in the 16-horsepower "friction" drive model of that make, the same fitted with a roadster body at $750, or a touring body at $800, and other options at the behest of patrons. This model weighs 1,500 pounds, is a ball and roller bearing proposition, and has its range of distinctive features, among which it may be well to call attention to the thermo-syphon cooling, including a honeycomb radiator which takes care of the two-cylinder motor, the bore of cylinders being 4½ inches and the stroke is the same. The car is of the shaft drive, with channel section frame, and a 95-inch wheelbase with a standard tread accounts for the good road performance.

Inter-State.—With a 40-horsepower four-cylinder motor of a refined type, using a three-speed (and reverse) transmission among the features, the Inter-State Automobile Co., of Muncie, Ind., will court fortune at the show. Dwelling upon the one model, with nothing else to detract the attention of the designers, it has ended in a car such as can scarcely go through the show and fail to attract the notice of buyers of intimate knowledge of what a good automobile should be like.

Jackson.—As has been the case during the past year or two, the Jackson Automobile Company, Jackson, Mich., will devote its attention partly to the two-cylinder type and partly to the four, the complete line comprising seven different models, of which three will be equipped with the two-cylinder horizontal opposed type of motor, and the remainder with the four-cylinder vertical. Beginning at the bottom of the list there is the Model F runabout, a 16-18-horsepower machine, with a twin cylinder motor listing at $850; Model K consists of the same chassis with a regulation type of touring body, the selling price of the car thus equipped being the same; Model C is a five-passenger touring car of the same type, but its two-cylinder engine is larger, being rated at 20-24 horsepower. There will also be two four-cylinder machines turned out, the smaller being a 30-horsepower car listing at $1,600, while the larger is a 35-horsepower car selling at $2,000, each being shown in touring and roadster bodies.

Kisselkar.—There is no less than three models listed by the Kissel Motor Car Company, Hartford, Wis., for 1909. Two of them are new and one is an eye-opener in the shape of a 30-horsepower model, listing at $1,500. It is practically a replica of the higher-priced machine, the performances of which, both in contests and in the hands of numerous private owners, served to make the Kisselkar reputation the country over in the course of a single season. Probably its most distinctive feature, where the power plant is concerned, is the dual ignition system, consisting of an Atwater Kent timer and dry cells on one side, and a Remy high-tension magneto with single vibrator coil on the other, both sets operating with independent plugs. The other two models are the 40-horsepower four-cylinder type, which is a continuation of last year's model of the Kisselkar, with a number of improvements, prominent among which may be mentioned the adoption of 36-inch wheels, instead of 34, while the other is a 60-horsepower, six-cylinder car. All embody numerous features of design and construction that make them noteworthy productions at low figures.

Lambert.—Friction drive is the chief distinguishing feature of the Lambert cars, manufactured by the Buckeye Manufacturing Company, Anderson, Ind., although they embody numerous other

points of design and construction that have been worked out by their builders during the several years that this car has been on the market. For the 1909 season, they will be sbown in a greater range of sizes and prices tban ever before, beginning with the Model A-1, three-seated, 20-horsepower runabout, listing at $800, and ending with the Model B-2, 35-40 horsepower, seven-seated touring car, which is being placed on the market this year at $2,000. Between these two, there are three different models, a touring type on the 20-horsepower chassis, and four and five-passenger cars on the 28-horsepower chassis. With the cxception of the smallcst, whicb is equipped with a horizontal opposed type of engine, a four-cylinder vertical motor will constitute tbe Lambert power plant. The Lambert friction drive, giving a universal range of speeds, is employed on all the models in question.

Lane Steamer.—For 1909 there will be two of the Lane steam chassis listed, one rated at 20 horsepower and the other at 30 horsepower. On the former there will be shown a three seated roadster type priced at $1,800, and a five-passenger touring car, listing at $2,000; while on the larger chassis there will be a Lane roadster at $2,800, a close-coupled four-passenger car at $3,000, and a seven-passenger touring car at $3,100. The features that have always characterized Lane construction during the past nine years have been retained, the power plant consisting of the combination fire-tube and coil generator under the bonnet, at the forward end of which the condenser is carried, while the engine is a two-cylinder compound placed in a sloping position under the footboards and driving to the rear axle by means of a single chain. A simpling device is employed by means of which the high pressure steam may be employed in both cylinders when extra power is needed. The Lane Motor Vehicle Company, Poughkeepsie, N. Y., are the manufacturers, while the car is marketed by the Lane Sales Company, 2637 Broadway, New York.

Marion.—Numerous excellent features of design characterize the Marion motor and, needless to add, these will be continued in the 1909 models of this car, which is manufactured by the Marion Motor Car Company, Indianapolis, Ind. The cylinders are cast independently, and are of the T type, having the valves oppositely disposed in outboard ports; two camshafts are used, the valves being operated by the direct thrust method. The gear pump for circulating the water and the ignition timer are both located on the forward end of the motor in accessible locations. The carbureter is a Schebler with automatic piston throttle, while high tension ignition is employed, a six-volt sixty-ampere hour set of storage cells supplying the current, with a set of dry cells for emergency use, on the four-cylinder Marion, while a magneto will be specified on the six-cylinder car. The clutch is of the multiple disc type, while the change-speed gear is a selectively operated silding set.

Marmon.—For the coming season the Nordyke & Marmon Company, Indianapolis, Ind., will place on the market the most extensive range of models that they have ever attempted. They will build three distinctive chasiss, namely, the 32-40-horsepower, 40-45-horsepower and 50-60-horsepower types, all of which will be equipped with four-cylinder motors. It is hardly necessary to add that those characteristic features of design and construction that have always served to place the Marmon product in a class of its own will be perpetuated in each one of the new models for 1909. Probably the most striking of these is the Marmon flexible running gear, by means of which a double three-point suspension is obtained, the power-plant and drive being supported on one member and the body on another, thus making either free to move according to the nature of the road surface. This prevents the severe binding and twisting strains imparted to the frame and body from reaching the power-plant or any one of the links in the transmission. The Marmon separable head water-cooled cylinder casting is also a striking feature of the Marmon power-plant.

Maxwell.—The new Maxwell runahout at $500, which is practically a replica of its confrères of the same name on a smaller scale, is the only addition to the Maxwell line for 1909, but it will be turned out in quantities, tbe company planning to build no less than 5,000 of these small cars during the coming season. The three models listed last year will be continued in substantially the same form. These include the Maxwell Model L B, which is a 14-horsepower runabout with a two-cylinder horizontal opposed type of motor, multiple disc clutch, and shaft drive, a two-speed planetary change gear set being employed. One of the features of this car not hitherto included as a part of its standard equipment will be a high tension magneto for ignition. Next to this size comes the Maxwell HD, a 20-horsepower touring car listing at $1,450. It is also equipped with a horizontal opposed type of twin-cylinder motor and multiple disc clutch, but has a three-speed sliding type of gear-set. Model KA 25-30-horsepower, four-cylinder car, shown in both touring and runabout types, completes the Maxwell line.

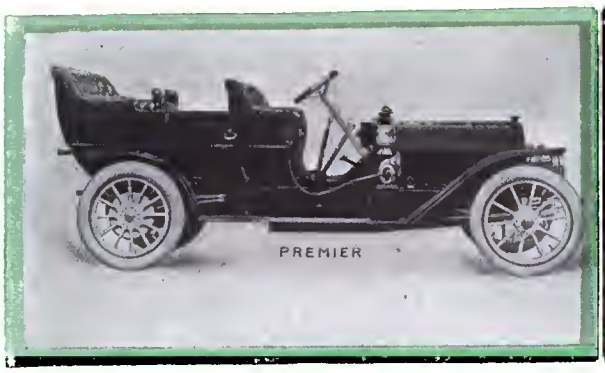
McCue.—This is the product of the McCue Company, of Hartford, Conn., and the patrons of the industry are justified in the interest they take in the McCue 30-horsepower model at the show. This car has a four-cylinder motor with double ignition—Bosch magneto and battery—selective type transmission, floating type rear axle, I-beam front axle, artillery wheels with 36 by 4-inch tires, and actually weighs 2,020 pounds. The wheelbase is 117 inches, track 56 inches. The engaging of this concern in automobile construction is considered significant, its previous energies having been greatly connected with the horse and carriage trade.

Middleby.—This product comprises two models from the point of view of immediate interest, as it centers around the show. Both the Model A and B bave a 25-horsepower motor, and the transmission is with three speeds, as well as a reverse to be sure. The motors are of the four-cylinder type, and the design, material, and workmanship is up to a high standard. Both models sell for $850. It is the Middleby Auto Co., of Reading, Pa., that turns out this line of cars.

Midland.—The Midland Motor Car Company, Moline, Ill., will list two models for the coming season, one a 25-30-horsepower car and the other a 35-horsepower machine. The former is known as Model E, and is equipped with a four-cylinder vertical motor, the dimensions of which are 4¼ by 5 inches, while the latter is termed Model G and has a 4½ by 5¼-inch motor. Model E has been designed to sell at $1,800, but it embodies many features of higher-priced machines, such as the three-speed selective change speed gear. It has a disc clutch, nut and screw type of steering gear, two sets of brakes on the rear wheels, and is equipped with 34 by 3½-inch tires all round. The wheelbase is 110 inches. Model G is a larger car listing at $2,250, and is shown in both touring and roadster types. Its motor dimensions are 4½ by 5¼ inches, developing its rating of 35 horsepower at a moderate speed. The remainder of its design is along practically the same lines as the smaller car, but proportionately larger, the wheelbase being 112 inches and the tire equipment 34 by 4 inches all round.

Moline.—For the 1909 season the Moline line, made by the Moline Automobile Company, East Moline, Ill., will be composed of two four-cylinder chassis, the smaller of which lists at $1,500 as a touring car, while the larger will be shown both as a runabout and touring car at $2,500. The power plant of the smaller car is rated at 24 horsepower, and embodies all those features of design and construction that have characterized the Moline cars during the past two or three years and that have done so much to contribute toward Moline success. This machine will be known as Model M. Model K is a 35-horsepower car, which is shown both as a three-seated roadster and as a five-passenger touring car, and while its specifications show it to be substantially a continuation of the Moline chassis of 1908, detailed improvements have been made in a number of instances, while both so far as its accessories and the materials and workmanship employed in its construction are concerned, it represents a much higher value at the price than before.

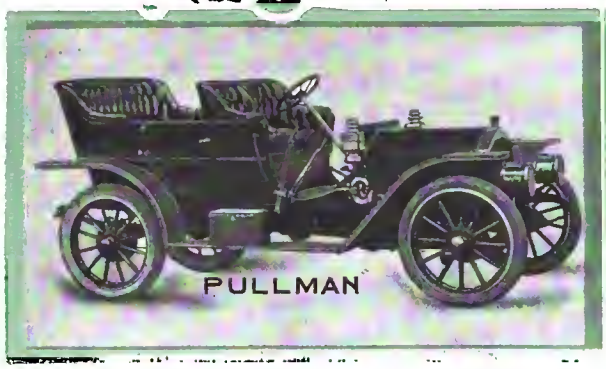
Mitchell.—The Mitchell Motor Car Company, Racine, Wis..

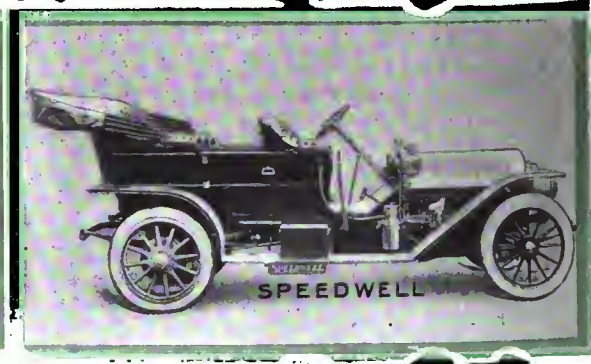


will devote its entire energies to the production of three models during the 1909 season, beginning with a four-cylinder 4 by 4 inch, rated at 20 horsepower, listing at $1,000 as a two-seater and known as Model J, and ending with the 35-40-horsepower Model L Mitchell, listing at $2,000. Intermediate these two, there is Model [illegible], which is a 28-30-horsepower car designed to sell at $1,500. It is fitted with a five-seated body of the touring type, but having a detachable tonneau so that it may readily be converted into a runabout. Its motor dimensions are 4¼ by 4½ inches; ignition is of the high tension type employing a magneto with dry cells for emergency use and a cellular radiator is fitted. The clutch is a cone type driving through a three-speed selective gear by shaft to the live rear axle. The wheelbase is 105 inches and the tire equipment 32 by 4 inches all round. Model L Mitchell has the same features of construction, but is on a larger scale, the wheelbase being 122 inches, while the tire equipment measures 34 by 4 inches, the car being a seven-passenger touring type.

known as Model D, will [illegible]. As a roadster, with a toy tonneau or [illegible] regulation touring type of body, it will be known as Model C and will list at $[illegible]. Some of the distinctive features of design of the [illegible] overhead camshaft with oppositely disposed valves in the cylinder heads, an arched type of rear axle permitting the driving wheels to be set slightly off the vertical plane, something that has only been possible hitherto with the side chain drive type of car. Annular ball-bearings are used throughout the [illegible] rear axle driving unit, a triangular form of torsion rod being employed to relieve the latter of stresses.

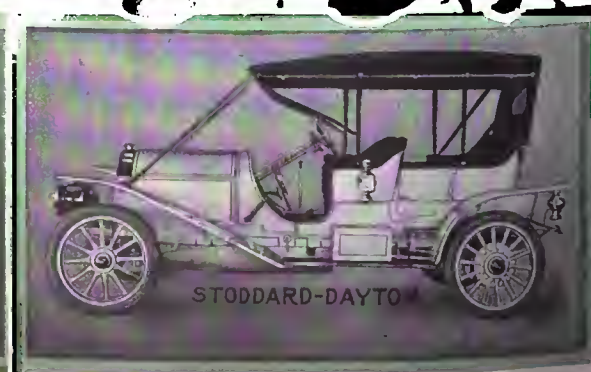
Mora.—With a view to [illegible] the great-

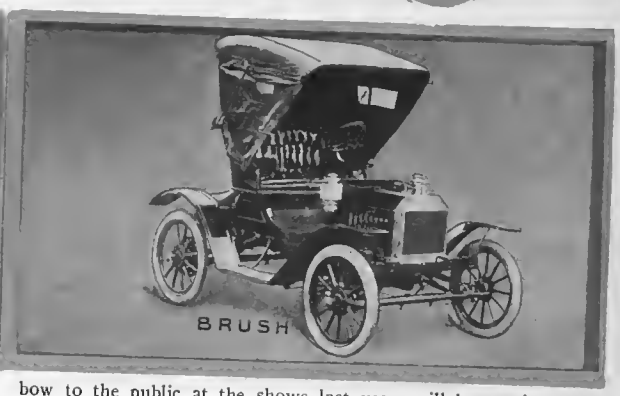




Moon.—Adhering to its past policy of devoting all its energies to the production of a single type of chassis, the Moon Motor Car Company, St. Louis, Mo., will feature the 30-35-horsepower car which is substantially the same as its predecessor for 1908. But it will be shown in four models, ranging from the three-seated roadster up to the seven-passenger touring car,

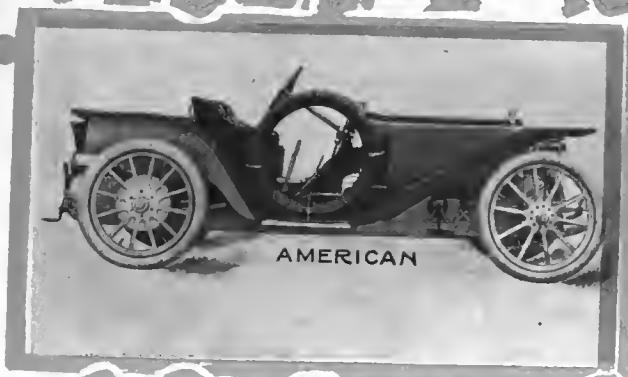
est number of purchasers, [illegible] Mora [illegible] will [illegible] a "Light Four" and a "Light Six" [illegible] to a [illegible] erful four-cylinder car, each one [illegible] with different styles of bodies, including the "Raceabout" [illegible] there will be an extended range to choose from. The Mora Motor Car Company, Newark, N. J., has been in [illegible] facilities considerably during the past few months and plans [illegible] made to turn out a much larger number of cars, for the season than ever before. Like their predecessors, they will be characterized by those features of design and construction that have served to make the Mora distinctive since its inception. Chief among these is the Mora [illegible] plant, the [illegible]





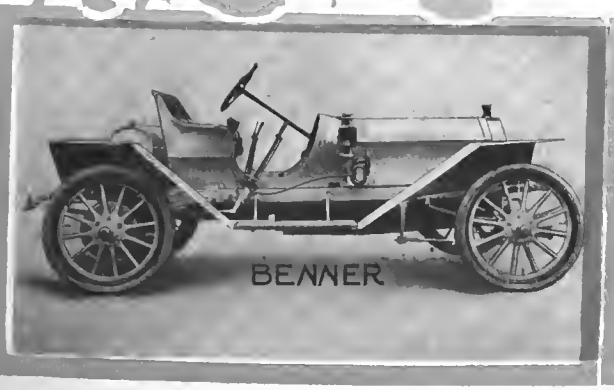
clutch and gear-set being mounted directly upon a cast aluminum alloy supporting pan, which is bolted directly to the side members of the frame.

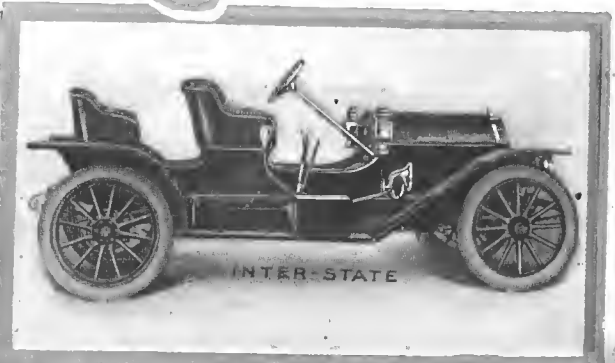
National.—This is the car that was made famous by the world's 24-hour stock car record and the happy phrase, "Watch for the Round Radiator," which latter phrase has not been given much publicity of late. However, this ball-bearing car of the National Motor Vehicle Company, Indianapolis, Ind., is just as good in every detail as when it made the 24-hour record. The ball-bearing feature is one that the company has much faith in, and it is retained in toto in the new models. This means that not only the crankshaft and both camshafts but also the transmission shafts, propeller shaft, all wheels, magneto shaft, practically every rotating part, will run on these friction reducers. As it has been ascertained that these bearings consume but 1-8 of 1 per cent. of the power delivered to them, this makes a very high-powered car, comparatively speaking, out of one with a medium sized motor. The power delivered at the rear wheel being such a large percentage of the motor power, a car thus equipped has a lesser weight per effective horsepower, which is a desirable feature.



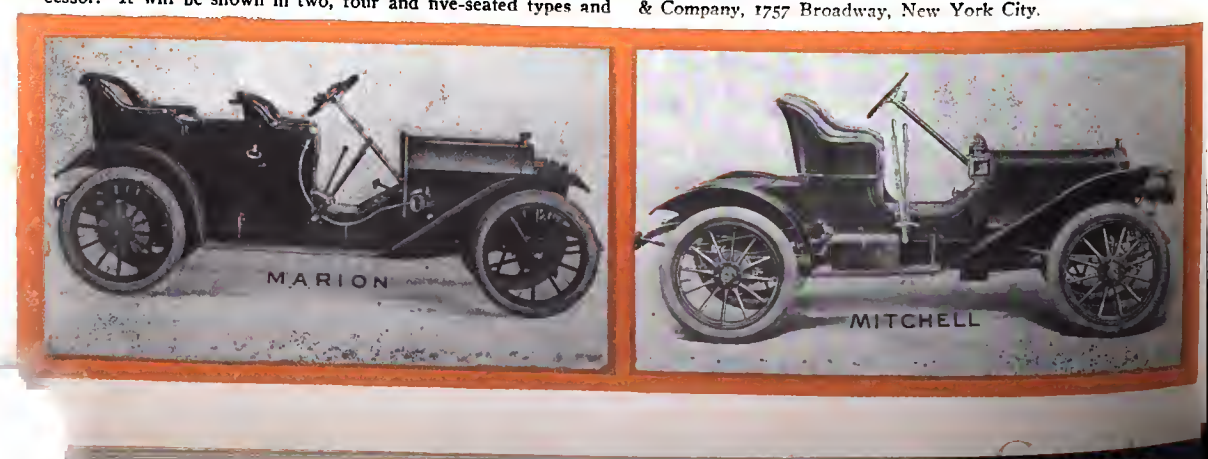
Oakland.—While the two-cylinder vertical 20-horsepower Oakland car with the special balancing system, with which the Oakland Motor Car Company, Pontiac, Mich., first made its bow to the public at the shows last year, will be continued in three different models for the coming season, the leader of the Oakland line will be a 40-horsepower, four-cylinder car, upon which Designer Alanson B. Brush has been working during the past summer. Although rated at 40 horsepower, it will not tip the scales above the 2,000-pound mark. Its motor has twin cylinder castings measuring 4 1-2 by 5 inches, the valves all being on the same side. A specially designed carbureter, a mechanical force feed oiler, centrifugal pump, and a storage battery working through the usual low-tension timer and coil constituting the accessories. A high-tension magneto is fitted as an extra. Roller and ball bearings are used throughout the chassis construction, the motor bearings being plain and very liberal in size. This also applies to the tires, which will be 34 by 4 inches all round.

Overland.—Prominent as a leader of the Overland line for the coming season will be the Model 30, which is a 30-horsepower car equipped with a four-cylinder 4 by 4-inch motor, Remy magneto, thermo-syphon circulation, tubular radiator, force-feed lubrication, cone clutch, shaft drive, and two-speed planetary change-gear set located at the rear axle. A worm and sector type of steering gear is employed and the wheelbase is 108 inches. As a runabout this car is listed at $1,250, while as a four-passenger car the price is $1,300. A distinguishing feature

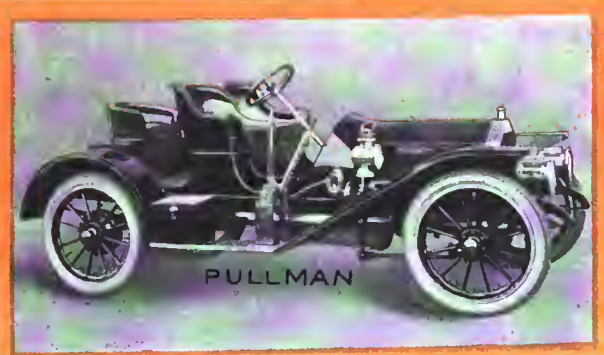




is 28.8 horsep[illegible], which shows that its title is only a nominal indication of its [illegible]bility in this direction. While it has been brought out to me[illegible] the demand for a small car, no [illegible] has been made to mee[illegible] competition [illegible] its design and construction [illegible] the same painstaking care that has always characterized its larger predecessor. It will be shown in two, four and five-seated types and fr[illegible] 34 h[illegible] rear. [illegible] Premier, which is equipped with a six-cylinde[illegible] 45-55-horse[illegible]wer motor, lists at $3,500. Its cylinder dimens[illegible] same as the smaller car, the extra pair of cylinders accounting for its higher rating, while it also has the same features of design, such as the three-speed selective gear and shaft drive. The Premier is marketed by R. M. Owen & Company, 1757 Broadway, New York City.



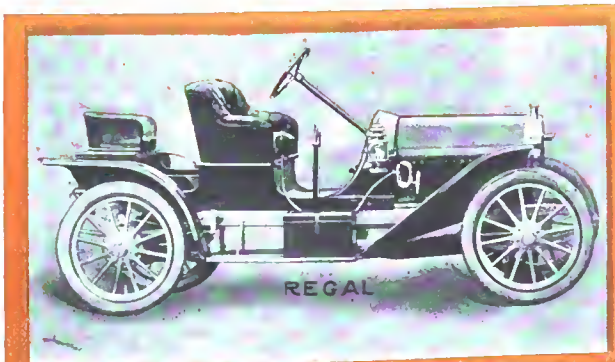
Pullman.—With everybody talking of small cars and preparing to build small engines, it must be a pleasure to be able to say truthfully, "I told you so," and back it up by several years' production of small motors. This is the unusual position in which the York Motor Car Company, York, Pa., finds itself to-day, having built a 3 3-4-inch by 3 3-4-inch four-cylinder motor for the past three or four years; a "six" 3 3-4 by 3 3-4 for two years, and a "four" 4 1-2 by 4 1-2, 4 1-2 by 5 1-4, for a similar length of time. Now another taxicab model is announced, having a four-cylinder 3 7-8 by 3 7-8 engine. This makes a total of five distinct engines by this firm, all 5 inches or smaller in diameter, and three of them are less than 4 inches in diameter. This long and varied experience in small motors should have given this company a large and commanding lead in this now popular form of construction.

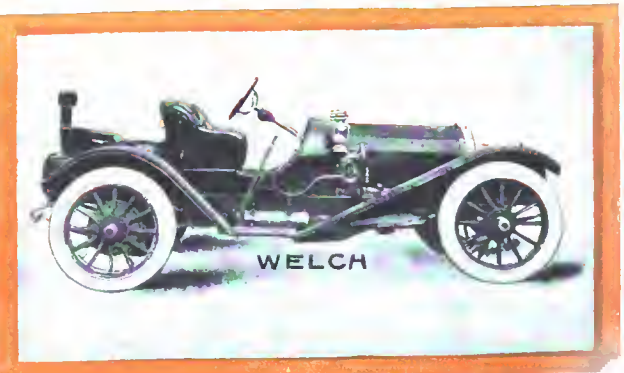


Rambler.—The Thomas B. Jeffery Company, Kenosha, Wis., will not exhibit at the Palace, but will entertain friends and patrons at the New York City branch showrooms, 457-459 Broadway, at which place the entire line of the company can be shown to better advantage than would be possible in a place not devoted to the undivided "Rambler" interest. For 1909 the company is in a position to enhance an already secure reputation with a line of cars apparently embracing everything that has a place in automobiledom.

Regal.—There are not many cars on the market at anything like the price of the Regal that can approach its value, which becomes evident upon an inspection of the car itself, in the shape of the care taken in the elaboration of the details. For instance, the valves are actuated by roller tappets—a feature not to be found on many higher-priced cars. The motor is a 4 by 4-inch twin-cylinder type, the design of which has been well worked out. Its accessories consist of a McCord radiator, circulation being on the thermo-syphon principle through unusually large connections, a Buffalo carbureter, and a Remy high-tension magneto operating through a single coil on the dash. An emergency ignition system is provided by means of a set of dry cells, the magneto distributer being common to both systems. The self-contained oiling system is a valuable feature. It consists of a gear pump at the lower rear right-hand corner of the aluminum oil pan. This draws its supply from the lowest part of the pan and discharges it into a tube running parallel with the crankshaft. It is drilled with a number of holes through which the oil is squirted out on the bearings. The Regal Motor Car Company, Detroit, Mich., are the builders.

Reo.—"Greater value for the money" rather than any





radically new models or changes in design may be said to concisely sum up the plans of the Reo Motor Car Company, Lansing, Mich., which is accordingly continuing the two models it has featured ever since it started in business. These are the two-cylinder chassis and the single-cylinder runabout, both being fitted with horizontal motors. The 20-horsepower two-cylinder chassis will be fitted as a regulation five-passenger touring car, or as a roadster with a folding rear seat, the list being $1,000 in either case, instead of $1,250 as last year, although the car has been improved and has been given several inches more wheelbase than formerly, thus making the tonneau much more comfortable. A similar cut has been made in the case of the runabout, which is now listed at $500 instead of $650 as formerly, though it has been similarly improved. In the case of the 20-horsepower roadster, a top forms part of the standard equipment and is included in the selling price given. The Reo is handled by R. M. Owen & Company, 1784 Broadway, New York City.

Speedwell.—The Speedwell Motor Car Company, of Dayton, Ohio, is putting forth its efforts for 1909 in the pleasure car line by producing three models of 40 horsepower each, the same motor being used in each case. The touring car and runabout list at $2,500 and the limousine at $3,500. The transmission is of the selective type, provided with three speeds and reverse, the power being transmitted to the rear wheels by propeller shaft and live axle. Ample foresight has been used in providing two sets of brakes, both acting on the rear hubs, one expanding and the other contracting. In other respects the Speedwell conforms to a certain standard of practice which has received favorable mentione on notable occasions.

Stoddard-Dayton.—Among the Western products to which that Western phrase, "Bright and breezy," may be employed, as indicating that they are always in the front rank and always right up to date, is the product of the Dayton Motor Car Company, Dayton, Ohio. For 1909 three bright and breezy right up-to-the-minute chasses will be built, furnished with a full range of suitable bodies. The chasses will have 25, 35 and 45-horsepower motors, all of the four twin-cylinder vertical type. These vary in price upward by steps of $500, the 25-horsepower car being low at $1,500. Despite a fire in its plant, the company bobbed up serenely with a very large production for the past year, and a still larger one promised for 1909. The smallest car has been redesigned, and with a larger and more powerful motor comes into the so-called "1,500" class, which is distinctly a Middle Western clan. But if the Middle West produces this line of cars it is a fact also that the East gets away with a lot of them. The Stoddard-Dayton is one of the cars that is much to be seen on the streets of the big cities all over the East, and it is to their credit to say they are popular in the extreme.

Welch.—Pioneer is a good word to apply to this Michigan product of a Pontiac shop, the Welch Motor Car Company, for the Welch Bros., designers and manufacturers of this car, produced in 1904 many forms of construction which are to-day considered absolutely correct. Thus this firm were pioneers in the production of the multiple disc clutch running in an oil bath, the truss reinforcement for the narrowed frame, the overhead valves and camshaft, and the completely finished spherical combustion chamber. The latter, featured by this firm for the past four years, is now accepted "on the Continent" as the form for racing cars, and, accordingly, all Continental racers are so equipped. The Welch company has gone one step further and applied this theoretically and practically perfect cylinder arrangement to all cars built by them. These will consist of two chasses, one four and one six-cylinder, with the usual range of bodies for each.

THE AMERICAN BUGGY TYPE

Anderson.—The present interest is in two models, one of which is fitted with solid tires and the other with pneumatics. Both models are provided with a 12-horsepower motor of the two-cylinder type, more complete data of which will be found in the general tables devoted to the subject. Model B has a three-speed transmission, while model C is with a two-speed transmission. In all respects the cars as made by the Anderson Carriage Company, of Anderson, Ind., will be capable of holding a prominent place in the hearts of users. The company realizes the need of a stable product in the class of trade to which they by the excellence of their wares claim the right to cater to.

Chicago.—Three two-cylinder and one four-cylinder model will comprise the main output of the Black Manufacturing Company, Chicago. Model 12 is a 14-horsepower car, seating two persons, selling at $450, which in itself will be something to take into account by the purchasing public. All the models, excepting the 40-horsepower four-cylinder car, are fitted with a two-speed transmission, while the 40-horsepower model has a three-speed transmission. This latter model sells at $1,250, and by this fact it will be rendered manifest that the company proposes to cater to popular trade, which, in view of the size and quality of the car, at the price, should realize that the Chicago is a good proposition.

Holsman.—Radical departures both from precedents previously adhered to hy its own designers, and from what is considered as more or less standard practice, characterize the new Holsman for 1909, the improvements in its engine design being such that its makers, the Holsman Automobile Company, Chicago, Ill., feel justified in terming it the "simplest automobile in the world." It has a four-cylinder air-cooled motor rated at 26 horsepower, which, however, is much simpler and more compact than the former Holsman motors of half its rating. It is distinguished by the use of anti-friction bearings throughout, either Hyatt roller-bearings or ball-bearings being employed, even on the connecting rods, which are of an entirely different type from the ordinary. Short pistons similar to those customary in steam practice are employed, and each pair for the horizontal opposed cylinders are rigidly fastened together. One of the new types listed for the coming season is termed the Holsman "Gentleman's Automobile," being an enclosed buggy type.

Kiblinger.—What is probably one of the most extensive lines of the high-wheel type of automobiles to be shown by a single house is now being listed by the W. H. McIntyre Company. Auburn, Ind. While nominally termed "high-wheelers," the Kiblinger cars are in several instances mounted on running gear having wheels as low as 34 inches, but the latter are of the buggy type and are shod with solid tires. With the exception of the Model M, 27-horsepower car, which is equipped with a four-cylinder motor of the vertical type, all of the Kiblinger models are fitted with two-cylinder horizontal opposed motors. The latter are in two sizes, four models being fitted with 16-horsepower motors, and three with 13.5-horsepower motors, all being air-cooled. The planetary type of change-speed gear giving two speeds forward and reverse is employed in every case, the different models ranging from $450 to $750, according to size and power. Their seating capacity ranges from two passengers in the case of the runabout up to six in the case of the surrey.

Schacht.—The model K is an 18-20-horsepower car with a two-cylinder motor, and the scheme of transmission affords five speeds. The price of the car is $680, which is low enough to reach the pocketbook of the most conservative buyer, and it is pretty generally understood that the cars of this make are quite up to a fitting standard. The Schacht Manufacturing Company, of Cincinnati, Ohio, is the maker of the cars.

EUROPEAN CARS IN AMERICAN DEMAND

NO plans having been made for holding an "Importers' Salon" this year, the representatives of European manufacturers in this country decided to cast their lot with the "Indcpendent" American makers, and are accordingly holding forth in the Palace show. Influences responsible for the growth and sale of American cars have likewise worked a revolution in the demand of the American market for the imported car. At thc outset, the importers had the field without much interfering competitiou; there was not an American car that could stand comparison witb the product from abroad for the moment and importing flourished accordingly. Conditions have changed rapidly since then, and with each succeeding year the United States has become a more and more difficult market for the imported car. But despite the fact that America now annually turns out by far thc greatest number of automobiles produced by any one country and exports no small percentage of them, it offers a market so wide that there is still room and to spare for the foreign manufacturer to dispose of a percentage of his product.

But the European must be prepared to meet strenuous competition, and in order to succeed in this must do business *à la Americaine*, if he would dispose of any considerable fraction of his output on this side of the Atlantic. In other words, the time has come when the business of importing forcign automobiles and selling them here has come down to a business basis, and those importers who are desirous of continuing as such have found it necessary to realize this fact and guide themselves accordingly. Otherwise the inexorable mill of competition will surely eliminate them, just as it has numberless American concerns whose backers had small knowledge and no experience of the requirements of successfully marketing automobiles.

Benz.—The makers of the Benz can doubtless lay claim to being the oldest manufacturers of automobiles extant, and were responsible to a great degree for its development in earlier days. It has only been within the past year or so, however, that they have made any attempt to enter this market, the Benz Auto Import Company of America, New York City, now being the agents on this side of the Atlantic. The showing in the Grand Prix of the A.C.F. and its excellent performance in the Savannah cvent, in both of which races it scored a very close second, have served to bring the Benz into considerable prominence, so that the models on display at the Palace will doubtless be inspected with more than passing interest. The German manufacturers plan to make a strong bid for American business, so that the local branch's exhibit includes quite a showing of models.

C.G.V.—The Charron, or C.G.V., as it is more familiarly known, was one of the first French makes to come into this market, where it has been a factor of importance ever since. A large number of these cars have been imported during the interim, but they have never been shown in such a wide range of models as now are to be seen at the Palace. In fact, the C.G.V. Import Company, the New York agents, can probably lay claim to the distinction of showing both the smallest and largest cars on the floor, as their line begins with an 8-10-horsepower model listing at $2,500 and ends with a 90-120-horsepower chassis listing at $10,000. Between these two extremes, the lowest of which represents a two-cylinder town car, there is a range sufficient to meet every demand. For instance, there are 12-15, 15-20, 20-30, 30-40, 50-60 and 75-90-horsepower models, all being equipped with a four-cylinder type of motor. The 12-15-horsepower model is shown complete with body in two types, listing at $3,000 and $3,250, the remainder being listed as chassis alone.

De Dietrich.—The De Dietrich Import Company, New York agents for this car, show a line of models, which, like most of their competitors, runs largely to small powers, for the French maker has awakened to the possibilities of the small car in no uncertain manner during the past year, and instead of devoting his attention to one or two high-powered types, is now in a position to meet the wants of the purchascr of a car of almost any size, from the smallest to the very largest.

DeDion.—The name DeDion is associated with the earliest appearance of the foreign-made automobile in this country, and for the first two or three years not a few machines of this make were sold in this country, though they were principally of a voiturette type which has since completely disappeared. During most of the interim the company has not been actively represented here. The De Dion-Bouton Selling Branch, 32 Cedar street, New York, is now the American agency for this car.

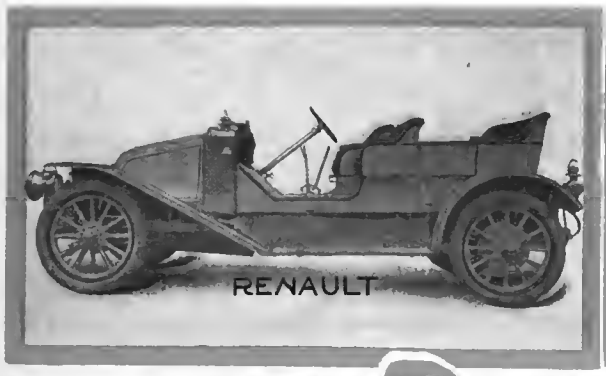
Delaunay-Belleville.—Up to within the past ycar or so this was a car which, though bearing an excellent reputation abroad, was very little known here. Brewster & Company, New York, the old-established carriage house, has recently taken the American agency, and are showing one or two models, which will be supplemented later by a more complete range of powers.

Fiat.—The importers of this car, the Fiat Automobile Company, New York City, will have an ample line to choose from during the 1909 season, the models ranging in power from a four-cylinder 12-horsepower car up to a 60-horsepower model of the same number of cylinders, or a 45-horsepower six-cylinder type. In all there are no less than seven models, the chassis prices ranging from $2,750 to $7,250.

Hotchkiss.—The Hotchkiss Import Company, New York, American agents for the well-known French artillery makers, will put forth a greater effort for business in this country during the coming year than previously, as is shown by its exhibit. The company is one of the first import agents to adopt the American plan of listing its cars complete with body.

Isotta.—In order to be in a position to meet the demand for an extended range of powcrs, the Isotta Import Company, New York City, American agents for the Italian builders of the Isotta, is showing a linc of models from 14 to 50 horsepower. These are the 14-20-horsepower chassis listing at $4,250; 18-24, listing at $4,500 and $4,600, the latter having a slightly longer wheelbasc, but being otherwise the same; the 15-25-horsepower at $5,250; thc 40-45 at $5,600 and the 50-65 at $8,500. With the exception of the 15-25-horsepower model, all are four-cylinder types, the latter heing a six. This car has placed itself so prominently hefore the public, through its highly consistent performance in every racing event in which it has becn entered, that the features of its design have become so well known as to scarcely call for comment.

Lancia.—Italy has always had to look beyond her own confines for an extended market for her automobile products, and the United States have provided no small outlet for Italian cars in past years, so that it is quite natural that this new creation from the works of a racing pilot who is as well known and liked here as in his own land should be popular in the American market. But even had the car not his prestige to back it, the manner in which the Lancia has performed wherever it has becn entered in speed contests would have been more than sufficient to give its name far more than the ordinary prominence, for its work has shown unmistakably that for power, speed, endurance and regularity of running, there are few cars in its class that can approach it. At present the 12-18-horsepowcr and the six-cylinder chassis are being handled here by the Hol-Tan Company, 244 West Forty-ninth street, New York, which is the American agent. This department, in charge of Harry Fosdick, shows a line comprising several models, the foreign practice of selling the chassis and body separate being followed, although

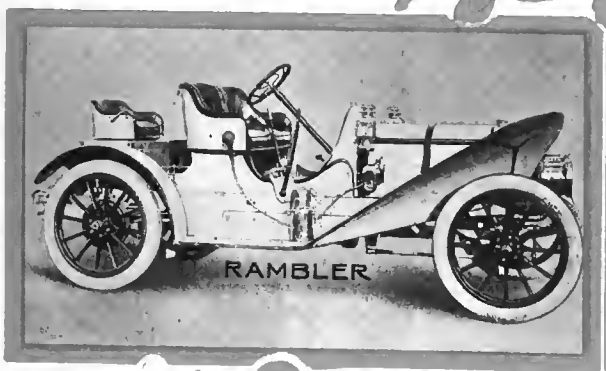


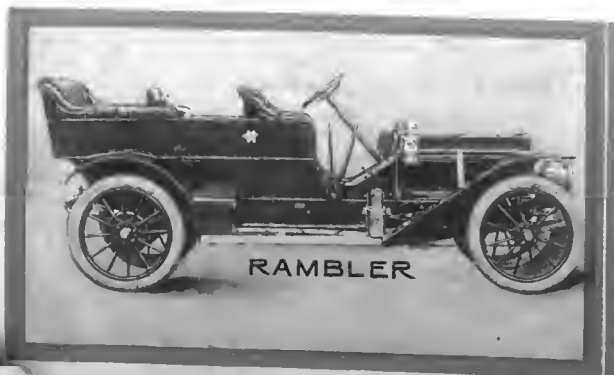
models complete with bodies, such as the touring and town car types, are also listed. The 12-18 chassis lists at $3,000; fitted as the "Lampo" racing car of Savannah fame at $3,300, with a touring body the price is $3,500 and as a town car, $4,000. The six-cylinder chassis, the cylinders being the same dimensions as the 12-18, lists at $3,500.

Mercedes.—The exhibit of the Mercedes Direct Import Company, New York City, is limited to a 35-horsepower shaft drive car, in relation to which the body is attracting notice. This body is styled a "double phaeton" landaulet, and is one of the first of the kind to come over. In outside appearance the car, enclosed, looks like an ordinary landaulet with an extension over the driver and a glass front. However, the body is so built that it can be collapsed and it then takes on the appearance of a touring car. This is due to ingeniously folding the top and the dropping of the windows. Incidentally, the Mercedes as a shaft drive will make something of a commotion. The "Bosch" magneto is used on this car.

Panhard.—Never before has the Panhard been seen in this country in such a variety of models as are now on display by Panhard & Levassor, the New York branch house of the well-known French factory. These range from 8 to 80-horsepower and from two to six cylinders, though naturally by far the greater part of the showing consists of fours.

Renault.—Probably no foreign manufacturer has had such an excellent conception of the requirements of the American market as Renault Frères, and certainly none has always kept in such close touch with developments here. The Renault cars have always sold freely here ever since they were first introduced, and the company's interests grew to a degree of importance where a branch house became a necessity, this being the Renault Frères Selling Agency, at 1776 Broadway, New York City, of which Paul Lacroix is manager. Having a branch manager right in the field, this house has followed changing conditions as closely as any American manufacturer, and must be accorded the credit of being the first to realize that an extensive business could only be done here by following American methods. This the Renault Frères have done by bringing out types of chassis especially for this market and by establishing branch agencies in Chicago and San Francisco, showing in no uncertain manner that they are not only out for American business, but also that they know how to get it and will be in a position to take care of the goodly share that does come their way. The showing of Renault cars is one of the most complete lines of foreign cars staged at the Palace. They are also to be seen on the street and are known even by the "arabs" because of their distinctive appearance, the Renault front being quite different from cars in general.





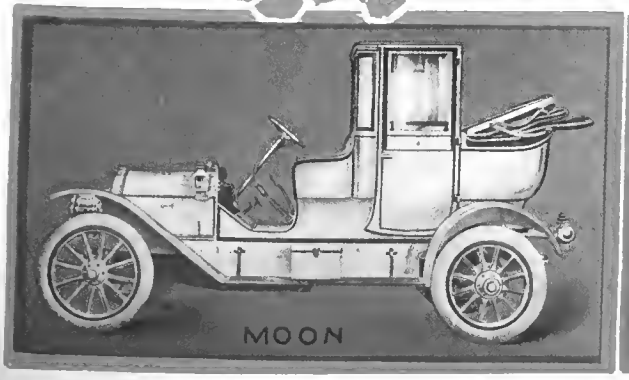
IN THE TAXICAB DIVISION.

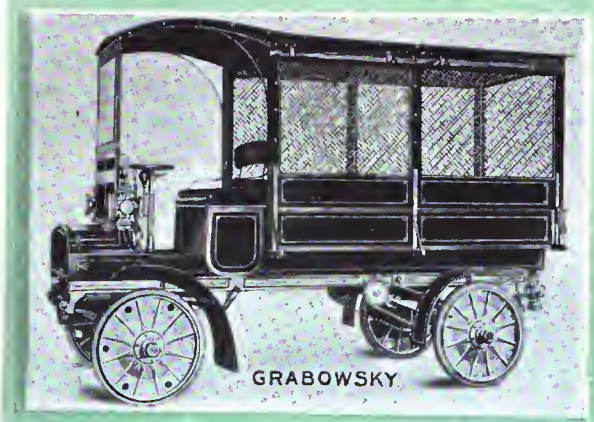
This is a question that is not likely to run into models by the score, since in the service end individual buyers of taxicabs are few and they are more interested in specialized products, usually the outpouring of the older companies after they have satisfied their regular trade. Against this is the fact that some companies make a specialty of taxicabs from the start, never attempting to turn out anything besides. At all events, the situation as it presents itself at the show is one of the greatest interest, in view of the fact that taxicabs have proven to be of masterly commercial value, and the makers of cars, having tasted blood in the taxicab line, are after more delivering quality in the cars as the incentive.

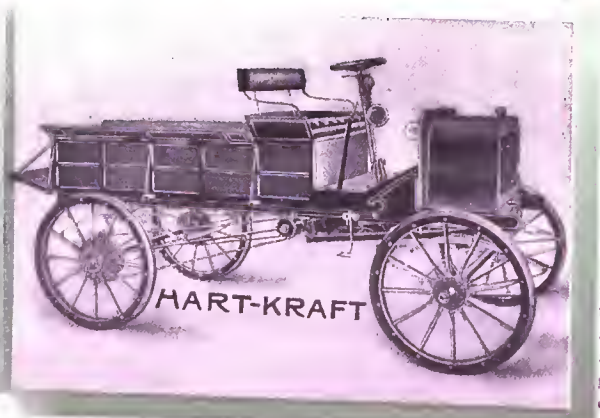
It was only a couple of years ago that the question was handled as a phase of the small touring car proposition, and even now it is not uncommon to observe examples of the converted touring car. It must be remembered, however, that tourings cars are with a longer wheelbase than the same measure in taxicabs, rightly so, in view of the fact that the taxicabs have to make headway in congested streets, and this is not easy if the cars have a long wheelbase and the streets are narrow, as they are in many cases.

The trend is by way of taxicabs that are not with a long wheelbase, nor high powered, since they are not geared to a high ratio, hence the power required is not nearly so much as that of the average touring car. But if the power is low in comparison it is a fact that the control is very perfect, and the cars of the class under discussion are very nimble indeed. Besides ease in handling, these cars are very simple in point of detail, and the labor that must be used in their operation seems to be able to cope with the problems in a manner less cramped than that attending the operation of touring cars. The taxicabs to be seen at the show do not represent all to be had, because it is usual to exhibit models of cars such as will be more likely to interest the patrons in general rather than to attract the attention of the possible single purchasers of taxicabs.

But it would be an incomplete termination of the subject to fail to mention the splendid business that is directly due to this class of automobiles, nor will the traveling public fail to appreciate the means of transportation that enables them to combine business and pleasure. That the horse will have to go, is a matter too settled to require further discussion, unless it is to point out that in the taxicab will be found the most potent reason of them all. The earlier uncertainties were those involving the relative cost, which in the computation did not take into account the "radius of action" of the taxicab.







THE COMMERCIAL VEHICLE INDUSTRY.

The automobile industry has been called the most progressive industry in the world, but surely if this is to be taken literally it must have an addition so that it will read, "excepting only the commercial vehicle industry." If the latter could be separated out from the former it would easily be accorded the premier position. The little work that has been done in the past is, as one might say, only a drop in the bucket to what is being done to-day, while the latter in turn occupies the same position toward the future.

To-day any sub-division of this industry into clearly-defined branches may be made, many of these being possible. These sub-divisions, in turn, may be selected at random and any one of them will show a most unusual progress. This progress has taken on various forms, to specify any one of which would be to delve into the minor details, which is not the purpose here. However, to generalize and at the same time be specific, the subject of motors may be mentioned. The progress in this line may be summed up in the statement that the light and possibly complicated engine of the pleasure car has been divorced from the commercial vehicle. The tendency toward simplification everywhere manifested is here shown in the elimination of the ultra-lightweight metals of high first cost in favor of better known and more stable materials of a low price per pound; in a word, the substitution of cast iron for aluminum. In addition, there is the relative increase in stroke with a corresponding decrease in speed, which may be summed up as the substitution of the long stroke slow-speed motor of long life for the "short" high-speed engine of comparatively short existence. This example brings out a point which stands out clearly in the whole list of commercial improvements, and that is, the decrease in repairs or maintenance, due to the additional skill in designing and superior choice of materials.

This being an item which either encourages or discourages the new convert to the power wagon is of vast importance and far-reaching in its results. Therefore, it is well worthy of careful attention. A specific instance of this under another sub-division is the matter of tires. This has been given most careful attention, both by the tire and the car manufacturers, and well it might, for of all the items which have demanded attention in the past, that of tires has up to very recently received the least. This lack of attention has manifested itself in the use of the tire which cost the least, regardless of the prospective service. It has cropped out in such shapes as the use of one-and-a-half ton tires on three-ton trucks. Naturally this spelled quick tire depreciation, each hardly-won convert soon sliped back to horses, and the truck became known as a "tire eater." It is pleasing to note in this connection the increased attention now being given to this subject by both sides.

The first wheels were merely larger pleasure car wheels with no visible difference. To-day we find the two as different as black and white. The truck wheels are now very properly built for truck use with heavier, more rugged, and long-lived parts correctly proportioned to the work, and account taken of the inevitable and ill-advised overload. The weakest portion of the wood wheel is the junction of the spoke and the felloe, or rather at the reduced diameter of the spoke where it enters the felloe. A recent movement among the English heavy vehicle manufacturers has as its object the elimination of this weak point. This is accomplished by the gradual widening out of the spoke from hub to felloe and the change from a round to a flare end, with a vastly increased area at the breaking point. In this connection, all steel wheels are receiving much attention for important work, and those in use have given satisfaction.

The matter of noise is one that is becoming of larger importance every day, as users of good vehicles find that noise is separable from the proper operation of cars; in other words, as they find out that it is possible to have a noiseless vehicle operate as well as a noisy one. This was for a long time considered as an exclusive feature of the electric, but that is losing ground daily. The change has been brought about by successful use of chain cases, silent chains, and of the worm

drive. A similar desired result has been the reason for the use of the panetary transmission on small cars and of the individual clutch type on larger cars.

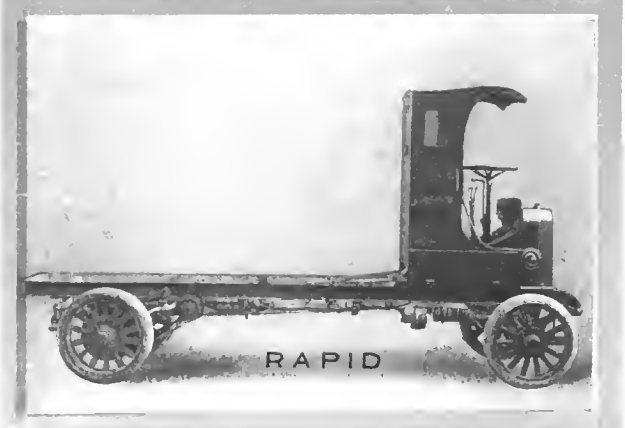
Simplification and increased strength is everywhere noticeable with a distinct absence of that feature of some pleasure cars known as "over-designing." The tendency is to make one simple part do the work of two complicated ones, if possible. Such outcroppings of this as the absence of spark advance have made possible the use of men of more limited intelligence and consequently lower price as drivers. This was a point formerly overlooked, but is now given its proper share of attention, so that one would be safe in saying of some truck, "that vehicle was designed to be driven by a $12-a-week horse driver." This statement upon analyzation is seen to include the points previously dwelt upon, viz., simplification, elimination, strength, and stability. These four words spell progress when applied to the commercial vehicle industry.

American Truck.—The American Motor Truck Company, Lockport, N. Y., covers the field completely with seven regular models, ranging from a 20-horsepower one-half ton commercial known as Model T, to Model O, which is rated at five tons, and is equipped with a 65-horsepower motor. Three of the line use a two-speed transmission, and with ample power through the good offices of a four-cylinder motor, it is not to be wondered at if the system is regarded as an unqualified success. The models with motors rated below 40 horsepower are equipped with three-speed transmissions, and it will be understood that a reverse is included in every case. In sight-seeing work, the American is very well known, and the same company is making inroads in "stage" service. It is to be noted that in general trucking and delivery service the American products are most in use.

Brush.—This maker will concentrate his energy and factory capacity upon one type and model of light delivery wagon. That single product of the Brush Runabout Company, of Detroit, Mich., probably possesses more original features than any other car of a similar type upon the American market. Beginning with left-hand control, coil springs, wood axles, single-cylinder vertical motor, etc., right through the car, this originality crops out and makes this what the maker desired it to be, a decidedly different vehicle. No doubt, when the buying public has been educated to see the advantages of these "decidedly different" features, we may expect that they will sell in very large numbers, as Brush has selected the largest field of all, the small dealer or trader who handles very light weights. This little car weighs but 950 pounds and is built to carry 500 pounds normally and 300 pounds overload, making a maximum weight, when fully loaded, of 1750 pounds. The single cylinder 7-horsepower motor will, then, never have over 250 pounds per horsepower, so that the power provided is ample. In addition, these cars are geared down very low, so low, in fact, that a speed in excess of 14 to 15 miles per hour is impossible.

Cleveland Autocab.—The idea of the Cleveland Autocab Company, Geneva, O., is to place at the disposal of users a reliable "taxicab" quite up to the requirements in view of the arduousness of the service, and to leave out every possible complication. The four-cylinder motor, of a well-designed type, has cylinders 3 7-8 x 4 inches, bore and stroke, respectively, and a multiple disc clutch transmits the power to a three-speed gearset. In all the details, from the taxicab point of view, the product of the company is well worth the serious attention of users of cars of the class, and it is pleasant to note that the trade in this line is so brisk as to vie with the other branches of the automobile trade.

De Dion.—This old and favorably known company has from the first recognized the value of taxicabs and the examples of this make are conspicuous factors in this class of work. Among the "foreign contingent" the De Dion is regarded most favorably, not only because of the nice appearance the cars make, but in view of the reliability that has always been a feature of the products of the company. The American end of the business is handled by the De Dion Bouton Selling Branch, 32 Cedar street, New York City.



Gramm-Logan.—From a delivery wagon to a 3-ton truck, ranging in price from $1,600 to $3,500, the situation from the commercial point of view is in a very healthy state. The three models are each with four-cylinder motors, and all but the delivery wagon have transmissions with three speeds and reverse. The delivery wagon and the 1 1-2-ton truck are provided with a 25-horsepower motor, while the three-ton truck is equipped with a 45-horsepower motor. This product of the Gramm-Logan Company, of Bowling Green, O., has by its conservative practice and the excellence of its product made itself known for its good work in every industrial center. For additional information, the general table of cars may be consulted. In the meantime it may not be out of place to point out that this company has gone into the question of the body work in commercial service, and it is to its efforts largely that the commercial automobile has jumped to great popularity. It is all very well to have a fine chassis, but when all is said, it is important to have a stable and commodious platform on which to rest the goods to be transported.

Hart-Kraft.—For commercial work the product of the Hart-Kraft Motor Company, York, Pa., has a wide range of uses and is becoming very popular, indeed. The model A-0 chassis is available for any purpose that occasion may demand, while models A-1, A-2 and A-3 are used for delivery wagons. The data of these delivery propositions will be found in the general tables, and it will be the idea to limit discussion here to a résumé of the top facts. The motor is the same for all of the models, rated at 14 horsepower, is of the two-cylinder type, and is provided with a two-speed transmission. This company has the right idea when it comes to light delivery work in which time is a large factor. The Hart-Kraft delivery wagon has a wide radius of action and speed in the process. Stores do not have to deliver heavy burdens so much as they do innumerable packages, which are wanted the day they are ordered.

Holsman.—The delivery wagon is an outgrowth of the high-wheeled or buggy type of car produced by this maker, the Holsman Automobile Company, of Chicago, Ill. This wagon has the large 42-inch and 48-inch wheels, made popular by the motor buggy, these being equipped with 1 1-8-inch solid tires. While other makers wondered if the steel cable drive was all right, this manufacturer with accurate foresight proceeded to use it and proved its quality in actual service. The two-cylinder horizontal opposed air-cooled motor and tubular steel frame so lend themselves to light weight that the vehicle ready for service weighs only 930 pounds. With a load of equal weight the ratio of total weight to power will attain the very low figure of 145 pounds per horsepower, as the 4 x 4 two-cylinder motor, while rated at 12.8 (upon which basis the above ratio was figured), will develop quite a little power over and above this rating. In the hands of the ignorant horse driver, usually employed on delivery wagons, this simple machine, with the absence of the water circulation, and consequent simplification, should do very well.

Gaeth.—Ever since Paul Gaeth has been devoting his attention to the manufacture of automobiles, both before and since the formation of the Gaeth Automobile Company, of Cleveland, he has given a great deal of time to perfecting a single-cylinder type of car for commercial purposes, this now being listed as Gaeth Type K, for the coming season. Its power-plant consists of a single-cylinder horizontal motor rated at 12-15 horsepower, while the change-speed gear is of the planetry type, giving two speeds forward, the power reaching the rear wheels through double side chains, thus making the car as a whole as simple as it is possible to design it, so that it can be depended upon to render constant and efficient service in the hands of the most inexperienced driver. The Gaeth Type K delivery wagon has a load capacity of 2,000 pounds and is very economical to run and maintain.

Grabowsky.—One of the biggest, if not the biggest, item in holding back the progress of commercial wagons has been the troubles due to improper maintenance, many a man who looked after his horses and wagons properly failing to give the power wagon a thought, with natural results. This has now been obviated by the Grabowsky Power Wagon Company, of


HOLSMAN


CHICAGO

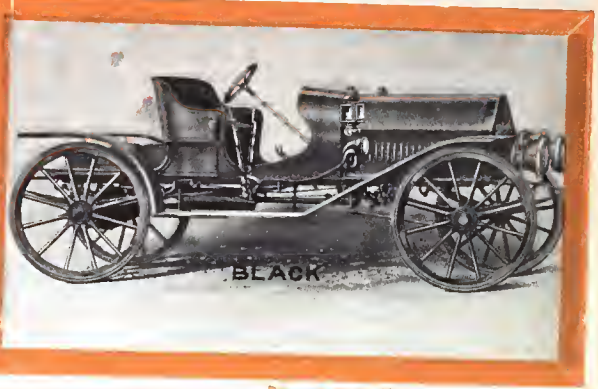
Detroit, Mich., who sell all of their nine commercial vehicles upon a maintenance basis. This scheme includes the entire maintenance, care, repair, washing, cleaning, etc., necessary to keep the vehicle running all day and every day. With this in view, the Grabowsky Company is establishing maintenance garages in the larger cities where they propose to sell their cars. The full line to date includes delivery wagons, one and two-ton trucks, ambulances, police patrols, fire wagons, seven, ten, and


KIBLINGER

twelve-passenger buses, and sight-seeing cars. All these are equipped with the Grabowsky type of quickly demountable power plant, consisting of two cylinder opposed engine, two-speed planetary transmission, water-cooling, and ignition systems grouped at the front end upon a sub-frame, the whole being removable it is claimed in about three hours.

Kiblinger.—The delivery and mail wagons by this motor buggy concern, the W. H. McIntire Company, of Auburn, Ind., while possessing all of the other motor buggy characteristics, do not have the wheels of large diameter peculiar to this type. Instead, the wagons are equipped with small 34-inch wheels, which, however, have buggy tires 1 1-8 and 1 1-4 in size. The other features, such as angle iron frame, horizontal opposed air-cooled motor, planetary transmission, double chain drive of the roller type, etc., which have been successfully used on these well-known motor buggies, have also been applied to the two types of commercial wagons. The power equipment of the two is ample for any service it may go up against, the mail wagon having a motor conservatively rated at 13-horsepower, while the motor on the delivery car will easily develop more than the 16-horsepower claimed for it.

Lansden.—The name of Lansden has been chiefly associated with commercial types of electric vehicles employing the Edison alkaline storage battery as the source of current, though pleasure vehicles have been made by this firm from time to time. In its business of turning out commercial vehicles, the Lansden Company, Newark, N. J., has naturally devoted its attention to a range of types as extended as the wants of its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numerous customers. For the 1909 season, there will be added an electric brougham and a taxicab type of attractive lines, the latter naturally being available also for private use as a town car. The numerous features of design and construction that have combined to make for successful service and low cost of maintenance in the Lansden commercial cars will be embodied in these two new cars.

Manhattan.—Among the pioneers in the power wagon busi-


HART-KRAFT


RELIABLE DAYTON

ness who are still in existence is Mack Bros. Motor Car Company, of Allentown, Pa. The name of this car has been taken from the city which this maker claims as his particular field and where he has sold most of his output in the past three or four years; viz., New York City. All cars, regardless of size, weight, and service, are equipped with the same engine and transmission. The transmission of the individual clutch type affords three speeds forward and reverse. This is a rather elaborate piece of mechanism to put into the hands of the ordinary truck driver, having no less than ten imported ball bearings, a very light aluminum case, delicate gear shifting forks of friable material, and other similar points. The full line includes 2, 3, 4, and 5 ton trucks, buses, and sight-seeing cars of 12 to 22 passenger capacity, a special car now under construction having a capacity of 28.

Maxwell.—Among the pleasure car manufacturers who have turned their attention to the broader field of commercial cars is the Maxwell-Briscoe Motor Company, of Tarrytown, N. Y. But one model has been produced thus far, this being a light delivery wagon of about 1,000 pounds carrying capacity. This has all of the characteristic Maxwell features and is one of the very few commercial cars to be equipped with pressed steel frame, multiple disc clutch, and sliding gear transmission. The wheels are small with 30 by 3 1-2 solid tires on the front and 30 by 4 on the rear. A wheelbase of 90 inches allows turning in a very short space and easy manipulation in crowded streets, both very good features on a commercial delivery wagon. The weight of 1,700 pounds is well proportioned to the power, which latter is produced by a 5 by 5 two-cylinder opposed motor, cooled by the thermo-siphon circulation of water. This 20-horsepower will give 85 pounds per horsepower light and 135 pounds loaded. The well-known Maxwell radiator with the four-inch wide brass band is used to complete the cooling system.

Rapid.—The Rapid Motor Vehicle Company, Pontiac, Mich., which previously had a very complete line of vehicles, has now added a five-ton truck. This company, devoted to commercial cars exclusivcly, is producing police patrols, fire wagons, ambulances, opera and other buses, sight-seeing cars, delivery wagons, and trucks. With the exception of the latest arrival, all of these successful vehicles have a two-cylinder motor of the opposed type, size 5 1-4 by 5, rated at 24-horsepower. The big baby of the lot, however, has a four-cylinder vertical power producer, with cylinders 5 1-2 by 6 1-2. While the others have a two-speed planetary, this has a three-speed sliding gear, operated on the selective principle.

The "rubberneck" wagons vary in capacity from the smallest to the largest, the former carrying as low as six, while the latter run up to 22, with a 28 and 30-seater, which will be built on special order. The wide range of this company's line of cars in itself predicts a very wide field of usefulness and a consequently large and widely distributed product. It is, therefore, not surprising that each succeeding year sees a large addition to the factory, made necessary even in years like the past, when not a few makers were obliged to try hard to land any kind of an order, no matter how small.

Reliance Trucks.—The line of heavy trucks formerly manufactured in Detroit, Mich., by the Reliance Motor Car Company, which also built pleasure cars, is now being continued by their successors, the Reliance Motor Truck Company, of Owosso, Mich. The new company will devote themselves exclusively to trucks in the 2, 3, 4, and 5-ton sizes, and 12 to 26-passenger wagons. The whole line will be equipped with two-cycle motors, the number of cylinders varying with the load from two cylinders on the lighter cars to four on the very heaviest. The chassis follows standard truck practice; otherwise, the driver being placed over the motor. The use of the two-cycle engine allows the employment of cheaper drivers, on account of its well known simplicity. This feature is one that has been a big factor in the large sales of these trucks.

Renault.—Among the taxicabs the Renault has taken hold with a grip that might have been foreseen in view of the record of Renault cars in other zones of activity. The motor is especially suited to cab work because it is short, and the chassis of the cab must also be short. The Renault transmission gear is one that seems to hold favor among drivers, and it is a recognized fact that if a man likes a thing he will take enough interest in it to become acquainted with its needs. In taxicab work in particular the personal equation is of the greatest moment to be confined to assured control. In a word, it is not so much a question of how good a cab is as it is a matter of how well the operator will get on with it. The future seems to promise well for the Renault Frères Selling Agency, which is located at 1776 Broadway, New York City.

Rockwell.—One of the newcomers in the commercial field is the Bristol Engineering Corporation, of Bristol, Conn. This concern, which is well and favorably known in other lines, has now brought out an excellent taxicab, not merely a side step from pleasure car production, but a new and original design with many commendable features. The list of parts would show only a standard car of small dimensions with four cylinder motor under the hood, selective three-speed transmission shaft drive, etc., but to delve below the surface would be to find that the parts are standard in name only, the details showing a remarkable quality of up-to-dateness. But one model is produced with 3 5-8 by 4 1-8 motor, rated at 20-horsepower, equipped with landaulet body, and furnished with any make of taximeter.

Sultan.—This "town-car" proposition at $3,000, with a body that seats six, is fitted with a 10-12-horsepower motor and a three-speed transmission, more complete data of which will be found in the general table. The Sultan Motor Company, of Springfield, Mass., proposes to set the pace when it comes to service such as this, and the model above referred to promises to become one of the most popular of the day.

MICHIGAN CLUB WANTS A HOUSE.

GRAND RAPIDS, MICH., Dec. 21.—The Grand Rapids Automobile Club has found that its prospects for a new club house for the next season are very bright. Four plans are now offered, one to buy or lease the club house at Cascade used by the club in 1907, which is favored on account of the pleasant eight-mile drive. Another is the use of the Highland Golf Club house jointly with the golf club. The other plans are to have a club house erected on Grand River, about nine miles west of the city, in the midst of the fruit belt, or the party negotiating with the club offers to put it anywhere the club may desire.

The committee chairmen chosen by the newly elected president, J. R. Jackson, for the following year are: Club house, Dr. D. Emmett Welsh; law and ordinance, Charles B. Judd; auditing, M. D. Elgin; membership, Frederick Z. Pantlind; good roads, A. S. Rathbun; tours and contests, W. D. Vandecar.

CLUB NEWS IN GENERAL.

Elmira, N. Y.—At a recent meeting of the board of directors of the Elmira Automobile Club a resolution was passed renewing membership in the New York State Automobile Association which carries with it membership in the A. A. A., which latter body was endorsed. About 20 new members were elected, and the new president, Clay W. Holmes, appointed the membership, finance, good roads, laws and ordinances and entertainment committees.

Milbank, S. D.—The Milbank Motor Club has been formed with the following officers: President, J. W. Ross; vice-president, G. L. Wood; secretary, P. C. Saunders; treasurer, G. C. Middlebrook. The club will make road improvement its principal object, the roads in Grand County coming first on the list.

Oklahoma, Okla.—The Oklahoma City Automobile Association has pledged $10,000 for the construction of a 25-mile speedway around the city.

Staten Island, N. Y.—The Richmond County Automobile Club is planning a new club house, to be finished next spring, at Grant City.

ACCESSORIES REPRESENT A VAST BUSINESS

IF the show is rich in automobiles, both commercial and for pleasure, it is equally profuse in its representation of the great industries that have grown up around it as a boon companion. The accessories on exhibition are of every kind and description, from tires to tops, for the cars, and gauntlets to gowns for the patrons. They represent all the devices for ignition purposes, as magnetos, timers, coils, batteries, wire and the incidentals that space forbids mentioning.

A little further along and the question of lubrication is dealt with, from the finest of mineral oils to the hardest grease, varying the monotony by illustrations of the application of graphite. If the lubricants are in plenty, it is not to overlook the many devices for their efficient use.

From the lubricants to fuel and the means, is but a step.

Of carbureters there are the best examples of the industry, side by side, with choice as impossible as the selection of the superior of peas in a pod. As well as carbureters, there are tanks, piping, fittings, pressure-regulators, pumps, and last, but not least, all devices for safe and efficient storage of gasoline.

Lighting equipment is so profusely and so well represented that any attempt to discuss the matter is almost futile. Acetylene is favored largely; of generators there are many fine examples, and the storage tanks are there as well. Lamps are bigger, better, and with all the old strictures, as a memory, at rest in the grave of forgetfulness. Oil lamps are in fine style, as emergency necessities and for "town service." Electric lighting is in vogue, and the means are at hand. This is of more than passing interest, since autoists are rather fond of electric lights, having used them on electric vehicles. Tools—they are all there.

The tire problem of to-day as it is portrayed at the show, is the problem of selection. In this line competition is so acute that there are no bad tires, and there are no cars using tires so small for the work that they will not well serve the purpose. That there are selections, depending upon the service to be rendered, it is true, but the question is one to be disposed of by the users of cars, aided by the intelligent staff the tire makers have assembled around them. Pneumatics hold the center of the stage when it comes to pleasure cars, and in commercial work it is the "solids" that are used, unless in a couple of isolated cases. The high-wheelers also use solids, and in such cases they are of small section, because the wheels afford much of the qualities that more properly reside in pneumatic tires.

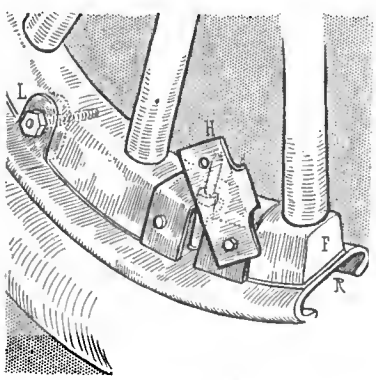
Shocs are made in diverse ways, plain, non-skid, thick and thin. Tubes are far more stable than they once were. Valves and other fittings are secure, and "demountable" rims are much in evidence. Spare wheels and extra rims are exploited, all with the idea of rendering touring more pleasant than it otherwise would be.

Tire inflating devices take on several forms, from tanks to power pumps, and it is now a very simple matter to inflate an unruly tire without soiling the hands or pumping until the complexion changes. It is now possible to issue rules telling how much pressure should reside in the tires, with the expectation that the rules will be followed. In the old days, the idea of pumping up a 36 by 5-inch tire to 100 pounds per square inch, with a bicycle pump, was as a mere joke. The hand pumps now to be had, of which excellent examples are to be seen at the show, certainly do approach near to perfection. Besides tires, pumps and suchlike, there are tire-chains, and non-skid covers in leather and other forms. Some of the covers are "studded."

Cape tops are so well represented as to make one wonder why, unless it is that these tops are of great utility. They come nearer rendering a touring car universal than any other plan possible to devise. A touring car fitted with a good cape-top, provided with curtains, fitted with a wind-shield, comes about as near being wind and weather-proof as anything can be; moreover, the cost is low, and the weight is not enough to take notice of, unless to note that it is far less than the weight of any other device that does the same work. A touring car, fitted with a good cape top, is quite as capable of protecting the occupants of the car, as the protection afforded by a limousine, at a far lower cost, and without the discomfort of being housed in on a fine day, when half the pleasure of touring would be lost were one to take the highway in a limousine. Even the runabout types are in vogue with tops, and they are rendered of double value thereby. Just as useful are the robes and all sorts of costumes, the use of which will require no time to describe. That the autoist is being looked after, however, is assured.

What follows is an incomplete summing up of the accessories division, taking the material which was most convenient and nearest at hand, but the subject will receive more thorough attention in the issue of a week hence. Therefore, those who search unsuccessfully may reasonably expect that attention will be called to their products in THE AUTOMOBILE of January 7.

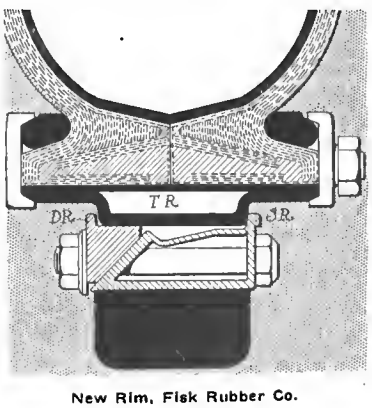
Demountable Rims and Tire Features.—This year will see a landslide to demountable rims, and it is safe to predict that within the coming 12 months many new concerns will spring up manufacturing these great time economizers and labor savers of road work.



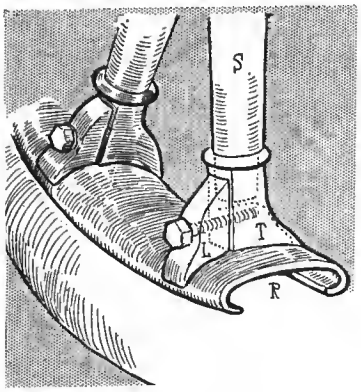
Diamond Demountable Rim.

The improved Diamond demountable rim consists of a rim *R* carrying the tire and which attaches to the felloe *F* by means of several lugs *L* on the rim, which sit in recesses in the side of the felloe, and the rim is anchored on by cross bolts through the felloe and lugs *L* so that removing the nuts on these bolts allows of pulling the rim and tire off at that side. An improvement in the rim is the discontinuance of the blind valve and cutting a slot in the side of the felloe for the valve stem. Where this is cut a supporting brace *H* is used to strengthen the felloe and is held in place by a couple of through bolts. In removing this rim the brace must be removed before the rim can be taken off. There are five lugs *L* on each rim, so that seven nuts have to be taken off in removing the rim.

The Fisk demountable rim, carrying the mechanically fastened Fisk clincher tire, consists of the tire rim *TR*, which, at the right side, rests on the stationary rim *SR*



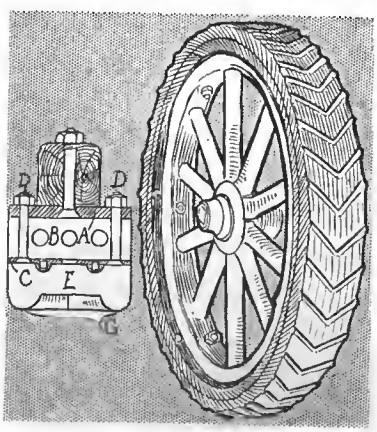
New Rim, Fisk Rubber Co.



Healy Demountable Rim.

and at the other side on an expanding split *V* ring *DR*, which as the nuts holding it in place are tightened, the ring tends to climb the inclined surface of the stationary rim *SR* and so binds the tire rim *TR* on. In this rim it is necessary to remove the nuts holding the expanding ring *DR* in place when the ring drops out and the rim *TR* with tire can be pulled off. In putting the new rim on this process is reversed. Provisions are made to prevent creeping of the rim *TR* through the wheel felloe. As the nuts on these bolts are tightened, the wedges entering between the stationary and demountable rims on one side bind the demountable one in place while a low flange on the opposite side of the stationary prevents slipping off of the demountable on that side.

The Healy Leather Tire Company uses a demountable in which there is no wheel felloe, and when the rim with the tire is off the ends of the spokes are bare. Each spoke carries on its outer end a tenon *T*, which is a steel casting, into which the end of the spoke fits. The outer end of this is curved to correspond with the back of the clincher rim *R*. Secured to each tenon is anchored lock *L* held by a galvanized steel bolt with a bronze nut. By loosening this bolt the locker *L* can be turned part around to allow the rim *R* to be pulled outward and off. In changing this rim there are as many nuts to loosen as the wheel has spokes.



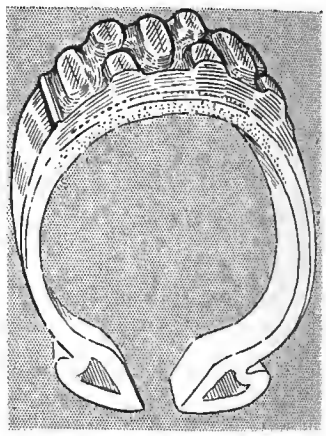
Snell's Solid Cushion Tire.

A new demountable is the Sager, the product of the J. H. Sager Company, Rochester, N. Y. It is designed on the Fisk principle with a removable beveled ring at one side that forces the demountable rim against a beveled flange on the opposite side of the wheel felloe. The beveled ring is held in place by a series of crossbolts in the felloe with hooked ends for resting against the beveled ring and nuts on the opposite ends. In removing this rim the nuts on the bolts are loosened so that the hooks may be turned toward the wheel hub, after which the beveled ring can be pulled off, followed by the tire. Each tire rim has riveted to its inner surface a metal strip with outwardly beveled edges, one of which bears against the beveled flange on the rim shrunk onto the felloe and the other against the anchoring ring.

A new idea is shown in Snell's resilient double-cushion tire, which is designed mainly to prevent skidding. A steel band 1-4 inch thick and 3 inches wide is bolted to the wooden felloe of the wheel. A 1-inch rubber cushion is mounted on this band and over this cushion are two other bands separated by about three-eighths of an inch. The rubber cushion is clamped between the upper and lower bands by bolts, which are free to slide through the lower band when the cushion is compressed. The cushioning effect is increased by the fact that there are in the rubber a number of holes which extend throughout its length. The non-skidding qualities are secured by means of ridges on the outer cushion of the rubber. These ridges, being V-shaped, which permits them to also serve as cleats and thus secure greater traction. As air can circulate between the ridges, it is claimed that this prevents raising as much dust as does an ordinary motor car wheel.

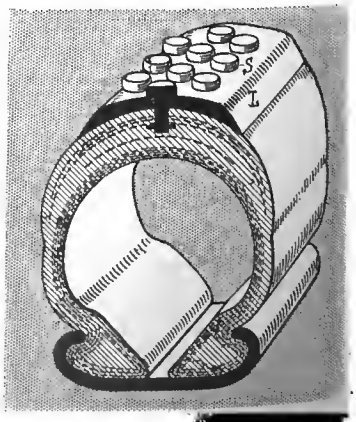
As a rival of demountable rims are the Stepney and Burrows spare rims. The Stepney consists of a clincher rim carrying an inflated tire which is attached to the clincher on the wheel rim by hooks which grip the wheel rim after the tire bead is thrust back. Several of these hooks are distributed regularly around the rim and each, when in position, is tightened, bringing the attached rim into rigid position. In addition to this, straps from the attached rims pass around spokes of the wheel, prevent any slipping of the Stepney. In the Burrowes spare wheel the same method of attachment is used.

The Republic Rubber Company shows a rubber tread round skid. The Republic line for the coming season consists of regular clinchers and also tires of the split-bead made to fit the quick detachables. A rubber tread non-skid tire is one of the features of the Republic Company's line. It is known as the Staggered tread tire, the projections on the tread being about 1-2 by 1 1-2 inches by about 3-16 inch high. They are a part of the main body of the tire and being thus incorporated, they help to eliminate the possibility of the tread loosening from the carcass of the tire.

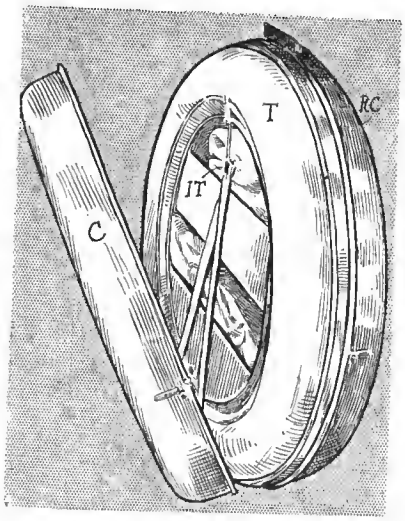


Republic Co. Staggered Tread.

The construction of the Pennsylvania wrapped tread tire is practically unchanged over that of the past season except that a slight variation has been made in the composition used for the tread, which is designed to give longer life to the tire. The company shows a steel-studded non-skid type of tire, the durability of which is increased by the use of harder studs than it was formerly possible to obtain. These are case-hardened by a special process which hardens them practically to the center of the head. They are set in a strip of specially prepared leather on the tread *L*, which encircles the tire and holds them firmly against being pulled out or broken. The company also has a special tire of particularly high-grade manufacture, and in which there is considerable hand work. It has a white cover of extremely tough rub-



Pennsylvania

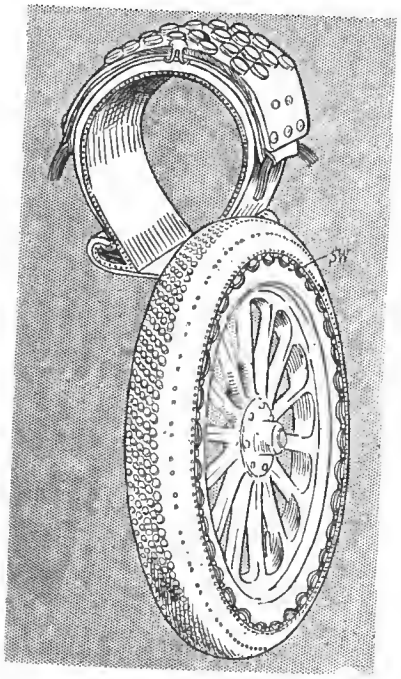


Merchant & Evans Tire Case.

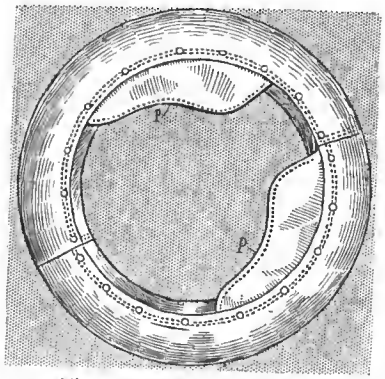
ber and the fabric throughout is of Egyptian cotton with pure Para rubber friction.

The feature of the exhibit of the Merchant & Evans Company is new. As will be seen by the illustration, the metal casing is divided into two sections, *RC* being the rear part and *C* the cover. *T* is the outer casing, while *IT* shows the inner tubes snugly tucked away in the space inside the outer casing. The casing is fastened at the sides by catches and is locked at the top, which makes it proof against theft.

The Zeglen Bullet Proof Cloth Company has utilized its cloth in the construction of the pneumatic tire which is shown by this concern. The company has just started the manufacture of these pneumatics, and expects to have them on the market in another month. The inventor claims that he uses rubber only to secure resiliency and provide a good wearing surface. He uses his bullet-proof cloth for the fabric, the cloth being of silk and of eight strands in thickness. It is interwoven into one solid piece, and the claim is made that when it is vulcanized together with the outer rubber the fabric has more resiliency than the cotton and rubber combination. As an example of its puncture-proof features, the inventor cites an instance where a car fitted with these tires was driven seven times over a plank through which 28 sharp-pointed spikes had been driven. The test showed the outer rubber covering to have been badly lacerated by the spikes, but the inner tubing, composed of his cloth, was not penetrated, he claims.



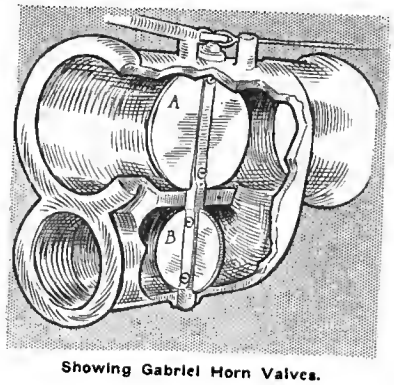
Leather Tire Goods Co. Tread.



Allen Specialty Co. Rim Case.

Transmission Parts.—The Merchant & Evans Company, Philadelphia, continues its rear axle with which is incorporated a three-speed gear-set with direct drive on both high and second speeds. In this axle there are two bevels on the differential constantly in mesh with two pinions on the gear-set mainshaft and between which pinions is a clutch for anchoring either pinion to the mainshaft. This company also has a rear axle gear-set in connection with a solid forged stationary axle, which is centrally dropped, forming a bed into which the housing for the gear-set and differential are anchored.

The Timken Roller Bearing Axle Company, Canton, O., is introducing its new back axle, which is of the floating construction and consists of a one-piece steel casing extending from one rear wheel to the other and with a central expansion for containing the differential. It is without truss rod. All adjustments for the bearings can be accomplished from the outside of the case. The steel casing gradually increases in strength toward the center and sudden variations in thickness are avoided. Internal and external brakes are fitted, the spring seatings are swivelled, and a swivelled V-torsion rod is used which spans the differential.

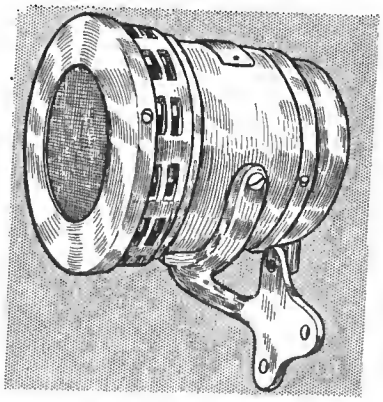


Showing Gabriel Horn Valves.

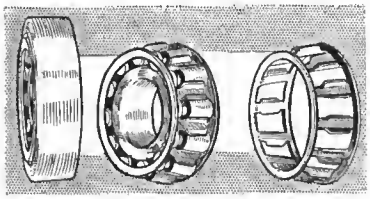
The Standard Roller Bearing Company, Philadelphia, continues its line of front and rear axles, the rear ones being of two types, one of the straight floating construction of the design used on Chalmers-Detroit cars and the other the combined rear axle and gear-set as used on Pennsylvania and Thomas cars.

Ideas in Horns.—Improvements over old models will be noted in the Gabriel Horn Manufacturing Company product, the feature of which the company is most proud being the valve that operates this exhaust horn. This valve is designed to prevent sticking, for as soon as the valve *A* in the main channel begins to close and the disk *B* in the branch channel, placed at an angle of 90 degrees, starts to open, it permits the exhaust immediately to escape, whereupon the horn responds and prevents the building up of back pressure. A cut-out is had by removing the circular disk *A* in the main channel, which gives an escape of 1 1-4 inches and relieves the back pressure caused by the muffler.

The Sireno, of the Sireno Company, is an electric siren with all rotating parts equipped with adjustable ball bearings. There is a field magnet cast of one piece of special metal, the coils are form wound, the armature is of the iron-clad drum type



The Sireno Horn.



Timken New Short Bearing.

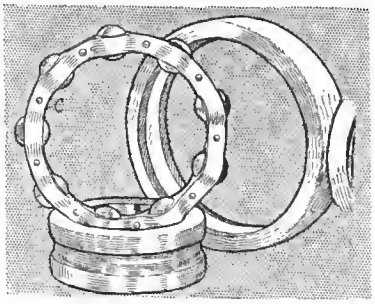
built up with steel laminations, the commutator is of hard-drawn copper insulated with sheet mica, while the turbine is of cast aluminum alloy, machined and keyed to an electric motor shaft. Operating the Sireno is by the pressure of a button on the steering wheel, on the floor, or at the side of the car or wherever the owner may wish to place it. The electric current may be had from the car's storage battery, which will not interfere with the battery doing its duty otherwise. The Sireno operates normally at from six to eight volts, but a louder tone and greater carrying power may be had by increasing the voltage. The principle involved is that of air currents generated by the rapidly revolving turbine driven by the electric motor. The air is drawn through the funnel of the siren and forced out through the peripheral openings on the principle of centrifugal force. There will be several other models, one of which is for touring cars, while there is a smaller type, called the Junior, which has a range of from one to two miles on country roads. Both of these will work from the ordinary six-volt battery.

Bearings.—Improvements noted in ball bearings for 1909 consist in several cases in increasing the number of balls in a given size of bearing, as compared with the number used this year; and the use of metal separators between the balls forming a separate cage for each ball. In roller bearings, one of the noted advances is the manufacture of the short-length bearing which occupies the same space at the annular ball type.

The New Departure Manufacturing Company in its double ball-race bearing uses an inner ring *A* with two ball grooves *V*, in which are races of balls separated by the ring spacer *S* made in V-form, with holes in either side forming ball cages, the balls in one race alternating with those in the other. The outer race is a three-part one of two cup pieces *B*, one for each ball race, and a cover *C* spanning the tops of the pieces *B* and holding them together. Ten balls are carried in each race. In its exhibit booth the company will demonstrate the dual work these bearings perform by being capable of carrying loads at various angles with 1,000-pound flywheels. In this work the bearings will be forced to carry the load at every angle from radial to absolute thrust. On exhibition will also be a transmission set which has seen 16,000 miles of road service.

Hess-Bright bearings for 1909 are in two styles, the new one brought out this year with each ball in a cage of its own, and the old style with spring separators between the balls. In the new cage type the separator is made in halves, one half entering between the balls at one side of the bearing and the other set at the other side, the halves then being secured together. The new magneto bearing has a one-piece inner race, but a two-part outer race. The products of this company are so well and favorably known as not to require description, especially if it is remembered that the H-B, D.W.F., were the first of the annular ball bearings to be used in automobiles, that is to say, annular ball bearings with a fixed adjustment.

The Standard Roller Bearing Company in its annular ball bearing employs one-piece inner and outer races and carries the nine balls in a spacer *C*, which is made in halves riveted together, the halves having semi-circular curved parts for the balls.



Standard Roller Bearing Co. Bearing.

Standard alloy tool steel is used in the balls. The company continues its full type of annular ball bearing in which the balls are introduced through a recess in the outer race. Its line includes the improved Grant conical roller bearing with solid rollers supported in end carriers with individual sockets for the ends of the rollers and which ends are riveted together forming a cage for the rollers. The cone has a wide shoulder against which one end of the roller carrier has a bearing, which shoulder has the same degree of bevel as the ends of the rollers.

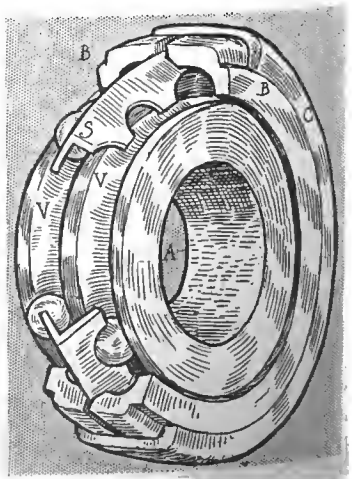
Most interesting in the line of Timken roller bearings is the short-length bearing, which is made so that it is interchangeable with the different makes of annular ball bearings and can be fitted where they can. Its design is the same as the present Timken bearing with the rollers carried in separate cages in a one-piece metal stamping.

J. S. Bretz, exhibitor of the F. & S. annular ball bearing, shows the new type, which differs from the previous one in the employment of a die-cast separator for the balls by means of which it is possible to get many more balls into a bearing, which has been one of the aims of makers of annular ball bearings. Each ball has a separate cage.

Windshields.—Windshield trend for 1909 is toward small brass frames, folding types without cross-frame pieces between the upper and lower halves of the glass where it obstructs the driver's vision, and upper halves capable of being set at any angle and of being replaced by a wire mesh insect screen for the catching of flies and insects in warm weather, when the glass protection is not needed.

Colonel Sprague, of the Sprague Umbrella Company, has ready a new No. 90 folding windshield which is an advance of previous ones of this type in that when folded the narrow central dividend strips are at the top and do not interfere with the vision. To do this the upper half is upside down when folded behind the lower half. The upper half folds through the usual brackets, which are offset to miss the adjusting nuts. This shield is made with a solid brass molding for a frame. The No. 70 shield does not invert the top half when folding and so the heavy part of the frame is across where the center of the shield when up would be. The No. 42 shield, with wood frame and hinged top half, is continued.

The No. 3 divided folding shield of the Troy Carriage & Sun Shade Company, Fig. 1, has, in brief, two upper halves, one an insect screen, *A*, and the other a glass part, *B*, each hinged at the center of its ends to a cross beam which at its center hinges to the top of the framework of the bottom half of the shield so that when the insect screen is up, the glass can be down and vice versa. On the center of the end frame of the lower half are two curved hooks for holding the insect screen or the upper glass alongside of the lower half; or, if desired, the one part can be anchored up and the other left down. This concern has a rain vision attachment for its No. 2 shield which enables the driver to see ahead in rain storms. In addition are types of folding shields with



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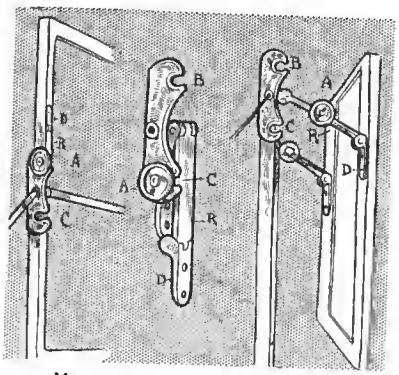
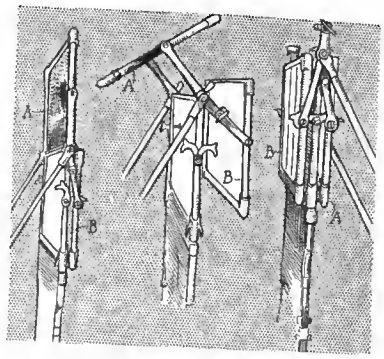


Vanguard Mfg. Co. Windshield.

brass and wood frames and folding from a hinge or long center arm.

The Vanguard Manufacturing Company has in its new folding windshield an example of the shield free from the cross-bar between the glass halves. The upper half hinges by a long bar *R* at each end to the lower half. Attached to the top of the lower half at each end is a bow-shaped piece with slots *B* and *C*. On the hinge rod *R* is a finger nut *A*, whose stem, when the windshield is up, enters the upper slot *B*, and with the top half folded beside the lower half enters the slot *C*. Once it is in either of these slots, tightening the nut locks it firmly in place.



Troy Sunshade-Carriage Co. Shield.

UP-TO-DATE ROLL CALL OF THE A. M. C. M. A.

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Reo Motor Car Co.,	Lansing, Mich.,	Reo
Simplex Motor Car Co.,	Mishawaka, Ind.,	American Simplex
St. Louis Car Co. (Auto Dt.),	St. Louis, Mo.,	American Mora
Welch Motor Car Co.	Pontiac, Mich.,	Welch
York Motor Car Co.,	York, Pa.,	Pullman

List of Standing A. M. C. M. A. Committees.

SHOW COMMITTEE.

H. O. Smith, Chairman.....Premier Mfg. Co
S. H. Mora.....Mora Motor Car Co.
R. M. Owen.....Reo Motor Car Co.

TOURS & RACES.

W. C. Marmon, Chairman.....Nordyke & Marmon Co.
A. C. Newby.....National Motor Vehicle Co.
H. O. Smith.....Premier Motor Mfg. Co.

GOOD ROADS.

Charles E. Lewis, Chairman.....Jackson Automobile Co.
James Couzens.....Ford Motor Co.
R. E. Olds.....Reo Motor Car Co.
H. B. Krenning.....Dorris Motor Car Co.

LEGISLATION.

R. E. Olds, Chairman.....Reo Motor Car Co.
C. G. Stoddard.....Dayton Motor Car Co.
A. C. Newby.....National Motor Vehicle Co.
R. A. Palmer.....Cartercar Co.
R. E. Graham.....Acme Motor Car Co.

MEMBERSHIP.

W. H. VanDervoort, Chairman.....Moline Automobile Co.
Morris Grabowsky.....Rapid Motor Vehicle Co.
S. H. Mora.....Mora Motor Car Co.

ADVERTISING AND PUBLICITY.

J. N. Willys, Chairman.....Overland Automobile Co.
G. B. Louderback.....Buckeye Mfg. Co.
L. M. Bradley.....New York Office, Manager.
Chas. E. Duryea.....New York Office

FINANCE.

Jamea Couzens, Chairman.....Ford Motor Co.
W. G. Morse.....Atlas Motor Car Co.
J. B. Bartholomew.....The Bartholomew Co.

STANDARDIZATION & TECHNICAL.

John D. Maxwell, Chairman.....Maxwell-Briscoe Motor Co.
Henry Ford.....Ford Motor Co.
R. E. Olds.....Reo Motor Car Co.

FREIGHT & TRANSPORTATION.

Harry Knox, Chairman.....Atlas Motor Car Co.
H. W. Mack.....Mack Bros. Motor Car Co.
R. Harry Croninger.....Pennsylvania Auto-Motor Co.
J. N. Willys.....Overland Automobile Co.
C. C. Hanch.....Nordyke & Marmon Co.

TIRES.

G. V. Rogers, Chairman.....Mitchell Motor Car Co.
James Couzens.....Ford Motor Co.
Frank Briscoe.....Brush Runabout Co.
O. Stevenson.....York Motor Car Co.

AGENCIES.

W. H. VanDervoort, Chairman.....Moline Automobile Co.
A. R. Welch.....Welch Motor Car Co.
H. R. Mallow.....DeLuxe Motor Car Co.
Frank L. Pierce.....Gaeth Automobile Co.
H. B. Larzelere.....Chadwick Engineering Works.

SOME OF THE GOSSIP OF THE PALACE SHOW

Premier Centuryite at Show.—The famous Premier Century car is at the Palace show, whither it came after a very strenuous journey from the factory in Indianapolis. This trip was made by a roundabout route which necessitated crossing the Blue Ridge and Allegheny mountains. This run of 1,805 miles from Indianapolis to New York, including stops, was made in 84 hours of actual running time, a large portion of which was made by night. The route lay via Dayton, Columbus, Cleveland, Pittsburg, Hagerstown, Washington, Baltimore, Wilmington and Philadelphia. The speedometer now registers 15,799.7, which is the total of the Premier Century in seventeen States. The ignition is announced to have been perfect during the entire grind, and the original set of igniters is still as good as new. Even the platinum points show no wear at all, and measure up perfectly with new sets. The igniters have only required slight cleaning, without adjustments, every 2,500 miles.

Velie Manager at Hotel Astor.—H. G. Moore, manager of the Chicago branch of the Velie Motor Vehicle Company, of Moline, Ill., is at the Hotel Astor, for the week of the Palace show, for the purpose of negotiating with Eastern dealers for agency contracts of the Velie cars during 1909. Mr. Moore recently severed his connection with the McDuffee Automobile Company, of which he was secretary, and established a branch house for the Velie company at 1615-17 Michigan avenue. The building now occupied by the Packard agency has been leased, the latter interests intending to move in the Spring. In addition to managing the Chicago branch, Mr. Moore will have supervision of the Velie agency department east of Chicago. The Velie Company is an old firm in the manufacture of implements and vehicles, and, in addition to the business managed by Mr. Moore, its product will be handled in the West by the John Deere Plow Company, of Omaha and Kansas City, and the Deere & Weber Company, of Minneapolis, these firms acting as wholesale distributers.

Continental Tire Contest.—In order to demonstrate the advantages to be obtained by equipping a car with Continental tires and the Continental demountable rims, the Continental Caoutchouc Company offers a prize of $5, to be awarded each day of the show, to the owner, driver, or prospective owner of a car making the best time in changing tires with the Continental demountable rims, while at the end of the week a prize of $20 will be awarded to the person having made the best record throughout the course of the show. All official records will be carefully tabulated and the books kept open for examination at all times. Those unfamiliar with the advantages of Continental tires and rims are particularly invited to call at space 170 and watch the demonstrations. They will be allowed two trials in the contest.

Splitdorf Fiftieth Anniversary.—There are probably few exhibitors in the entire Palace show, in whatever line of manufacture, who can look back upon half a century in business. This is the proud record of the Splitdorf Laboratory, the fiftieth anniversary of which was celebrated just prior to the opening of the show. The business was established by Henry Splitdorf in Philadelphia in 1858 as a laboratory for those desiring to experiment with electricity. During the Civil War it was the only plant in the country engaged in the manufacture of electrical detonators, and accordingly prospered. On the occasion of the birth of the present owner, the business was removed to Center street, New York, later going to Vandewater street, in 1888, when Charles Splitdorf assumed control. Last year the business, having entirely outgrown its downtown quarters, was removed to a modern factory building of its own on Walton avenue, the Bronx.

Rapid Truck's Long Trip.—Not to be outdone by the pleasure vehicles, the commercial cars have at least one representative which came to the show under its own power. This is a truck made by the Rapid Motor Vehicle Company, of Pontiac, Mich. Leaving the factory December 20, this one-ton machine, which is the same one that went through the Glidden tour, came by the long Northern route, through Toledo, Cleveland, Erie, Buffalo, Rochester, Syracuse and Albany, and, as was the case during the tour last Summer, the truck was loaded with Goodyear air bottles. After completing the Glidden, the truck was dismounted and its parts calipered, but investigation showed the wear to be hardly noticeable. Since that time it has received no attention, its mileage up to date being 2,021 miles, plus the distance to New York.

A Good Press Agent Is a Good Asset.—Effectively distributing and also getting into print the publicity concerning an automobile show is an art, and, judging from the generous amount of material printed in the daily papers, "Dunc" Curry made a successful job of it this year. While "Dunc" occasionally takes a little exercise in hammer-throwing, his work juggling is always well done, and consequently read even by those who do not always agree with him.

Two Showing Exhibitors Who Are Not in the Show.—Following its usual custom, T. B. Jeffery & Company, makers of the Rambler, are doing their exhibiting in plenteous fashion at their New York salesrooms, 38 West Sixty-second street, where Homan & Schultz have a full line on view. In similar manner the American Locomotive Company is exhibiting the "Alco," formerly known as the Berliet, at the Waldorf-Astoria.

Second A. M. C. M. A. Show Issue, January 6.—In the issue of January 6 THE AUTOMOBILE will give thorough attention to the accessories exhibited in the Grand Central Palace show, covering the things that are new or have demonstrated value to users and builders of automobiles.

Smoker at the A. C. A.—Invitations have been issued by the Automobile Club of America to the trade and visiting automobilists for a smoker which will be held at the clubhouse, in Fifty-fourth street, west of Broadway, Saturday evening. Orrell A. Parker, chairman of the entertainment committee, has prepared an attractive program, and at the conclusion of the entertainment refreshments will be served.

Belated Exhibitors.—Early in the proceedings it was a little difficult to induce some of the exhibitors to come forward and take space; they were waiting for indications of the trend of events. Most of the belated ones took the best space they could get at the last moment, but a few of them failed to get any space at all, although it is true they would have been willing to take the standing room that is reserved for the patrons of the industry.

PARIS, Dec. 25.—Problematical as the aeronautic situation may seem to the novice, it is a fact that the participants in events that of late have astounded the world are in dead earnest, and the first exhibition is therefore worthy of full notice. The salon opened on the day after Christmas, under the most happy auspices, with an attendance which can only be described as "sardinistic." Strange to relate, in spite of the activities in the aeronautic zone that centers around Paris, but a small part of the vast population were previously enabled to observe the doings, and they flocked to the salon as if they feared the passing of the last chance. Our own Wilbur Wright and his doings in the aeronautic line are now regarded as only to be equaled, and seeing the aeroplane is next to seeing him. Wright himself was not present at the opening.

President Fallières informally opened the exhibit at one o'clock Thursday afternoon, but he was followed and preceded by such a large crowd that it is hardly possible that he had a chance to see much, and if he wants to study aeroplanes he will have to go later, during the salon's last days.

One large dirigible balloon, suspended high overhead, runs across the entire breadth of the Grand Palais, but most of the airships, huge, bird-like affairs, rather awkward when seen so close, are on the ground, where they may be carefully studied.

Unfortunately, the Wilbur Wright aeroplane was not in position when the exhibition opened. But Hart O. Berg worked away all day, and on the second day of the exhibition it was ready to be seen. In spite of the fact that nothing but the motor was visible of the Wright aeroplane during the greater part of Thursday, it was impossible to get a glimpse of the stand without waiting several minutes, the crowd was so great.

The Blériot exhibit is very popular. This inventor showed his biplane and his new models of monoplanes, as yet untried, with which he hopes to do great things. The features of the new Blériot biplane are highly interesting. The machine's supporting surface is 65 square yards, to which must be added 6 square yards of balancing wings. The motor is a 40-horsepower Antoinette engine, driving by chain transmission, with a four-bladed Vickery propeller, giving 480 revolutions. Two rear auxiliary planes, having a total surface of 24 square feet, are placed on each side of the steering apparatus, which is a striking novelty and will create a great sensation, being placed in front. The machine is directed by means of a single lever. The rise and fall are managed by means of the front runner, made out of lateral inside planes.

Another exhibit is the Delagrange machine, better known to the public than most others, and yet it has attracted great interest, and a crowd has also hovered about Henry Farman's stand. The Breguet gyroplane of the same type as the one which was tried with little success last Summer near Douai is also here.

Another important exhibit is that of the Esnault. Successful flights were made near Versailles by this inventor. It will be remembered that the chief feature of this machine, which is of the single-plane type, is its extreme lightness, the body being of aluminum and wood, covered with thin gutta percha cloth. The 25-horsepower five-cylinder motor and the four-bladed propeller are in front of the aviator's seat, being placed in the main body of the aeroplane.

One of the most interesting exhibits is that of M. Ader's "Avion," which has been brought from its place in a museum. This ancestor of the modern aeroplane was invented fifteen years ago, but at that time the military authorities laughed at Ader, although he succeeded in flying some distance. Utterly discouraged, Ader destroyed all his papers. The subsequent successful aeroplanes have proved, however, the correctness of his theories.

First Aeronautical Port and Aerodrome.

PARIS, Dec. 24.—Ten miles to the south of Paris, on the outskirts of the little town of Juvisy, is the first aeronautical port and aerodrome ever constructed. The perfectly flat field, over 250 acres in area, has a circular track of about two miles, a straightaway of one mile and surrounding it sheds for aeroplanes and dirigible balloons, workshops and garages, coal and hydrogen gas plants, observation towers, grandstands and postal and telegraph offices. The aerodrome, being on a vast plain within easy distance of the French capital, will doubtless serve as a landing place for airships and aeroplanes traveling from the provinces to Paris. The ground is specially prepared for the testing of new aeroplanes and the tuning up of machines, which will later take longer flights over the plains stretching for miles in all directions. The opening ceremony of the aerodrome, to be attended by a deputation from the Senate, has been fixed for Sunday, January 10.

Blériot's Four-Passenger Flyer.

PARIS, Dec. 24.—Louis Blériot, apostle of the monoplane type of flying machine, has turned to Wright models for the four-passenger flyer that is now nearing completion in his private workshops. The main bearing surfaces are exactly the same length and have the same curve as those on the American's machine, the only difference being a slight increase in depth from front to rear. The position of the engine and of the two seats is also identical with that of the aeroplane from Dayton. Instead of two separate propellers, however, there is only one, with four blades, driven, as in the case of the Wright machine, by means of a chain. Here the similarity ceases, for, instead of the two elevation planes at the front and the lateral rudder at the rear, Blériot has adopted the contrary disposition, the steering being done by three lateral planes carried in front and pivoting together. Change of altitude is obtained by means of small rear supplementary wings, pivoting at the end of what may be regarded as jibs carried at each extremity of the main bearing surfaces.

The apparatus which at first sight so closely resembles that of the American champion is full of differences on closer examination. In the first place, the workmanship, instead of being crude and amateurish, as on the successful American aeroplane, is of the very highest throughout. The power plant is an eight-cylinder Antoinette water-cooled engine, developing 50 horsepower and driving the propeller at 480 revolutions a minute. The two front seats are placed in the same position as those on the Wright flyer, but, instead of being rough boards covered with rougher sacking, they are comfortable cane-bottom office chairs with the legs cut off. Immediately behind them are two more seats to be

occupied by passengers. The radiator is an ingenious arrangement, carried to the left and right of the pilot between two of the uprights. It really consists of a mass of hollow aluminum rings attached to the canvas vertical division, and united one to the other by means of short lengths of rubber tube, the top and bottom rows each being united to a collector.

The aeroplane is mounted on small wire wheels fitted with very large section pneumatic tires. Hydraulic shock absorbers are also employed for the front suspension. Instead of the two wooden levers that Wright has made familiar, the forward rudder is operated by means of a vertical column and automobile wheel, a lever, similar to that on Pierce cars, being carried underneath for the control of the rear elevation planes. Instead of plain linen roughly tacked or sewn in position, the main bearing surfaces are covered with fine rubbered cloth, as used for balloons. Louis Blériot promises to be out shortly with his new apparatus and to carry all the passengers for whom he has provided seats.

Rules for Europe's First Aeroplane Races.

PARIS, Dec. 24.—Regulations are now out for the Monaco aeroplane races, the first of their kind to be held, and which have been scheduled for January 24 to March 24 in the Bay of Monaco. Any type of machine heavier-than-air is admitted, provided it carry with it its own source of power. Three flights must be made over the official course on three different days, the aeroplanes starting from the port of Monaco without touching the sea wall, flying across the bay, and rounding a red and white flag which will be placed at the extremity of Cape Martin, a return being made to the starting point. The time will be taken as the flying machine crosses over the sea wall on the outgoing and return trip. Total distance in a straight line is 5.9 miles.

There are no restrictions on the methods of starting, or on the place from which the machine shall leave the ground, the official start being considered when the aeroplane crosses over the sea wall. After crossing over the finishing line the flying machines may come back to earth in any way desired and at any place that may be most convenient. A suitable type of float, capable of bearing the apparatus on the surface of the water in case of accident, will be insisted upon, the efficiency of the apparatus to be judged by the committee. Only pilots who have already given proof of their ability to handle an aeroplane shall be allowed to take part in the race, the committee to be sole judge of ability. If the pilot of the machine is not able to swim, the organizers shall have power to insist on the wearing of a life belt.

Attempts may be made on any day from January 24 to March 24 between the hours of 10 a. m. and 5 p. m., on condition that the committee has been informed not later than 9 o'clock of the same day of the intention to fly. The number of attempts are unlimited, the three fastest on different days being additioned to give a basis of classification.

Prizes are $15,000 in cash for the first, $3,000 for the second, and $2,000 for the third, the committee having the right, in case of a very small number of entries or indifferent performances, to change the prize list as they may think suitable. Entries are received until March 1, at midnight, at the International Sporting Club of Monaco, the fee being $20 per entry.

If dimensions of the apparatus are given when the entry is made, the committee will undertake to erect sheds on the shore to house the flying machines, responsibility for accident being with the owner of the apparatus. Any shed abandoned for twenty-four hours will become the property of the committee, which may dispose of it as it thinks fit. Protests will only be received when accompanied with a fee of $20, and must be handed in the same day within one hour of the close of the day's racing.

Althougb it is not yet known what machines will take part in the competition, it is believed, from the number available, that the entry list will be a satisfactory one. Wilbur Wright having taken up his winter quarters at Pau, and his brother being expected in Europe very shortly, it is believed that both will take part in the Monaco races. Farman and Delagrange are certain starters; others having machines suitable for this contest are Santos-Dumont; Antoinette Company, with several different types of aeroplanes; Voisin Frères, with several machines; Comte de Lambert, Paul Tissandier, and others having bought Wright aeroplanes; Louis Blériot, with both monoplane and biplane flyers; Robert Esnault-Pelterie, with monoplane machines; Moore Brabazon, with a Voisin Frères biplane; Captaine Ferber, on an Antoinette machine; Bayard-Clement Automobile Company, with a biplane driven by a new type of seven-cylinder gasoline engine; Melvin Vaniman, with triplane machines, and Goupy, also with a triplane. The distinct favorites are Wright, Farman, and Delagrange, among whom the contest is likely to be keenly disputed.

QUESTION OF 1909 SALON SOMEWHAT COMPLICATED

PARIS, Dec. 24.—"There will be an automobile Salon in Paris in 1909," declares the committee of the Automobile Club of France. "If there is, we will not take any part in it," declare a group of the most important constructors of this country. Between the two the outlook for the continuance of the annual exhibition in the Grand Palais on the Champs-Elysees is not very promising, for the firms having signed an agreement not to exhibit at any show next year, comprise Renault, Panhard, Brasier, Delaunay-Belleville, Dietrich, Berliet, Mercedes, Germain, Isotta-Fraschini, Bollee, Minerva, Pipe and Darracq. If they remain true to their agreement—and the penalty for breaking away is $10,000—the annual show will next year be either a failure or a second rate affair.

When the matter came before the committee of the French Club last week, there were two parties; the one representing a group of French constructors moved that in the interest of both users and constructors of cars there should be no exhibition next year in Paris or surrounding district, and that in future shows should be held every two years. The opposing party, led by the Marquis de Dion, maintained that the best interests of the industry would be served by holding the show as usual. It was this proposition that was carried by 34 votes to 18, the majority comprising a small number of big constructors and a large number of persons who are but private users of cars. As the minority is more representative of the Frencb industry than the majority, the vote in favor of a continuance of the show is not looked upon as very important.

There is, however, a possibility of the anti-show men shifting their position when it is discovered that London has no intention, either of alternating with Paris or holding a show every two years on same dates. This was foreseen in the proposition of the minority, who put in a clause to the effect that if the show were held it should be of an economical and co-operative nature.

The Automobile Club of France, receiving considerable financial benefit from its annual exhibition, will naturally do its best to maintain it, and will probably succeed by offering to hold the next show on economically commercial lines to suit tbe dissatisfied constructors. So long as it is shown that the exhibition can be a source of profit and not of loss to the exhibitors, French constructors will be willing to come into it. Up to the present it is the club that has taken the plums, the advantage to constructors becoming less and less as the automobile has secured its position as an article of necessity.

In all probability 1908 will be the last of the fancy spectacular shows, and 1909 and succeeding years will see an exhibition in the Palais designed solely for the selling of automobiles.

The Formation of Gasoline-Air Mixtures

By P. J. Tice

BEFORE entering into discussion it should be here stated that wherever mention is made of the proportions of a mixture refcrence is made to the ratio by weight. Volumetric relations in such considerations are confusing and tend toward misleading deductions. Chemical reactions involve a definite weight relationship between the active substances. Combustion is a chemical reaction, and, as such, requires just so many pounds of oxygen for the complete reduction of a certain number of pounds of a given fuel. The weights of the substances can bear but one ratio to each other; while the volumetric ratio of combination may vary almost infinitely, because the factors of temperature and pressure must then be dealt with.

If the maximum temperature of combustion and its maximum pressure are to be utilized in an engine cylinder, its structure must be such that the molecules of the combining substances are in their proper positions relative to each other, *i.e.*, each molecule of fuel closely surrounded by the correct number of oxygen molecules before the occurrence of the ignition spark. This calls for the finest possible division of the fuel and its most thorough mixing with the air.

The Real Carbureter.

The accepted type of carbureter, taken together with its distributing manifold, forms a surface carbureter usually of quite small surface. The manifold walls form the real carbureter, and the device called the carbureter furnishes the fuel to that surface, from which any proper vapor that may exist in the final mixture is carried by the passing mixture of air.

By "typical carbureter" is meant a device in which liquid fuel is brought into contact with a moving column of air by the same pressure depression which causes the air to flow, *i.e.*, it is drawn through a passage by the motor suction simultaneously with the influx of the air with which it mixes to form the explosive mixture.

In the "typical" device, fuel is carried by flowing air from the open end of a passage located in a region of pressure lower than that of the atmosphere to which the other end is open. Lowered pressure without a correspondingly lowered temperature tends to cause vaporization. It is undoubtedly true that vaporization starts at this point as soon as the fuel has fairly left the nozzle. The intensity of this action depends upon the extent to which the pressure is lowered. The pressure reduction about the nozzle may be taken at .5 pounds per square inch, which value increases through the manifold to the valves until it reaches a value of 6 to 8 pounds with some six-cylinder engines.

Under carbureter conditions it is impossible to measure or even approximately estimate the extent of the vaporization, at the nozzle or through the manifold, due to this pressure reduction; but it is known to be very appreciable in its effect. It should be considered as a condition affecting vaporization, at the nozzle end but slightly, but to a much greater extent after the fuel has become suspended in the air.

Distinction in Vaporization.

Vaporization due to pressure reduction is distinguished from vaporization caused by the supplying of heat. In the former action, vaporization can become only partially complete, however far the process of reduction is carried, since the part of the liquid which vaporizes does so through the abstraction of heat from the remainder, which becomes constantly colder, until finally the temperature of the liquid is so low that vaporization ceases until heat is supplied from some outside source. Where vaporization is brought about entirely by heat from some outside source the degree to which it may be carried depends wholly upon the amount of heat supplied, since the temperature of the liquid is being constantly raised to or maintained at the proper point.

In the carbureting device under consideration neither of the above processes is carried to the limit, nor goes forward alone and unmodified. They are called into action simultaneously. The reduced pressure due to motor suction causes vaporization with a lowering of the temperature, and the heat of the air tends to cause vaporization through a transfer of heat from itself to the liquid. Thus it appears that each of these vaporizing actions assists the other—the air supplying heat to the liquid as it is cooled by vaporization under reduced pressure, and the reduction in temperature due to pressure reduction facilitating the transfer of heat from the air to the liquid.

Within the temperature and pressure ranges available, the liquid must present, relatively, an enormous surface to the air if vaporization is to be sufficiently rapid. To this end the passage through which the liquid flows is so formed that the liquid is broken up into a spray by the velocity of its efluxion due to the difference between the pressures existing at the two ends of the passage.

In any one carbureter the perfection of vaporization is proportioned to the fineness with which the liquid is broken up at the nozzle. The shortness of the time within which vaporization must be completed is what causes the above factor of fineness of division to enter. Since the heat transfer between the air and the liquid, or the passage walls and the liquid, is affected chiefly through the agencies of convection and conduction—the former implying a rapid agitation and relative motion between the particles of the two substances, and the latter the exposure by the liquid of the greatest possible surface areas—it is readily seen that the finer the fuel division at the nozzle the more rapid and complete will be the vaporization and the greater the homogeneity of the final mixture.

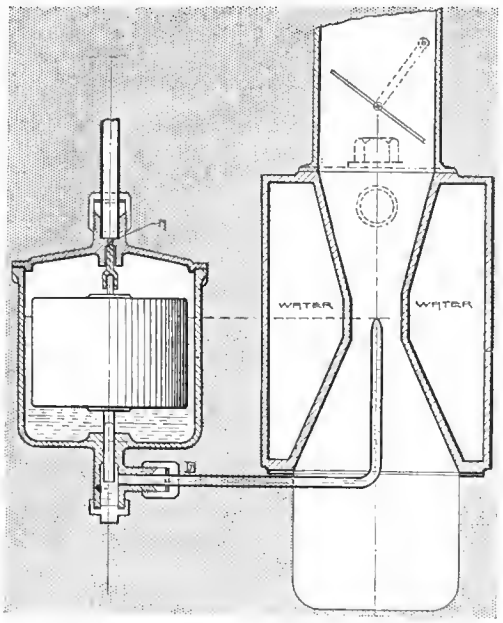
Fuel Division Usually too Coarse.

In the coarseness of the fuel division lies the chief failures of the typical carbureter. This has been proven again and again by any number of experimenters. Those who have constructed transparent mixing chambers for the observance of nozzle action have invariably found that the fuel left the nozzles as a solid stream or in heavy globules and irregular "chunks," not as a fine spray or mist, as it is supposed to do. Improved design and workmanship on the nozzle and needle valve parts will almost entirely overcome this poor action, with an increase in power output and fuel economy; but any nozzle form used will give a wet and sloppy discharge with low engine demands, even though a true spray may be delivered with increased demands.

Whatever form is given the nozzle, the effectiveness with which it can break up the fuel varies as the difference between the pressures at its two ends, and, as this pressure dif-

ference varies throughout the speed range of the engine, the fineness will also vary. At high engine demands the spray will be better and finer than at low; but this is absolutely necessary, since the time allowance for vaporization is less and the quantity of mixture formed is greater.

The nozzle of average performance will, at medium engine demands, deliver a thin conical sheet of liquid. This liquid



Characteristic Type of Float Feed Carbureter.

cone is torn away at its edge and carried on by the air column. Some of the fuel torn away is in small enough particles to be considered as spray or mist, and may be taken as contributing directly to the vapor content of the mixture; but the greater part sooner or later strikes some part of the containing walls, from which it is later picked up in the form of globules. These globules are continually picked up and thrown out by the air stream in its progress to the cylinders, until some of them are sufficiently small to become permanently entrained or have been completely vaporized.

Bends in the manifold passages aggravate the expulsion of the liquid globules, but they also permit of fuel once thrown out being readily picked up again. The persistence of rectilinear motion comes into play and throws out the heavier globules at the turns, they being again picked up by a following portion of the air column. This action is repeated at each.

In the foregoing it may seem that the vaporization accomplished by pressure reduction has been placed on a par with that brought about by the heat supply available in the air and passage walls. It is not meant that such an impression be taken. The rate of transfer of heat from the air and walls to the liquid will, of course, be higher the greater the temperature difference; the lowering of the pressure lowers the temperature of the liquid through partial vaporization, and thus increases the temperature difference. Thus, while vaporization could not go on at a proper rate without such a heat supply, the lowered pressure under which vaporization takes place is an important adjunct, second only to the heat supply.

Fuel Economy in High Velocities.

The fuel economy resulting from the use of air velocities higher than the average, and thus lower pressures, is quite marked. Of course, with high charge velocities the maximum power is not realized above a certain piston speed; but the fuel economy and efficiency will be greater within the range which the high velocity device can supply without too great a loss per cylinder charge. This latter fact is easily demonstrated by making two series of runs with any multiple cylinder automobile engine. One series should be made with carbureter and manifold passages of such areas that an average charge velocity of about 8,000 feet per minute is had at a piston speed of 1,000 feet per minute; and the other series with passages which will give the above charge velocity at between 600 and 700 feet per minute piston speed.

A comparison of the two series of runs will show that up to that piston speed at which the volumetric efficiency of the engine pumping strokes falls off because of too high a charge velocity the power deliveries are approximately equal, the fuel consumption per brake horsepower hour and the thermal efficiency have each been improved. The passages giving the above charge velocity at the higher piston speeds will permit of the development of a greater power at those speeds, and are thus superior from the viewpoints of maximum economy and efficiency at maximum output, which is the condition desired.

The points which it is desired to bring out are: that the greater the pressure drop in the passages the more perfect will be the breaking up of the fuel, the more rapid will be the agitation and internal motion in the mixture column, the greater will be the vaporization due to pressure reduction; and, as a final result, the fuel will be more thoroughly vaporized, and the mixture more homogeneous. There are in present practice several examples of the above utilization of high air velocities and low pressure in the carbureter passages. In the best of these the maximum charge velocity in the manifold and past the valves is kept down to the value given above (8,000 ft. per min.); and the high velocities and low pressures are secured in the carbureter passages through several spraying nozzles, each located in a separate, small passage. These are put into communication with the manifold in a progressive manner in accordance with the engine demand; and thus practically constant, high air velocities and low pressures are maintained, no matter how many or how few are serving the engine.

The advantages possessed by such a device for the vaporization of the fuel are apparent, though it appears that these devices were primarily designed with a view to securing a more automatic proportioning of the mixture.

Heating Usually Necessary.

If the nozzle and the conditions under which it operates are such that a true mist-like spray is delivered into the air column, no recourse need be had to air or wall heating devices providing the temperature of the air is 60° F. or higher. But, since such conditions very rarely obtain in practice, the expedient of heated air or jacketed mixing chamber walls must often be resorted to.

Because all liquid hydrocarbon fuels are variable and unstable, both their chemical compositions and physical characteristics, it is very difficult to formulate their actions or determine the best conditions under which to utilize them. Experimental data are placed at an equal disadvantage with mathematical and theoretical analyses in that the exactitude of either method is impaired by the non-uniformity of the substance. However, serviceable figures are entirely within reason; and as such the writer submits the following.

The hydrocarbon known as motor gasoline, specific gravity between .70 and .73, is a mixture of individual substances, each combining carbon (C) and hydrogen (H) in varying proportions. A small percentage of oxygen (O) is often present (never to exceed 3.5 per cent.), but, because of its smallness and sometimes total absence, it will be neglected. The several substances composing gasoline are all of the methane series, the chemical formula for which is expressed C_nH_{2n+2}. This means that for the entire series, which comprises some eighteen substances, each combines C and H in the proportion of twice as many atoms plus two of H as there are atoms of C.

The first member of the series present in gasoline, pentane,

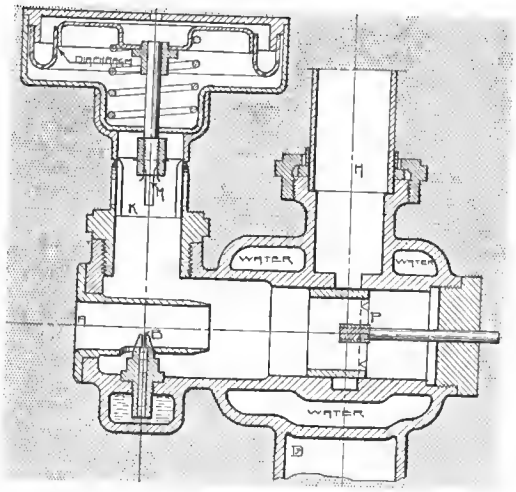
C_9H_{12}, has a specific gravity of .626; the last member, decane, $C_{10}H_{22}$, has a specific gravity of .736. The other members between these two have specific gravities ranging between the two values given and corresponding to their increasing molecular weights. The second member of the series, hexane, C_6H_{14}, is the representative constituent of gasoline, being present in greater quantities than any of the others. Traces of pentane or the members beyond nonane, C_9H_{20}, specific gravity .723, are seldom found in gasoline. Thus, hexane, though much lighter and more readily vaporized than the several heavier members occurring with it, should be used as the basis for any calculations. This use is justified by the high vapor pressure of hexane, as will be explained later.

Chemical Composition.

Taking the chemical composition of hexane, C_6H_{14}, as that of gasoline, its combination with the oxygen of the air to form carbon dioxide, CO_2, and water (or rather steam), H_2O, may be expressed $2C_6H_{14} + 19O_2 = 12CO_2 + 14H_2O$. From the atomic weights of the elements involved, the weight of air necessary for the complete combustion of 1 lb. of C_6H_{14} is found as follows.

The atomic weight of C is 12, that of H is 1, and that of O is 16; thus the molecular weight of C_6H_{14} is $6 \times 12 + 14 \times 1 = 86$; and the weight of the combining oxygen $19 \times 16 = 304$. Thus for the complete combustion of 1 lb. of C_6H_{14}, $\frac{304}{86} = 3.54$ lbs. of oxygen will be required. Since 1 lb. of dry air at 60° F. and 14.7 lbs. pressure contains only .23 lbs. of oxygen, $\frac{3.54}{.23} = 15.39$ lbs. of air are necessary for the complete combustion of 1 lb. of gasoline. This mixture proportion of 1 : 15.4 is known empirically to be that which will develop the highest temperature and pressure in a gasoline engine cylinder with a compression pressure of 70 to 80 lbs.

Before proceeding to the heat necessary for fuel vaporization, it should be determined at what lowest temperature the proportion of 1 of fuel to 15.39 of air, as above, can be maintained. There is a definite limit to the amount of vapor that can exist in a unit volume of mixture at any given temperature. If the



Section of the Krebs Type of Carbureter.

vapors of such substances be treated as gases, because of the then great expansion, the weight of fuel vapor present at any one temperature is proportional to the vapor pressure of that substance at that temperature.

Thus, the amount of gasoline vapor that can exist in a unit volume is measured by the vapor pressure of saturation for that temperature. That is, if air be saturated with gasoline vapor at a certain temperature and pressure, a lowering of the temperature (the pressure remaining constant) will cause a condensation of some of the vapor, and consequently an impoverishment of the mixture. To apply this:

Densities Proportional to Weights.

Since the densities of gases are proportional to their molecular weights at the same pressure and temperature, and the molecular weight of H is 2, that of gasoline being taken as 86, the density of gasoline vapor is to that of H as 86 : 2, or is 43 compared with 1. Therefore the vapor pressure of 1 lb. of gasoline vapor is $\frac{1}{43}$ that of an equal weight of H occupying the same volume. Also, the density of air is 14.44 times that of H; and thus 15.39 lbs. of air has a vapor pressure of $\frac{15.39}{14.44}$ times the vapor pressure of 1 lb. of H occupying the same volume.

Hence the pressure of the gasoline vapor in a mixture of the proportion 1 : 15.39 is to that of the air in the mixture as $\frac{1}{43} : \frac{15.39}{14.44} = \frac{.0233}{1.065}$, or as .0233 : 1.065, from this ratio it follows that $\frac{.0233}{.0233 + 1.065}$ or .0214 of the total vapor pressure exerted by the mixture is due to the gasoline vapor, and that $\frac{1.065}{.0233 + 1.065}$ or .9786 is due to the air in the mixture. If the mixture is under atmospheric pressure of 14.7 lbs. per square inch, there will be exerted by the gasoline vapor a pressure of $.0214 \times 14.7 = .315$ lbs. Tables of vapor pressures show that gasoline vapor can exert a pressure of .315 lbs. at all temperatures above 1.5° F.

It appears that gasoline-air mixtures of 1 : 15.39 can exist at or above 1.5° F. under atmospheric pressure. If the pressure is less than atmospheric, or the ratio of fuel to air is decreased (it will be about 1 : 17 or 18 in average practice), the mixture will persist without a condensing out of any of the fuel vapor at temperatures lower than 1.5 F.

In the above determination of the temperature referred to fuel vapor pressure, the value given is a little high. Only the vapor pressure due to the hexane is there considered. While hexane is the characteristic of gasoline because of its occurrence in great quantities, the total vapor will be the sum of the vapor pressures of the various substances taken at the given temperature. Thus, the two pentanes (iso- and normal), C_5H_{12}, though usually present in insufficient quantities, having higher vapor pressures than the hexane, will tend to raise the vapor pressure, at a given temperature, above that due to the presence of hexane alone. Likewise, the constituents of gasoline heavier than hexane—heptane, octane and nonane—contribute in some part to the total vapor pressure. From this it appears that any error that may be introduced, by the assumption that the vapor pressure and other characteristics of hexane are those of gasoline, is toward an overestimation of the temperature, and will thus fail to effect the results.

Latent Heat of Vaporization.

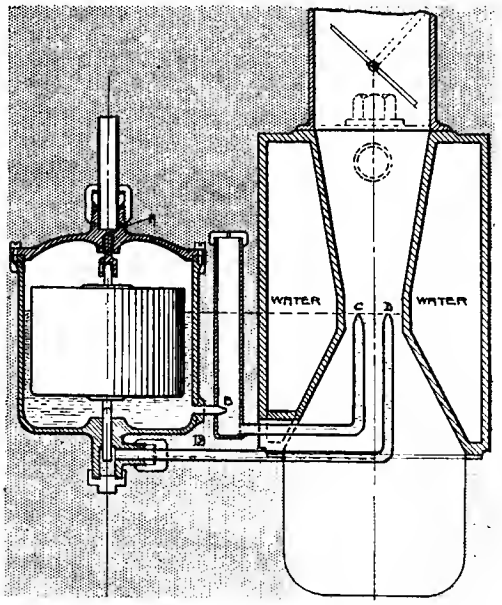
The specific heat or amount of heat measured in B.T.U. (British Thermal Units) necessary to raise 1 lb. of gasoline 1° F. is .500. Hence a drop of 1° F. in the temperature of 1 lb. of gasoline corresponds to the dissipation of .5 B.T.U. The specific heat of air at constant pressure is .2375: and a drop of 1° F. is attended by the dissipation of .2375 B.T.U. per lb. of air. Taking the mixture proportions as 1 : 15.39, as above, the heat available per ° F. of drop in the temperature of the mixture is $1 \times .500 + 15.39 \times .2375 = 4.155$ B.T.U.

Since the latent heat of vaporization is very approximately 210.5 B.T.U., it follows that this 210.5 B.T.U. must be supplied

by the ingredients or by heat from some outside source applied directly to the fuel..

Consider the heat supply in the mixture ingredients themselves. Since the mixture, 1 : 15.39, is capable of supplying 4.155 B.T.U. per ° F. of drop, it will require a drop of $\frac{210.5}{4.155} = 50.66°$ F. in the mixture to completely vaporize the 1 lb. of fuel contained therein. The mixture, 1 : 15.39, cannot exist below 1.5° F., so, it will be necessary that both the air and the gasoline have a temperature of at least 1.5° + 50.66° = 52.16° F. before the commencement of vaporization. If the mixture is 1 : 18, it can exist at -5.8° F., and the initial temperature of the ingredients must be at least 38.3° F.

If the requisite amounts of fuel and air are placed in a vessel insulated from outside heat, the above initial temperature values will hold only when the time allowance for vaporization is unlimited. Compared with the short time in which vaporization must be completed in an automobile engine, the passage of time before vaporization would be completed would be almost



Principle of the Zenith Type of Carbureter.

infinity. However, there are three methods whereby the rate of vaporization may be accelerated: either the fuel may be introduced in a finely divided form; or the initial temperatures of the mixture may be made higher than the above values; or a combination of both methods may be employed.

In any case, the temperature drop can be no more than 45° F. in any mixture of gasoline and air. Therefore, if an increase in initial temperature is resorted to, the final temperature will be higher than that necessary to support the mixture proportions by just the amount that the initial temperature is raised. Suppose an initial temperature of 100° F. and a drop of 45° F. The resulting final temperature in the mixture will be 55° F.

In consideration of the form in which the fuel is presented to the air in the average carbureter, this final temperature will be higher than 55° F. because the total amount of fuel will *not* have been vaporized, and the amount of heat necessary to complete the vaporization will remain in the mixture as a temperature value. But suppose the vaporization to have been completed in two cases with a final temperature of 55° F. in one and 1.5° F. in the other. Since the same amount of fuel is present, the volumes per lb. of the two mixtures, at the same pressures, may be taken as bearing the same relationship to each other as the volumes per lb. of dry air at equal pressures and the two temperatures given. Thus, the ratio of volumes per lb. of mixture may be expressed 1 : .88, for the two mixture temperatures of 1.5° and 55° F. respectively. Therefore an engine can aspirate only .88 the amount by weight of 55° F. mixture as can be aspirated of the 1.5° F. mixture. In fact, the loss in weight of charge will be greater than is here indicated, since the efficiency of the pumping strokes will vary with the density of the fluid.

The power of an engine varies as the weight of charge burned per power stroke, therefore the power delivery will be greater with a lower mixture temperature. Although it is neither desirable nor necessary to aspirate mixture at a temperature of 1.5° F., the above serves to indicate the importance of maintaining the lowest reasonable temperature.

Initial and Final Temperatures.

An initial temperature of 60° F. will be sufficient for vaporization if the nozzle delivers a true spray. This will give a final mixture temperature which is considerably below the freezing point of water, and will thus cause a drying of the air through a condensation of the water vapor present. With perfect spraying and initial temperatures at 60° F., vaporization is still far from instantaneous, and cannot be completed within the carbureter itself.

A temperature as low as 32° F. would not be attained by the mixture within the carbureter and lower manifold, but would begin to be approximated only toward the upper parts of the manifold. The heat conducted from the cylinders by the passage walls is sufficient to obviate a mixture temperature of 32° F. even during the latter part of the vaporization, which takes place quite close to the cylinders. With initial temperatures at 60°, a temperature of 34.5° F. has been observed in a perfectly vaporized mixture just before its entrance to the valve pocket. This seems to show that the heat of the manifold walls entered into the action toward its latter part, and prevented freezing of water vapor while at the same time assisting vaporization. The engine was running at about 950 feet per minute piston speed at full load.

The lowest initial temperatures are determined by the fineness of fuel division, which is determined by several conditions, as mentioned above. If the division is imperfect, a greater heat supply will be needed in order that the vaporization may be complete within the limited time available; but the greater the heat supply, the hotter will be the mixture and the greater the power losses.

In the vaporization of fuel in spraying carbureters it is often found that no air temperature up to 120° F. is efficacious in bringing about complete vaporization within the allowable time. In cases of this sort a change increasing the fineness of the nozzle delivery has always resulted in a more complete vaporization, and where the fineness of delivery has been progressively increased to a possible maximum value it has been found feasible to form a mixture, throughout the speed and power ranges, of perfectly vaporized gasoline and air with an initial temperature of 58° F.

In a typical spraying carbureter the method of application for best results will depend upon the character of the fuel spray, upon the constriction of the mixing chamber, and the form of the manifold passages. If the division at the nozzle is fairly fine, the application of additional heat as an increased initial air temperature will, in general, be of the greater value. This is more particularly true if the carbureter and manifold passages are free from bends. If the passages are tortuous, a heating of the walls will assist vaporization with a less expenditure of heat, and will give an equally good mixture with a lower resultant temperature than will a heated air supply. If the nozzle delivery is very poor as regards division, heated walls will serve best.

The whole question as to which of the two methods is best for any specific case resolves itself into another question—with what is the liquid chiefly in contact after it leaves the nozzle? If the nozzle so divides it that it remains chiefly entrained in

the air column, a heating of the air will give the best results; if the division is coarse, the liquid will be spread over the walls, and a heating of the walls will then be the better method, subject to the same condition of proper temperature maintenance. In conclusion on this matter of vaporization, it must be emphatically repeated that the extent to which fuel division is carried at the nozzle determines the temperature at which the mixture can be formed, and also its character referred to the degree of fuel vaporization and homogeneity.

Viscosity Lowered by Temperature Increase.

The foregoing considerations of temperature and heating effects apply solely to the matter of vaporization of the fuel. However, there is one direction in which temperature assumes a great importance as affecting mixture proportions, *i.e.*, variations in the temperature of the liquid fuel within the nozzle. Gasoline is commonly thought of as having a very low viscosity. This is true, but the viscosity of gasoline is lowered quite rapidly with temperature increases. The comparative weights of gasoline of .71 sp. gr. flowing through the same passage and under the same pressure difference, with variations in temperature, are given in the following:

Temperature °F.....	50°	59°	68°	77°	86°	95°
Weight in unit time.....	1	1.073	1.145	1.212	1.27	1.335

With the fuels of higher specific gravity the increase in quantity with increase in temperature assuredly is higher.

The above change in the weight discharged with change in temperature throws some light upon the tendency of carbureters supplied with heated air from a chamber about the exhaust manifold to "lose" their adjustment. With heated air supplied in this way, it has been repeatedly observed that the temperature of the air entering the carbureter will vary as much as 30° F. under changing conditions of running, the surrounding atmospheric air being at between 70° and 75° F.

Since in most carbureters the greater portion of the nozzle is so placed as to be directly in this heated air column, it stands to reason that the temperature of the nozzle walls, and consequently that of the fuel flowing through, will follow that of the air with a difference of but a very few degrees. If a constant initial air temperature could be maintained through the main air port, it would make no difference what temperature was employed; but with the exhaust manifold as the source of heat, is a practical impossibility, since its own temperature will vary from 300° to over 1,000° F.

Of course, the velocity of the air through the heating chamber will vary so that the higher velocities will be simultaneous with the higher temperatures, and this will tend toward constancy of temperature, but the relationship of the velocity to the temperature cannot be made such that a given temperature will be maintained to within more than 10° or 15° F.

THE BATTLE OF THE BEARINGS IS STILL IN PROGRESS

By CHARLES E. DURYEA, Technical Expert, A. M. C. M. A.

EVER since wheels were invented the problem of how to overcome the friction effects has been before the world's mechanics. Automobile makers have not been limited by the cost, so have been free to equip their vehicles with the best devices possible to secure, and have been certain that among America's wealthy buyers would be found customers for whom the best was none too good. This has resulted in a variety of arrangements of bearings as well as of kinds not ordinarily found in any single piece of machinery.

While for years there have been users of roller and ball bearings, not until the last two years has the problem come before the public in large form. The introduction of a type of bearing known as the annular, which is nothing more than the simplest possible form made up in a most superior manner, set a new mark for auto makers and called their attention to ball bearings quite forcibly. These annular bearings have been fitted to every possible part of the vehicle from the small accessories such as the pump, fan, or magneto, to the most essential parts, such as the wheels, transmission, and even the motor.

Because like begets like, this use of anti-friction bearings has spurred the makers of roller bearings and of the older adjustable types of ball bearings to renewed activity and borne fruit of great value to motor vehicle users generally.

Many people have doubtless wondered why the ball bearing unknown practically before the advent of the bicycle, has become so common and is admittedly so good at the present time; with a variety of forms of roller bearings competing for supremacy. The explanation is simple. Both ball and roller bearings must be well made to be long lived, and it has not been many decades since factories were fitted to turn out such work at prices within reach of the buyers, so the motor vehicle has caused a great forward step in mechanical progress by demanding the best and commanding prices sufficient to permit makers supplying the demand.

If one ball or roller is slightly irregular or slightly larger than the others, it must take all the strain and not only receive damage itself but very likely damage the surfaces on which it rolls. This is why such bearings are all right if they are right, and are all wrong if every part thereof is not right. This is why occasional failure results, and why only the most exceeding care in manufacture and in assembling is necessary if the desired results are to be obtained.

Admitting this perfect workmanship, the question still remains as to which is the better ball or roller, and whether these are to be preferred to the older form of plain, bronze or babbitt bearings, with which the world is better acquainted. On this point designers differ, and each is guided in his selection by the nature of his service, by the conditions surrounding the bearing, by the probable care or lack of care it will receive, the ease or difficulty of lubrication, and largely by the speed of the moving part. In general, bearings designed for high speed and free from shock are of the ball variety, while bearings intended for heavy loads and lower speeds are more usually fitted with rollers, leaving the plain bearings for places where the strain is intermittent or in the nature of shocks such as are received by the bearings of an internal combustion engine. That practices are far from universal in following this procedure is shown by the use of roller bearings to all wheels by the Acme, Glide, Stoddard-Dayton and some of the Lambert models, while ball bearings are used by the American, the Austin-Brush, Chadwick, De Luxe, Gaeth, Gearless, Moon, National, Pennsylvania, Premier, and some others. Other designers have balls at one place and rollers at another, and like the American Simplex and the Marmon, have rollers to the front wheel bearings, and balls to the rear, or like the Mitchell, the Moline, the Olympic and the Regal, have balls to the front and rollers in the rear. In general, the use of roller bearings seems to be increasing, although the users of ball bearings have lost no enthusiasm, and their use is rapidly extending particularly to the smaller parts, where space and weight is of some importance. The fact that the roller gets a line of contact instead of a point renders it more able to carry a heavy load, and thus accounts for a preference in the certain places. The tendency toward the use of ball bearings on the motor shafts seems not to be increasing, although the new Holsman motor employs balls throughout. Unquestionably, the anti-friction bearing will do in future a still larger part of the world's work. particularly at the wheels and axles where loss of power is important and where a saving means greatly reduced gasoline bills. This is a question that must in the long run receive more attention than it has been accorded.

LETTERS INTERESTING AND INSTRUCTIVE

TROUBLE IN STARTING AN OLD-TIMER.

Editor THE AUTOMOBILE:

[1,692.]—Can you help me out through "Letters Interesting and Instructive"? I have a Franklin four-cylinder air-cooled car of the 1904 model, the motor having automatic intake valves. I am having a great deal of trouble with my car lately, finding it impossible to start without priming the cylinders, although it is easy enough to start once the motor is warm. If allowed to cool off, there is always the same trouble in starting. When after slowing down for a street crossing, the throttle is opened up again, the motor seems to choke and sometimes I have to drop from high in order to give the motor a chance to pick up again. I have just ground the exhaust valves and everything seems O. K. I have a good 8-volt, 25-ampere-hour storage battery, fully charged, and cannot understand why the machine should act in this manner. Do you think putting on a Schebler carbureter would overcome the trouble?

Any information that you can give me on this through "The Automobile" will be appreciated. CHARLES B. FRANKS.

Corona, N. Y.

It is nothing unusual to have more or less difficulty in starting any car in cold weather, and priming is commonly resorted to, so that your trouble in this respect would not appear to be particularly serious. The "choking" you speak of is due to a derangement of the mixture by the sudden opening of the throttle and is caused by the failure of the auxiliary air valve to work promptly, as a rule, though some other lack of adjustment may also be responsible in your case. The result is that the mixture is flooded with gasoline before the extra air supply becomes effective. Carbureters have been improved to such an extent since the car you have was built that we should think the purchase of an up-to-date type would be a good investment.

WHO HOLDS THE TRANSCONTINENTAL RECORD?

Editor THE AUTOMOBILE:

[1,693.]—Will you please advise me in "Letters Interesting and Instructive" who holds the record from New York to San Francisco and return, also the time. Is the New York "Times" to hold such a race next Fall, and, if so, by what route? W. C. M.

Poughkeepsie, N. Y.

The only round trip from coast to coast of which there is any record was made by Megargel and Fassett in a two-cylinder 16-horsepower Reo and consumed 285 days from New York to Portland, Ore., to San Francisco and back. No attempt at speed was made. The best time across the continent from San Francisco to New York was made by L. L. Whitman and C. S. Carris in a six-cylinder 30-horsepower Franklin. By running night and day, they made it in 15 days, 2 hours, 10 minutes, and would have bettered this but for an accident. Under touring conditions and carrying a party of seven people, J. M. Murdock crossed in a Packard "Thirty" last Spring in 32 days, 5 hours, 25 minutes. The Thomas "Flyer" in the Paris-New York race made the trip in mid-Winter in 42 days, 2 hours, 5 minutes, to San Francisco, the Murdock record being from Los Angeles.

The New York *Times* has proposed a race to San Francisco and return, but at the present writing the matter is not in such a state that any definite information can be given concerning it.

CARS WITH A LEFT-HAND CONTROL.

Editor THE AUTOMOBILE:

[1,694.]—In your December 10 issue you speak of a number of factories which will place the control on the left of their cars. Will you please give me the names of these makers, as I am very anxious to have their catalogues? J. T. TUNIS.

Lexington, Ky.

At the present writing, so far as we know, the only cars that will be distinguished in this manner during the coming season will be the Ford, Babcock electric, and the Atlas taxicab. The last named refers to a number of these cabs that have been ordered by a New York company for use in the metropolis, and we are not certain that this will be the regular equipment of these cars for cab use.

SOME DATA FOR A TWO-CYCLE DESIGN.

Editor THE AUTOMOBILE:

[1,695.]—Will you kindly give me your advice concerning a two-cycle, four-cylinder engine I am building. Would a two or three-port type be best suited for slow speed work? How would make-and-break ignition do for this style of motor? What make of carbureter would you advise? What size for 2 1-2 by 2 3-4-inch motor? What weight of flywheel would be advisable for a motor for this size having four cylinders. W. B. WATERMAN.

San Diego, Cal.

The three-port type of two-cycle engine is generally considered more simple and reliable than the two-port, though the latter gives very little trouble on slow-speed work, particularly where the load is at all steady. There is no reason why make-and-break ignition should not be as efficient on such a motor as it is on a four-cycle motor. There are so very many different makes of carbureters on the market which the manufacturers list as specially adapted to the two-cycle engine that it is almost impossible to select any one as being the best. Consult the maker whose carbureter you decide to invest in regarding the size. Half-inch would be ample for such a small motor. The weight of the flywheel will depend entirely upon the diameter you intend to make the wheel. If this is to be 16 to 18 inches, 30 pounds, as much of which should be in the rim as possible, would be sufficient.

A BAD CASE OF CARBURETER POPPING.

Editor THE AUTOMOBILE:

[1,696.]—Will you please answer, either by letter or through your next issue of "The Automobile," the following query, as I am sure that any of your subscribers who are owners of the Pope-Hartford 1905 machine have had and are now having the same trouble that I am.

After cranking my machine it will run nicely and continue to do so until I apply the throttle, whether the machine is moving or standing still, it will begin to explode at the air hole of the carbureter and will eventually get so that I have to release the throttle or the entire machine will stop. However, I can run along just as long as I use the sparker (and not the throttle). Of course, I believe my trouble is caused by the engine getting hot, but what is causing that and what is causing the carbureter to, as it were, spit back through the air tube?

I have just attached a new oiler, which is working nicely, am now using the same carbureter that the Maxwell cars have, have put new hose onto the pump, etc., and the circulation of water seems to be perfect. I have at times fed so much gasoline (in the hopes that that was my trouble) that the smoke is perfectly black.

The machine got this way about a year ago and I never could find out the trouble, and I have written the Pope-Hartford people and they don't seem to know the cause. I wish to add that I have just attached a new radiator. WALTER M. DUNLAP.

Rock Hill, S. C.

This is what is commonly known as "popping" at the carbureter, and it is usually caused by improper carbureter adjustment, as seems to be the case with your car. The motor runs well at a certain speed simply because the present carbureter adjustment happens to furnish a mixture that is approximately correct for that speed, but the moment the throttle is opened, the proportions of air and gas in the mixture are thrown entirely out of balance. The result in your case is probably an over-rich mixture, which is accordingly heavily charged with gasoline vapor and is slow burning, so that it is still afire—or, more properly speaking, considerable of the pressure created by the explosion still exists in the combustion chamber when the inlet valve opens to admit a new charge. The pressure naturally escapes through the inlet valve, and as its only outlet is the air port of the carbureter, it rushes out there with a pop. It will be evident that sudden and sharp drafts of this nature through the carbureter in a reverse direction will upset its functioning altogether, and either cause the motor to run very erratically owing to the intermittent and improper supply of fuel, or to stop altogether. Neither the water circulation nor the lubrication would appear to have any bearing whatever on your trouble, which presents nothing more than the usual symptoms.

If there be any question of the carbureter being deranged in any way, dismount it, clean the various parts and reassemble carefully. Open the nozzle valve sufficient to enable you to start the motor, and then very gradually close it until the motor will no longer run regularly upon the supply thus allowed. Reopen again very gradually until the gasoline supply is such that the motor will run constantly. By very gradually in this case is meant merely a fraction of a turn at a time as it is easy to pass by the point of proper adjustment. This will give you as nearly perfect a mixture for slow speed as can be obtained under service conditions. Should the very lowest point at which the motor will run without missing, cause hard starting, it is well to open the nozzle a bit further. Having reached this point, the auxiliary air valve should be adjusted to provide the proper mixture at the higher ranges of speed. Open the throttle slowly and note whether the motor "follows," *i.e.*, speeds up regularly and without missing in proportion to the increasing throttle opening. If the spluttering and popping occurs, accompanied by black smoke, release the tension of the spring somewhat so that more air will be drawn in; if the reverse be the case, the motor missing, due to a thin mixture, tighten the spring. The overheating you complain of and which you seem to have gone to a great deal of trouble to correct has probably been due to the constant use of an overrich mixture, which may or may not have been aggravated still further by running with the spark more or less retarded.

FAULTY TIMING PROBABLY THE CAUSE.

Editor THE AUTOMOBILE:

[1,697.]—I havs a two-cylinder Ford, 1904 model, the engine of whlch does not give the power it should. so I would like to see if you can help me out of my difficulties through "Lstters Interesting and Instructlve." The engine seems to drag and lose power. It will not climb grades on the high and overheats so that it pounds very badly. Do you think the valve timing or the ignition is at fault? How can they be timed correctly? If this is not the probable trouble, what other causes and remedies would you suggest? How can I rebabbit a connecting rod bearing? I would like to make the repair myself, but am at a loss to know how to do it. Have thsre been any articles on ths timing of valves and ignition in "The Automobile" during 1908? If so, in what issues did they appear?

East Orange, N. J. PERPLEXED.

It seems more than probable that the trouble with your motor is caused entirely by faulty valve and ignition timing due to wear. Cams, push rods and tappets all wear more or less in constant service, and this is likewise true of camshaft bearings, so that in the aggregate a slight amount on each would be responsible for a very perceptible difference in the valve timing, which would naturally tend to become later and later. This, in the case of the exhaust valve, would account for the overheating as the waste gases would be retained in the cylinder that much longer, and it would also account for the lost power as the inlet would open much later, preventing the inspiration of a full charge, this also being defeated by the high temperature of the motor.

Before attempting to readjust the timing, examine the camshaft bearings and if they allow sufficient play to have any influence on the valve opening, renew them first. The cams should also be looked to, and as they are undoubtedly pinned to the shaft, they may be replaced if found to be worn badly. Wear on the push rods and valve stems may probably be compensated for by adding slightly to the length of the latter, if necessary.

If the builder of the car has provided a guide on the flywheel for timing the motor, this had better be followed. If not a good timing for such would be about as follows: Open inlet valve 5 degrees past upper dead center, hold open 15 degrees past lower dead center; open exhaust valve, 25 degrees before reaching lower dead center, setting it to close at upper dead center or slightly beyond. This is on the assumption that the motor is designed to run at 800 to 1,000 r.p.m., which is probably the case as the horizontal twin-cylinder motor is not usually a high-speed type. The degrees are measured on the flywheel rim. Ignition should occur about 20 degrees in advance of reaching upper dead center on the firing stroke, assuming that coils and batteries are employed. The timer should be carefully inspected and made good; probably by replacing it with a modern type.

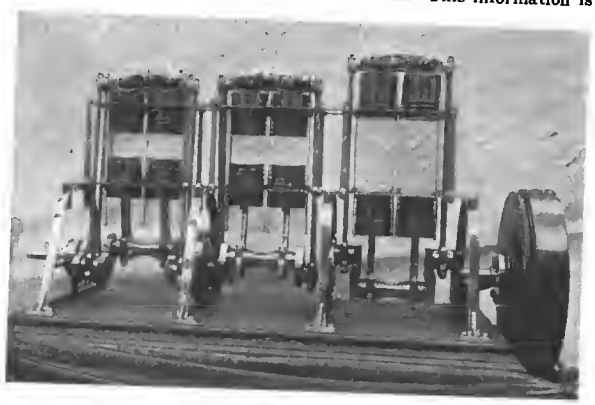
The proper method of timing the valves and ignition of a motor have been described several times under this heading, and a special article on the subject will be found in the issues of October 29 and November 5, 1908.

To rebabbit the bearing, line up the parts in exactly the relation they should bear to one another when working, after having thoroughly cleaned them. The bearing should rest on a block of wood so as to clear the bench all round. Take stiff putty and build a dam to close one end of the bearing, making allowance for the formation of a shoulder when the metal is poured. Make a similar dam at the other end forming a spout at the upper side in which to pour the metal and this spout should be made an inch or two higher than the level of the bearing. Use a high-grade babbit, bring it almost to a red heat, skim off the dross and pour quickly.

AGAIN THE GOBRON BRILLIE MOTOR.

Editor THE AUTOMOBILE:

[1,698.]—In your issue of November 26 you inform ons readsr, in letter No. 1,651, and show in a little design what is called a section of the double piston idea of the Gobron motor. This information is incorrect. The sketch shows the piston idea of the Boudeaux-Verdet motor with differential pistons, while the Gobron system is one of the opposite pistons type. I includs a motel motor photo with glass cylinders, which was exhibited in the Paris Salon, 1907, and it will show the idea in a quite satisfactory manner.



Illustrating the Gobron Motor of 1908.

EDITOR "ALLGEMEINE AUTOMOBIL-ZEITUNG."

Berlin, Gsrmany.

LOOK OUT FOR THE SMOOTH-FACED STRANGER.

Editor THE AUTOMOBILE:

[1,699.]—A very good desd which you could do would be to notify your readers warning them against a gentlemanly-appearing crook who drives a 1907 Pope-Toledo touring car. He is a dark-complexioned chap, with smooth face. He stops autoists and pretends to be in trouble, then borrows something in the tool or tirs line. I was charitably inclined and loaned him an inner tube. He gave ms a fake name and addrese—the latter was a church in Brooklyn. This same gentleman has also "bitten" others. He operates mostly around the parks. FRANK ALDEN MILLER.

New York City.

A NEW RECORD WORTH EMULATING.

Editor THE AUTOMOBILE:

[1,700.]—I wish to rscord something different. Last Monday, when all ths horses in Buffalo were suffering from the effects of a snow fall, a "friend in nsed" pulled ons of thsm and his heavy load (the horse had been stalled) with an automobile, and I guess dellvered ths goods. I didn't ses the end of tbe haul.

The friend was George Ulrich, who will be remembered as Mechanic No. 2 in tbe first Glidden tour. Hs wsnt through ths "flood" with Percy Plsrce and the Pierce Stanhope. He is a good fellow, as everybody knows connected with autoing. H. T. DUNKAR.

Buffalo, N. Y.

WHY THE AMERICAN MAKER NOW LEADS THE WORLD

By BENJAMIN BRISCOE, Chairman A. M. C. M. A.

ONE significant feature in connection with the rapid growth of the American automobile industry is a corresponding decrease in the business of the European manufacturer, who until only a short time ago had to be considered America's most formidable rival. As a matter of fact, the French manufacturer has to make preparations to defend his own market from the threatening invasion of the American product.

Even the most ardent desire to pay tribute to the ingenuity of the foreign manufacturer cannot remain blind to the evidence that the American manufacturer has recognized the various problems and possibilities presented by the new conveyance and taken care of them with greater alacrity. It is true that the automobile designer, particularly the foreign one, is prone to follow his engineering ideal to the detriment of the utilitarian side of the question. The American manufacturer, on the other hand—and this is perhaps an attitude characteristic of the American spirit exemplified in other fields—early came to the conclusion to cater to public demand as soon as such demand would assume definite shape. The result of this policy was the low-priced and economically-maintained car.

The American automobile is a nearly perfect car, and this result was attained not only by the use of good material and skilled workmanship, but principally by providing interchangeable parts, so that it is possible to produce units in great numbers with a single setting of machinery during the entire season. In short, the difference in foreign and American manufacturers' methods is that existing between making automobiles and manufacturing them. In the American method everything is interchangeable and in the foreign method it usually is not. It is a well-known fact that has been established to the edification of a New York taxicab concern that it is rarely possible in the French product to take the motor out of one chassis and place it without difficulty and without drilling new holes in the frame of another car. The two principal reasons for the superiority of the American product consists in low price and interchangeability of parts—the one produced by the other. The third factor is the reliability of the American car, and an additional element the much greater field in this country upon which the automobile can show its usefulness.

While the foreign manufacturer suffers from the evils of over-production the more important American makers find themselves in the other extreme, being generally oversold at a time when the yearly production is barely under way. Much of the present popularity of the American motor car is due to standardization and to a condition in which rapid changes are no longer the rule, but the exception.

It may not be too much to say that the precedents established by foreign makers and the ability of the American engineer to avoid the mistakes of his precursors has had much to do with our present advantageous position and our command of the world's automobile market.

That the American market will control the world's automobile demand there is no doubt, and the opportunities for such control are only beginning to manifest themselves.

THE SUPERIOR SPRINGING IN THE CARS OF TO-DAY

By CHARLES E. DURYEA, Technical Expert, A. M. C. M. A.

THE old adage that "details make perfection," is each year being given new life by many details of automobile construction, and in no one of these may it be seen more clearly than in the springing of the present day which will be exhibited at the Grand Central Palace automobile show, the first week in January.

The springs of horse vehicles were the product of a century of growth and development, from the time when the massive coach bodies were hung from four posts by leather straps so that they could sway in almost any direction and thus avoid the jolting of the wheels over the uneven roads of those days. From such crude hanging to the light, flexible and easy riding springs of the modern buggy was indeed a long step, requiring many years of trial and failure, till proper proportions, proper steels, and proper mountings were secured.

The motor vehicle developed a new problem. The earlier makers found it almost necessary to carry the mechanism above the springs in order to protect its many fragile parts from the road vibration, and this necessitated transmitting the power to the driving wheels through some flexible connection such as chains, or universal jointed shafts. Naturally, the makers sought to lessen their trouble by employing springs of minimum elasticity and greatest strength in order that they might the more safely carry the heavy and crude mechanism. As a result of this policy, the earlier motor vehicles were notoriously stiffly sprung and uncomfortable to ride in.

The last year or two has brought about great changes in these respects. Propeller shafts and their universal joints have been lengthened and improved until they are no longer regarded as sources of trouble, and until they permit large amplitude of spring movement both vertically and sidewise, much as does the spring under the usual horse vehicle. While few riders stop to think of the effect of this rolling or sidewise movement of the body, it is none the less true that the vehicle in which this movement is permitted rides more easily and is not affected by any qualities at one side of the road or the other, as is a vehicle less flexible in this direction.

The mechanism itself employed in modern autos has been designed to withstand or to permit greater wheel movement and greater spring action than was true in the earlier construction, so that springs to-day show not only greater elasticity but a greater variety of forms. Steel makers are doing their part by providing steels of better quality, especially adapted to the severe service of automobile work.

A few years ago the semi-elliptic spring fastened to the axle at its centers and to the body at its ends, was the common and almost generally accepted form. This spring permitted a vertical movement, but was practically rigid sidewise, and so served well to hold the axles in line with the mechanism and thus enable chains to follow the sprockets and transmit power in a satisfactory manner.

The full elliptic spring, a most common form on horse vehicles, was not considered so satisfactory in auto work, because it had less sidewise rigidity, while platform springs, the most flexible of all, were not to be thought of.

This year will show a much larger variety as exemplified by full elliptics on the Reo, Regal, Premier, Pennsylvania, Oakland, Mora, Moon, Moline, McIntyre, Maxwell, Marmon, Jackson, Holsman, and others, while some models of these same makers will show semi-elliptic, as will the Acme, the American, the Austin, Chadwick, De Luxe, Ford, Gaeth, Gearless, Glide, Mitchell, and others.

Three-quarter elliptics will be found on the Reo, Pennsylvania, Premier, and Austin.

Platform springs are used on the Stoddard-Dayton, one model of the Pennsylvania, Moon, National, and American. In a few instances double springing is used consisting of one spring within another, whereby one takes the lighter load.

The Finest Automobile Ride in the World

By O. L. Halsey

THE title is true. There are just 14 miles of it, but those 14 miles yield more interest and more indelible impressions than any other 14 miles of road extant. This is the St. Gothard Pass, in the Alps.

It forms a part of the most direct route between Como and Lake Lucerne. It crosses the mountain range whose name it bears and whose highest peak, the famous Galenstock, rises nearly thirteen thousand feet. The pass itself reaches an altitude of 10,000 feet, being anywhere from one to four thousand feet higher than the more recently constructed railroad pass and tunnel underneath.

Such geographical specifications seemingly would insure the pass of St. Gothard to be a famous and well-patronized automobile highway. The contrary is true. The average automobilist, whether home-spun European or imported American, avoids the pass of St. Gothard. It is a road for the daring, and its charms, that are visible from every turn of the road, are well worth the venture.

Occasionally St. Gothard Pass Twists Through a Beautiful Mountain Village.

We were touring Europe in our Packard "Thirty" when we came to the pass. Its grandeur and its difficulties were recounted to us. We decided in favor of the grandeur, and learned that touring Europe in an auto is one thing of which a ride through St. Gothard Pass is not a part, but another and bigger thing.

At the entrance is Airolo, a typical cluster of chalets, plus hospice and railroad station. We reached there late in the afternoon and learned that automobiles may venture on St. Gothard Pass only in the evening and early morning. To be exact, they are allowed on the pass between 5 and 7 P.M., and 6 and 8 A.M. The better part of the permitted two hours is required to make the journey.

We went that evening. With a strange apprehension that was almost timidity we looked up from beautiful Airolo into the snow-coated mountain peaks that hid all but the first few turns of the wonderful pass. Then we started from summer into winter; from a temperature of 82 degrees to a temperature of 10 degrees; from pleasant, comfortable touring into difficult, uncertain, and dangerous mountain scaling; from a prettily set village into stern heights where mere prettiness would be an insult to the view's magnificent portions indescriptive in words.

When this pass was built for the moving of armies, no other purpose was taken into consideration. Seldom is it wide enough to allow the safe passage of two vehicles. In many places, one vehicle has a narrow and precarious footing on the mountainside. For miles it is possible to look over the side of the car, down perpendicular rock walls, to snakelike torrents of melted snow a thousand or two thousand feet below. There is no wall on the outer edge of the pass, the greatest precaution for safety being a slight curb, five or six inches high. Sometimes the road slants downwardly toward the outside.

The prompt ascent after passing the guard house necessitates learning a new kind of automobile driving. The steep grade is a succession of sharp, narrow turns. Some of these angles were so acute that it was impossible to turn them without stopping and backing the car. As we progressed, we learned to negotiate these turns somewhat more easily by swinging just at the right point and just inside of a corner where the pass ended and a vertical precipice began. All the time it was steady, hard climbing on second speed. The motor settled down to an unquivering gait, and there was no break in the even progress except an occasional acceleration at the acute turns where it was necessary to increase speed in order to make them without shifting gears.

We were awed by the dangerous character of the road; by the natural respect which the mountains themselves commanded, and by the occasional glimpse of the ubiquitous Swiss bayonet, thrust over a stone wall or a pile of rocks. In St. Gothard Pass you are always between two evils. You must not stay in the pass more than your allotted two hours and you must not exceed certain speeds to get out of it in that time. However, you are not angry at restrictions. The road is dangerous enough when you are the only traveler on it. It is no place for meeting other automobiles. "Joy riders" should not come here.

Devil's Bridge That Spans a Mountain Stream.

The man behind the bayonet never speaks and you do not answer. Sign language is sufficient. We, in the climbing car, did not even talk to one another. There are some places where conversation is profanation. This is one of the places.

Where St. Gothard Pass Becomes a Pitch Black Tunnel.

Where the New Railway Is Visible from St. Gothard.

The echoing blast of an Alpine horn put us in a quiver. It meant the approach of a skidding stage coach descending with wheels locked. We took no chances in passing vehicles on that road. Fortunately, there is little other traffic than the mail coaches, a few local carts traveling short distances and, in the lower altitudes, herds of sheep.

Once we shot down a sharp and unexpected decline to find ourselves headed for a small black hole in the face of an immense expanse of rock. There was just room to steer the car into it clear of the walls. Daylight was snapped out in the infinite blackness. We were scared, but we did not light the lamps. For what seemed a day, and probably was a quarter of an hour, we drove through this winding tunnel, guided only by the reverberation of the trilling motor against the rock.

When at last we left the streak of night, we found the winding shelf illumined by the mellow lights of evening. Again we climbed, climbed and climbed up the mountain wall. It was cold and we huddled together in the car.

We ran through snow, blown in icy sheeets against our faces. Looking upward, the pass was faintly and more faintly marked at each successive turn it took along the mountain. It seemed an unending journey to the peak above, and when that goal was reached, we saw again the zigzag pathway to the next.

The wonderful background of lurid fires where the sun sank behind the glistening snow caps; the devious road disappearing in the subdued colors of cloud-toned twilight; the great solitude —all of it was awesome, fascinating, overwhelming.

Tensely silent, we rode to the highest point. There the strain was broken by the marvelous beauty of the panorama spread at our feet. We stopped and clambered out of the car for a last look over the valleys and peaks, snow drifts and glaciers, rivers and villages, passes and tunnels of this Alpine region as pictured from the turrets of Galenstock.

For an hour we had not spoken. We were chilled to the bone. There had been no sound except the ceaseless purring of the motor. Our farewell glance upon the scene was a lingering one. The winding four-mile descent to Andermat was begun reluctantly. Once on the way, however, we slid and scrambled down that shelf as fast as we could without going over its side. That was the hardest job of steering I ever have done. It was a case of 100 per cent. accuracy, because there was no allowance at any place along the twisting road for the mistake of an inch.

Afterward, we continued our tour through Europe (some 6,000 miles altogether) but that, to me, is always another story. Whenever I think of those 14 miles on St. Gothard Pass, I immediately forget all of the other automobiling which I have done in deep appreciation of the wonders of this finest of all automobile rides there are in the whole wide world.

PARIS TO HAVE MOTOR-DRIVEN FIRE BRIGADE.

PARIS, Dec. 17.—All horses have to be dismissed from the city of Paris fire brigade and their places taken by gasoline motors. The order has been given by the Municipal Council after two years' close experimenting with mechanically driven engines and fire tenders and would be put into force immediately were it not for the heavy cost. There are at present 76 horse-drawn fire engines in the city of Paris, costing annually a sum of $64,000; if they could all be immediately transformed into gasoline engines the annual upkeep cost to the city would not exceed $17,400. The cost of transformation, about $320,000, will be spread over a period of six years.

Here the Pass Is Between Pastoral Scenes and Peaks.

The Hospice at the Terminal of the St. Gothard Pass.

WHY don't more women drive automobiles? There are, to be sure, a great many women who drive cars as skilfully and successfully as any male driver, and it is an interesting and noteworthy fact that each season there is a considerable increase in the number of women who become owners and operators of motor-driven vehicles. A few years ago a woman driving a car unattended attracted much attention and was viewed with undisguised curiosity by all who saw her. There was only now and then a woman who had the termerity to make an attempt to operate an auto, and, indeed, when one considers the imperfections of the car built a few years ago, one can more readily appreciate the many obstacles that she had to contend with and overcome if she became a successful driver. Cars were then far more complicated, mechanically, than any at present, but even so it was fully demonstrated that there were some women who possessed the ability to overcome these obstacles, and who—probably possessing a tendency toward things mechanical—mastered the intricacies of the gasoline engine and succeeded admirably as operators.

Before leaving home for a trip the car should be carefully looked-over—this will occupy but a few minutes and save much annoyance from troubles on the road. The batteries and coil should be tested, the spark plugs clean, the gasoline and water tanks well filled, and there should be a plentiful supply of lubricating oil. An abundance of oil should always be kept in the crankcase of the engine, the change gear box and the rear axle or differential. Each and every wearing part—the

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Then there are the women whose husbands do not approve of the feminine portion of the family aspiring to the honor of driving the family car. His real reason is without doubt in many cases a wholly selfish one—he fears her proficiency and does not want her to use the car as often as she would wish were she capable of its operation. But in spite of the many cynical shafts of alleged wit that some "superior" men love to launch at feminine autoists, the woman who drives and understands her car has a distinct advantage over the woman who motors without enthusiasm, and who does not know the difference between the spark plug and the rear axle or a Wray muffler from the device which silenced, and there are very many motorists of this type.

Then there is the motor woman who dislikes machinery—who is afraid of soiling her hands or gloves or gown with a bit of oil or grease, and who considers herself of far greater importance and far more elegant when seated like an automaton in the tonneau of the car dressed as elaborately as the pastime will possibly permit, with a miniature powder puff always ready to dab her nose occasionally for fear a little dust may settle thereon.

But the time has come when the ambition of the woman autoist is to be able intelligently to understand the mechanical features of her car and to learn to drive well that she may go about when and where she wishes without being bothered with a professional chauffeur. There are very many women who might enjoy the pleasures and benefits of autoing were it not that they doubt their ability to learn how to drive and how to overcome obstacles. The majority of these same women would be perfectly able to master the modern car after some practical instructions from an expert.

A great many women who could easily manage their car hesitate to do so through mistaken ideas of the difficulties to be overcome. The very first thing necessary for the woman who has decided to become an owner and driver is to select her car. If she is wise she will pick one which is simple in construction, for this is an important factor when she is to drive the car herself. Of course, a car of standard manufacture is always preferable to one little known, and a moderately powered car will answer her requirements perfectly. The first duty after purchasing the car is to become perfectly familiar with it, for the greatest pleasure of autoing is to be able to do all things about the car that exigency may demand.

The first time the woman operates her car alone she will have very little confidence in her own ability. It is always wise to practice turning—backing about and turning around—plenty of room as free from obstruction as possible should be found to experiment in.

One should learn to control the speed of the car with spark and throttle as much as possible and only release the clutcher when absolutely necessary. The low gear should only be resorted to in extreme cases. The spark should be used for speed and the throttle for power. Gradually familiarizing oneself with the operation of the car, the disengaging of a clutch or applying of a brake will become practically automatic.

axle joints, steering gear, change gear levers, brake mechanism, etc., should be liberally oiled.

It is always important that the gasoline should be strained before putting it into the tank—it only requires the tiniest bit of grit or dirt to clog up the carbureter. The two most important factors to look after in connection with a gasoline engine are the flow of gasoline and the electric spark. The ignition system should be watched and gone over carefully from the batteries to spark plug. If an engine slows up the trouble is very likely in the mixture of gas supply or to the batteries running down. When the engine comes suddenly to a stop it is practically certain that the cause is some defect with the ignition system. If an engine slows up and stops and then after a moment starts up again and runs a mile or two, it is a sure sign that the batteries are run down. An engine seldom stops abruptly without preliminary warnings.

Sometimes a mixture of gas is exploded in the muffler by the heat of the exhaust. This is called back-firing and is caused by too great a supply of gas being fed to the engine. As this cannot be fired or exploded it is forced into the muffler with the exhaust gases. A sure sign of too much lubrication is blue smoke coming from the exhaust, and when too much gasoline is being consumed the smoke will be black. An over supply of either oil or gasoline will cause dirty valves and sooted plugs.

A constant buzzing of the coil denotes a short circuit. The coil should buzz only when a spark is wanted. When the coil does not buzz it is an indication of no current, caused either by weak batteries or broken wiring.

After a woman has operated her car for some time she can readily tell by the sound whether the engine is running smoothly and correctly. If there is premature ignition, loose bearings, loose distance rods, any small obstruction in the sprocket or gears, or a broken or loose framework, or, in fact, any unusual sound, it should be immediately investigated and eliminated, if possible, for although one may be able to get home the damage done is quite apt to be expensive to the owner. When the engine has become overheated and the pistons are jammed tightly by lack of water, the cylinders can be tested by sprinkling a little water on them. If the water hisses and immediately dries off the tank must not be refilled until cool. Some kerosene can be poured into the pistons while they are hot. This can, of course, be taken from the lamps. If the pistons have become seized the cooling process will be a slow and tedious one. There are symptoms, however, that indicate overheating, such as a violent pounding of the engine, steam issuing from the filling nozzle, water coming out of the overflow pipe while driving, continued firing after the ignition is off and smoke rising from the engine. If these symptoms are noticed, and kerosene is injected into the cylinder, meanwhile turning the engine by hand, the temperature will go down and the pistons will move freely. The most effective way to cool a heated bearing is to pour water on it until cool. It should be well oiled before attempting to run the car again.

In driving it is quite unnecessary to disengage the clutch or to apply the brake when turning corners. The speed of the car should be lessened by throttling as the corner is approached and opening up when about half way around. Plenty of room should always be allowed in case of the car skidding. In climbing steep grades it is necessary to drive with the spark a little slower and throttle well opened. The engine should never be allowed to race; the moment it begins to race the spark should be retarded. An engine is at its best when run at its highest speed without racing.

A car should never be left standing alone without setting the brake and removing the switch plug. Testing the brakes every day only takes a second and is an important thing.

The woman autoist must have her car positively within control before attempting steep grades. In ascending the principal requisite is plenty of power, while in descending the brakes are an absolute necessity if danger is to be avoided. When the woman is driving she must give all her attention to her work. She cannot look around at the scenery, talk over the latest fashions with her friends or forget her responsibility, for the slightest mistake or a loss of control of the wheel may result seriously if not fatally to herself and companions.

One should at first confine themselves to short trips until they have learned to understand each and every piece of mechanism of their car and the proper function of each. On long trips it is especially necessary to thoroughly know the motor. When that is accomplished longer trips may be taken with perfect safety, especially if a little previous experience will have the effect of instilling confidence, which is an asset not to be ignored.

The woman who is learning should above all else be possessed of the virtue of patience. She cannot expect to learn to know her car at once. Perseverance and patience and time will work wonders and constant association with things mechanical gives one a degree of skill in manipulating tools that will astonish the novice. Common sense is the first principle needed to run a car. Ingenuity is another needed requisite, and with intelligence and the desire to become proficient the average woman may confidently expect to develop into a successful and expert car driver.

TENTATIVE SCHEDULE FOR EUROPE'S BIG 1909 EVENTS

PARIS, Dec. 17.—In accordance with an established custom advantage was taken of the presence of delegates to the Paris Salon to draw up a calendar for automobile events in 1909. At present the dates are only tentative, the interested parties being given until January 15 to make changes or additions. After this time all new events proposed must be on days that do not clash with the program now drawn up.

In January the only important features are the Brussels Show, held from the 16th to the 25th, and the Turin Salon, from January 30 to February 14. During February the Monaco motor boat and aeroplane races will be held; during March there will be a number of events on the Mediterranean coast, but none of them of more than local interest.

There will be a small industrial and taxicab competition in the neighborhood of Paris from April 15 to 25; motor boat races will be held on the Sicilian coast on the 25th and four days later the Sicilian voiturette race will be held.

May 2 has been selected for the Targa Florio, in Sicily.

Moscow-St. Petersburg automobile race will be held on May 26.

Germany and Sweden will both hold industrial vehicle competitions during the month, the exact dates to be decided by mutual agreement.

June 10 to 18 will see the competition for the Prince Henry Cup in Germany. Kiel regatta is fixed from June 24 to July 3 and Switzerland will hold an industrial vehicle competition on the same dates.

The French Grand Prix has been scheduled for July 1 to 3, the first day probably being for weighing-in and the two following days for the voiturette and big car races.

Ostend automobile week will take place from July 13 to 17; and from July 24 to August 2 Amiens will hold an exhibition for agricultural automobiles.

Mont Ventoux will be climbed on September 5.

Italy will have its great race under international rules at Bologna from September 11 to 19; Semmering hill, in Austria, will be climbed on September 19.

Austria will hold a commercial vehicle competition from October 3 to 17, and the Automobile Club of France will have a similar demonstration and test from November 18 to 28.

COMPLEX CHARACTERISTICS OF AUTOMOBILE BODIES

By COKER F. CLARKSON, A. L. A. M.

ONE of the most important branches of the complex automobile industry is undoubtedly that connected with the body. When the first gasoline machines made their appearance, the questions of comfort, appearance and durability in body work were relatively neglected. There were a few American carriage builders with sufficient foresight to perceive the trend of events, banish their prejudices and meet the demand of the automobile manufacturer and user more than half way.

Wood still plays an important part in high-class automobile body work. And if satisfaction is to be given, it is essential to employ none but carefully selected and thoroughly dried pieces.

For the making of automobile wheels on the artillery plan only the most carefully dried wood, without flaw of any description, should be considered. One firm claims that up to the present time no accident arising from a faulty wheel produced by it has been reported.

All the wood is many years old. It is stocked in buildings, ventilated by a special system, and packed layer on layer with joists between, in order that the drying process can continue evenly. The entire stock is examined every year and turned. At least five years elapse from the entry of a piece of wood into the storage, before it is cut up for use.

It is interesting to go through the various departments from the designing rooms to the varnishing hall with its even temperature, excellently arranged lights and dust-proofness.

There is nothing mysterious in good coach work, although it is surprising to find the great number of parts required to build up a limousine or laudaulet, the strength of the iron-work and the tremendous number of coats of finish. The paint on a large limousine body weighs much more than the average man would say; as much as seventy-five pounds or more. The painting and trimming of the car is in material degree specialized work. Good painting cannot be done on other than a good foundation, with the proper graduation of the several coats of paint and varnish.

The strains to which a motor car body is subjected are greater than and considerably different from those in the case of a horse-drawn vehicle. No one engaged in making cabinets, furniture, house or other stationary fittings, could have any knowledge derived from the practice of his own business of what is necessary for the automobile. The framing of the timber, the use of panels, not merely as enclosures, but as trusses supporting the external framing, the hanging of the doors and provision for the clearance for paint, etc., have to be studied specially. The supposition that springs can give ease of riding when comparatively little attention has been paid to the form or material of the body and its trimmings is responsible for much discomfort.

The Mechanical Branch of the Association of Licensed Automobile Manufacturers has held meetings with representative carriage makers, to see whether the latter can reduce the weight of bodies to any extent, and to interchange ideas on other interesting subjects on which the automobile engineer and the body maker are working.

The Carriage Builders' National Association was founded thirty-five years ago, and about twenty-five years ago established a technical school in New York for the instruction of carriage draftsmen. The idea of this school is to turn out men who can take a draft and work from it; or go back to the bench as workmen, their wages being increased by their technical knowledge: or later on perhaps, secure employment as draftsmen to the exclusion of other work.

You can take two men and put them side by side in construction; let one man know his business, understanding just how the thing should be proportioned; he will turn out a body that will be stronger and better than the man at the next bench: and there will be one hundred to one hundred and fifty pounds less weight in the product of the good man.

One serious thing that the automobile and the body maker have been up against is the man who wants to have a body built that will carry one person with the springs riding easily, in which he can pile eight or ten people and have the springs ride just as easily; which is somewhat like making a linen duster and a fur coat out of the same cloth.

The makers of wood automobile bodies will not acknowledge that bodies made of aluminum are lighter than those made of wood; but maintain that the real state of facts is the reverse. By the use of templets practically, some excellent bodies are now being turned out with great rapidity.

The question of metal panels on bodies has another feature besides weight. One of the things that has troubled the carriage manufacturer is cracks and splits in the panels; which aluminum or sheet metal construction eliminates. The extreme heat and cold of a country are factors to be considered. A body built for example, in England, France, Germany or Austria, which have moist climates, different from ours, may last there for years, and give trouble here, in steam-heated garages, etc., by what is called "opening up." This is one reason why it is customary to kiln-dry lumber here, whereas abroad anything but air-dried lumber is rare or unknown. Moreover, the kind of wood generally used in this country has a lower coefficient of contraction and expansion, besides being stiffer.

Some body makers use aluminum-coated steel for panels, to avoid checking in painting and what is known among painters as "graining out."

As a rule automobile bodies are lighter than a corresponding body on a horse-drawn vehicle; for example, the rocker plate and sills of an ordinary landau, which weigh one hundred and sixty pounds, are eliminated in an automobile body.

No doubt people who have built metal automobile bodies up to the present time will in the future use increasingly, processes not dreamed of a short time ago, welding parts to make them integral, doing away with the use of rivets, screws, etc. Of course, there has already been much development in the use of cast aluminum for bodies.

The American carriage builders are now thoroughly aware of the changing character of their trade and welcome the automobile. They appreciate keenly the business of the automobile factories and are willing to work with them in every way. The members of the Licensed Association are pioneers in this co-operative work as in many others. When the automobile started, the average carriage maker pooh-poohed it, and would not take hold. In Europe no automobile maker has ever built a body, except one German firm who built a low-priced one.

MICHIGAN AS AN AUTO-MAKING STATE.

LANSING, MICH., Dec. 28.—The growth of the automobile and allied industries in Michigan during the year 1908 has been enormous, according to the records of the Secretary of State. This in spite of the fact that 1908 was one of the most unfavorable years in the industry. The records show that no less than 22 new corporations were organized for the manufacture of automobiles or motors, the conducting of garages, or the developing of the gas engine. These 22 corporations have a combined capital of $2,400,000.

In addition to the 22 new corporations, 11 more engaged in these industries have increased their capital stock from $2,340,000 to $6,500,000. This makes the new incorporations and additions to capital during the past eleven months in Michigan alone aggregate nearly $7,000,000.

These figures do not include the large organizations of the Cadillac, the Oldsmobile, Reo, Chalmers, Buick, Reliance, Brush, and some of the other important companies. The estimated dividends earned during the year will aggregate $50,000,000.

THE AUTOMOBILE

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THE GRAND CENTRAL PALACE SHOW

Displayed to the best advantage possible under the circumstances, the automobiles at the "Palace" are there to do justice to the promises made for them. That the exhibition would be more in keeping with ideals, would be true were the Palace quite double its actual size, but this would add nothing to the quality of the cars or the enthusiasm of the exhibitors and the spectators. There is a distinct tone of rejoicing which is steeped in confidence, and participation is general. The makers recognize the fact that they undertook much in their endeavor to make and deliver a greatly increased number of superior cars at a far lower price, and they rejoice now that the task is substantially completed. The spectators knew full well what was going on and were curious; the public is always on the lookout for an ambush. On this occasion the public are quick to recognize what will go down in history as an agreeable situation.

Makers have been promising that the 1909 automobiles would be full fledged perfected products, at the price which formerly represented the purchasing power of little better than runabout types. Generally such statements are the product of viewing things through rose colored glasses, at a distance so far that the actual state of things would be unrecognizable. As it is, the whole situation is as simple as A, B, C. The products are actually there, they are in such profusion that choice is going to be a difficult task and the worst choice possible to make will land a better automobile than the best that double the money would buy, even one single year ago. It is not that the makers are in a mood to deliver something for nothing; they fully intend to pay dividends; the chances of succeeding are much enhanced.

What is it that crept into the automobile business that thus rendered such a condition possible? Was it because the business fell into the hands of men of more skill? Decidedly no! The whole situation is representative of the old adage, i. e., "practice makes perfect." The time was sure to arrive when automobile co-operation, involving the makers of cars and the fashioners of materials, would result in a perfected product. The countless detached and incongruous ideas were either incorporated, or cast aside, depending merely upon their abstract value. The horde of theories in relation to materials were reduced to a settled few and the process of manufacture was put on a basis involving the duplication of parts, each like the other, all in full compliance with a settled plan.

Harmony reigns supreme, and the direct result is lower prices, better cars, and assured dividends. The purchaser (the intelligent purchaser) is as much interested in the question of dividends, as in the direct question of the quality of the offering. To acquire a car from a company that is about to embrace the "receiver" is to take out a license to pay an enormous price for repair parts, and wait until they are whittled out by hand in a repair shop. This is not all. The product will soon look like an odd number on the road alongside of the outpourings of shops that do keep in the procession; and, on the whole, it is a moral certainty that such a purchase will prove little short of a total loss. The weaklings, of which there were a surprisingly small number, went down last year. The survivors were wise enough to break out in such vigorous profusion as to be too formidable to be captured by any temporary flurry that might come their way. In the meantime, it was realized that a certain standard of excellence did render itself manifest and that anything short of that standard would be unsafe, especially in view of the fact that automobiles have to be built in large quantities before they can be disposed of. In large quantities to influence the price, and in view of the influence of season, and the time it takes to turn them out, to be able to deliver at the propitious time, there is but the one way. Under the circumstances, it would be foolhardy to come on the market with a large quantity of "freaks." No man of business acumen would attempt it, nor can such examples be found at the show.

Let it not be supposed that the cars on exhibition are prototypes of each other. For every want there is a make of car to fill it. The respective makers have selected the *clièntele* to which they propose to cater, the result is a diversity that renders the show of far more than passing interest, and the patrons of the industry will be afforded ample opportunity to display their skill in the process of selection. If it is true that the conventions were observed in the designing of cars, it is equally true that individualism has had ample scope to render itself manifest. The patron with an "ideal" in his mind's eye will find the car to match it if he looks long enough.

NEXT COMES MADISON SQUARE GARDEN SHOW

BUT eight years ago, it was a difficult matter to stretch the meagre amount of available material at hand sufficiently to make even a passable attempt at covering the main floor of Madison Square Garden; for the Ninth National Show, which is next on the boards, January 16-23, the space on the ceiling would be utilized if that were possible. As it is, by planning and scheming, a greater number of exhibitors than has ever before been accommodated by the Garden will hold forth there in a few weeks, the official list of exhibitors showing an increase of fully two score over last year, or a gratifying total of 294.

Standard makes of licensed cars will be grouped for the most part on the main floor, the remainder being on the elevated platform surrounding it, in the café and in the basement, while the electric vehicle exhibits will be confined to the exhibition hall. All the commercial vehicles will be in the basement. A recapitulation shows 47 exhibits of complete cars, 26 motorcycle exhibits, and 221 exhibits of parts and accessories. The exhibitors and the spaces they will occupy are as follows:

Main Floor.

1 Knox Automobile Co.
2 Matheson Motor Car Co.
3 Elmore Mfg. Co.
4 Cadillac Motor Car Co.
5 Pope Motor Car Co.
6 Royal Motor Car Co.
7 Autocar Co.
8 Everitt - Mstzger - Flanders Co.
9 Corbin Motor Veh. Corp.
10 Studebaker Auto. Co.
11 Lozier Motor Co.
12 Electric Veh. Co.
13 F. B. Stearns Co.
14 Packard Motor Car Co.
15 Geo. N. Pierce Co.
16 E. R. Thomas Motor Co.
17 Chalmers-Detroit Motor Co.
18 H. H. Franklin Mfg. Co.
19 Locomobile Co. of America.
20 Pope Mfg. Co.
21 Winton Motor Carriage Co.
22 Stevsns-Duryea Co.
23 Peerless Motor Car Co.

Elevated Platform.

24 Selden Motor Veh. Co.
25 Haynes Auto. Co.
26 Simplex Auto. Co.
27 Hewett Motor Co.
28 Walter Automobile Co.
29 Woods Motor Veh. Co.
30 Ths Whits Co.
32 Apperson Bros. Auto. Co.

Exhibition Hall, Madison Avenue Front.

50 The Waverly Co.
51 The Electric Veh. Co.
52 The Rauch & Lang Car. Co.
53 S. R. Bailey & Co., Inc.
54 Ths Anderson Carriags Co.
55 Babcock Electric Carriage Co.
55 Studebaker Auto Co.
57 Baker Motor Veh. Co.

Basement, Commercial Vehicle Department.

75 Knox Automobile Co.
75 General Veh. Co.
77 Champion Wagon Co.
78 H. H. Franklin Mfg. Co.
81 Studebaker Auto Co.
82 E. R. Thomas Motor Co.
84 Alden Sampson, 2nd.
85 Hewitt Motor Co.

Elevated Platform, Accessories.

100 Ths B. F. Goodrich Co.
101 Tbe Diamond Rubber Co.
102 C. F. Splitdorf.
103 Goodyear Tire & Rubber Co.
104 Shelby Steel Tube Co.
105 Tbs Brown-Lipe Gear Co.
106 G. & J. Tire Co.
107 Briscos Mfg. Co.
108 Gilbert Mfg. Co.
109 Auto. Improvement Co.
110 Amer. Elec. Nov. & Mfg. Co.
111 Vacuum Oil Co.
112 Herz & Co.
113 S. F. Bowser & Co., Inc.
114 Gray & Davis
115 The Veeder Mfg. Co.
116 R. E. Dietz Co.
117 Atwater-Kent Mfg. Wke.
118 Baldwin Chain Mfg. Co.
119 N. Y. & N. J. Lubricant Co.
120 Warnsr Inetrument Go.
121 Light Mfg. & Fdy. Co.
122 Empire Auto. Tire Co.
123 The Autocoil Co.
124 The Swinehart Clincber T. & R. Co.
125 Rsmy Electric Co.
126 Dow Tire Co.
127 Jonss Speedometer.
128 Conn. Tel. & Elec. Co.
129 Morgan & Wright.
130 Continental Caoutchouc Co.
131 Spicer Universal Joint Mfg. Co.
132 J. H. Sager Co.
133 The R. E. Hardy Co.
134 Ajax-Grieb Rubber Co.
135 Weed Chain Tire Grip Co.
135 Consolidated Rubber Tire Co.
137 F. H. Wheeler.
138 Witherbee Igniter Co.
139 The Republic Rubber Co.
140 The Duff Mfg. Co.
141 Ths Chandler Co., Inc.
142 Michslin Tire Co.
143 Leather Tire Goods Co.
144 Adam Cooks Sons.
145 Avery Portable Lighting Co.
146 Fox Metallic Tirs Belt Co.
147 Globe Machine & Stamp Co.
148 Janney, Steinmstz & Co.
149 Firsstone Tire & Rubber Co.
150 Oliver Mfg. Co.
151 Timken Roller Bear. Axle Co.
152 Hartford Suspsnsion Co.
153 Penn. Rubber Co.
154 Manufacturers Fdy. Co.
155 Motsinger Device Mfg. Co.
155 Atwood Castle Co.
157 Byrns-Kingston & Co.
158 Ths Wm. Cramp & Sons Ship & Engine Bldg. Co.
159 A. W. Harris Oil Co.
160 Brennan Mfg. Co.
161 Ths Warner Gear Co.
162 Phineas Jones & Co.
163 Tbs Standard Welding Co.
164 American Ball-Bearing Co.
165 Ths Badger Brase Mfg. Co.
166 The Fisk Rubber Co.
167 Diamond Chain & Mfg. Co.
168 Pittsfield Spark Coil Co.
169 Ross Mfg. Co.
170 Whitnsy Mfg. Co.
171 The Hartford Rubber Wks. Co.
172 A. R. Mosier & Co.
173 Gabriel Horn Mfg. Co.
174 Joseph Dixon Crucible Co.
175 Heinze Elec. Co.
176 C. T. Ham Mfg. Co.
177 Valentine & Co.
178 Hyatt Roller Bearing Co.

Balcony.

200 McCord Mfg. Co.
201 Geo. A. Haws.
202 C. A. Shaler Co.
203 W. C. Robinson & Sons Co.
204 Cook's Standard Tool Co.
205 A. C. Smith Co.
206 Eastern Carbon Wke.
207 Allen Auto Specialty Co.
208 Jeffery-Dewitt Co.
209 Morrison-Ricker Mfg. Co.
210 N. Y. Sporting Goods Co.
211 Metal Stamping Co.
212 Hydraulic Oil Storags Co.
213 Hopewell Bros.
214 J. S. Bretz Co.
215 Pierson Motor Supply Co.
216 Havoline Oil Co.
217 Apple Elec. Co.
218 Isaac G. Johnson & Co.
219 The Auto Pump Co.
220 Ths Rushmore Dynamo Wks.
221 English & Mersick Co.
222 E. M. Benford.
223 K. W. Ignition Co.
224 Austro-American Ssparator Co.
225 Wm. R. Winn.
226 N. Y. Coil Co.
227 Voorhees Rubber Mfg. Co.
228 American Thermos Bottls Co. of N. Y.
229 L. J. Mutty Co.
230 The A.-Z. Co.
231 High Frequency Ignition Coil Co.
232 H. H. Franklin Mfg. Co.
233 Keystone Lubricating Co.
234 Leon Mann Co.
235 P. Rielly & Son.
235 Phila. Timer & Machine Co.
237 Jarman & Baker.
238 R. I. V. Co.
239 Atlas Rubber Co.
240 Champion Ignition Co.
241 Burnet Compound Spring, Inc.
242 Buda Fdy. & Mfg. Co.
243 Chas. E. Miller.
244 Trenton Rubber Mfg. Co.
245 O. W. Young.
245 Anderson Forge & Mach. Co.
247 M. H. Cormack & Co.
248 Geiszler Bros.
249 Wm. P. Miller Sons.

Concert Hall.

300 The Spragus Umbrella Co.
301 L. C. Chase & Co.
302 Noera Mfg. Co.
303 Columbia Lubricants Co. of N. Y.
304 The Hess-Bright Mfg. Co.
305 National Carbon Co.
306 Ths Lunkenbeimer Co.
307 National Battery Co.
308 The Hoffecker Co.
309 Westchsstsr Appliance Co.
311 Standard Rollsr Bearing Co.
312 Ths Randall-Faichney Co.
313 Edmund & Jones Mfg. Co.
314 The Pantasote Co.
315 Elec. Storage Bat. Co.
316 Manhattan Screw & Stamping Wks.
317 Springfield Mstal Body Co.
318 Gemmer Mfg. Co.
319 C. Cowles & Co.
320 Coes Wrencb Co.
321 Never Miss Spark Plug Co.
322 Stewart & Clark Mfg. Co.
323 C. A. Mezger, Inc.
324 American & Britisb Mfg. Co.
325 Rands Mfg. Co.

Second Tier Boxes.

400-3 Bosch Magneto Co.
404 Columbia Nut & Bolt Co.
405 H. A. Allers & Co.
405 Traver Blowout Patch Co.
407 Paul S. Reeves & Son.
408 The Seamless Rubbsr Co.
409-10 Sampson Leather Tirs Co.
411-12 Davis-Bournonville Co.
413 The Psrfection Wrench Co.
414 Eris Foundry Co.
415 Ernst Flentje.
415 The Sirsno Co.
417 Duffy Grease Co.
418 Coloris Mfg. Co.
419 Union Battery Co.
420 Chicago Wind Shield Co.

Third Tier Boxes

425 Vesta Accumulator Co.
427 Ths Mica Cors Mfg. Co.
428 Nadall Mfg. Co.
429 Eilts Mfg. Co.
430 Auto-Tire Inflatsr Co.
431 Amer. Elec. Fuss Co.
438 John Lucas & Co.
439 H. & C. Bottle Mfg. Co.
440 A. O. Brictson.
441 The Standard Leather Washer Mfg. Co.
442 The "Lux" Auto Lamp Mfg. Co.
443 Quincy, Manchester, Sargent Co.
444 Marko Storage Battery Co.

Basement, Accessories.

500 Pattereon, Gottfried & Hunter.
501 Healy Leather Tire Co.
502 C. J. Downing.
503 Kitses Storage Batterw Co.
504 The Class Jour. Co., (Motor Ags).
505 The Claee Jour. Co., (Automobile & Auto. Trade Dir.)
506 Horssless Age.
507 Albert Champion Co.
508 E. T. Burrows Co.
509 Stromberg Motor Devicee Co.
510 Julius King Optical Co.
511 Livingston Radiator Co.
512 The White & Bagley Co.
513 Vehicle Apron & Hood Co.
513a Hill Dryer Co.
514 Amsr. Thermo-Ware Co.
515 Chilton Printing Co.
515 Auto. Supply Mfg. Co.
517 Lavalette & Co.
518 Perfection Spring Co.
519 Automobile Topica.
520 Automobilia, Ltd.
521 The New Departure Mfg. Co.
522 Stanley & Patterson.
523 Vanguard Mfg. Co
524 Merchant & Evans Co.
525 Motz Clinchsr T. & R. Co.
525 The Post & Lester Co.
527 Motor.

Basement, Motorcycle Department.

529 Merkel Light Motor Co.
531 The Consolidated Mfg. Co.
532 Excelsior Supply Co.
533 N. S. U. Motor Co.
534 Motorcycle Pub. Co.
535 Amsrican Motor Co.
536 Hsndee Mfg. Co.
537 F. A. Baker & Co.
538 The Pierce Cycle Co.
539 Bicycling World Co.
540 Ovington Motor Co.
541 Reading Standard Co.
542 Aurora Automatic Mach. Co.
543 Hornecker Motor Mfg. Co.
544 Harley-Davidson Motor Co.
545 Ths Auto-Bl. Co.
545 Thiem Mfg. Co.
547 The Motor Car Equipment Co.
548 Walton Motor Co., Inc.
549 H. & F. Mesinger Mfg. Co.
550 G. H. Curtiss Mfg. Co.
551 Eclipse Machins Co.
552 New Era Gas Engine Co.
553 Reliance Motor Cycle Co.
554 Crouch Motor Co.
555 The Persons Mfg. Co

Basement, Accessories.

556a G. L. Econimizer Co.
557 Comptoir D'Innovations Pour Auto.
559 Nathan Novelty Mfg. Co.
550 Noonan Tool & Mach. Co.
551 Pratt & Whitney Co.
563 Phila. Storage Battery Co.
554 Troy Car. Sun Shade Co.
555 The Garvin Machine Co.
555 Faultless Auto Tube Co.

W. K. V. JR., TRIES CUBAN ROADS.

HAVANA, Dec. 28.—Governor Magoon, who retires from office January 1, received a sincere compliment together with personal congratulations from William K. Vanderbilt, Jr., and a party of friends who have been motoring through Havana Province. They declare great satisfaction with the new roads built by Governor Magoon, saying that they compare favorably with the well-known roads in France. Cuba is also recommended by this party as a touring place at this time of year, the scenery being beautiful, the aspect of the towns and the character of the people commendable, which, with the smooth roads, make this portion of the country a new and delightful touring ground. Mr. Vanderbilt's party is traveling on his turbine yacht *Tarantula*, and autos are carried along.

PRESIDENT-ELECT TAFT BELIEVES IN AUTOING.

That President-elect W. H. Taft is going to be a good autoist is demonstrated by his continuous use of a White steamer at Augusta, Ga., where he is spending a Winter vacation. Mr.

President-Elect Taft as a White Steamerite.

Taft's family is shown in the picture herewith given, and the commodious car answers for family uses of various kinds.

In the photograph Mrs. Taft is sitting next to the President-elect on the rear seat; the older children, Robert and Helen, are sitting in the revolving seats, and Charlie, the youngest child, is next to the driver, H. N. Searles, who has been in charge of President Roosevelt's White cars for two years.

MICHIGAN CITY TO SUPPLY MUNICIPAL AUTOS.

LANSING, MICH., Dec. 28.—Apparently not to let the reputation of Lansing as an automobile town suffer, the local Council and the manufacturers are designing to furnish automobiles to all the city departments. The new Webb fire engine on an Oldsmobile car has been in use by the fire department for a month now, and it has shown up so well under all manner of difficult tests that there is no question that it will be accepted. In addition to this, the Oldsmobile company has furnished the fire chief with a special car for his use, and now it is reported that the same manufacturers will donate an auto to the chief of police.

D. S. LUDLUM, NEW AUTOCAR MANAGER

PHILADELPHIA, Dec. 30.—Announcement has been made of the resignation of David S. Ludlum as assistant cashier of the Philadelphia National Bank to assume the presidency and general managership of the Autocar Company, of Ardmore, one of the pioneer and best known automobile plants in the country.

Mr. Ludlum's abilities, coupled with his successful business career, qualify him for the responsibilities and duties which devolve upon the manager of so large a concern.

While coming into contact with many great business enterprises of the country, Mr. Ludlum was attracted by the automobile industry as a field of great opportunity for immense development, and particularly that field comprising the commercial side of the industry. This is the field to which the Autocar Company is now devoting the major part of its capacity, having during the past two years perfected a commercial chassis of a special design, of high efficiency and much flexibility, including delivery wagons, town cars, taxicabs, etc.

It is predicted by those who know Mr. Ludlum's personality that he will not be long in becoming prominently known in this promising field of the manufacturing world.

John S. and Louis S. Clarke, who were the founders of the Autocar Company, will retain their positions of vice-president and consulting engineer and continue their present active connections with the company.

POSSIBLE CORBIN REARRANGEMENT.

HARTFORD, CONN., Dec. 28.—Howard S. Hart, former president of the Corbin Motor Vehicle Corporation of New Britain, has made two distinct offers to buy out the concern. The last offer was made a few days ago, but did not prove entirely satisfactory to the controlling interests. Before Mr. Hart retired as president of the company he had things pretty well in hand, so that matters are now quite satisfactory to the stockholders. It is understood that Mr. Hart was to have formed a large company for the manufacture of the Corbin cars in the event of his offers being acceptable. There is a strong desire to segregate the motor car business from the affairs of the American Hardware Corporation, and some time ago a committee was appointed to look into the workings of the Corbin Motor Vehicle Corporation. The directors of the American Hardware Corporation will hold a meeting on Wednesday of this week and a report on the Corbin situation will be submitted in all probability. Mr. Hart has said that there is at present no open proposition on and if any advances are made they must necessarily emanate from the Corbin Motor Vehicle Corporation. The outcome is awaited with much interest.

POPE COMPANY NOW IN COMMAND.

HARTFORD, CONN., Dec. 28.—On Saturday of this week, January 2, the Pope Manufacturing Company will anticipate the payment of $267,000 of its 6 per cent. notes, issued under the reorganization plan and due August 1, 1911. This will leave $533,000 of notes outstanding, of which $266,000 mature August 1, 1909, the balance August 1, 1910. The subscribers to the notes are called upon for the payment of the balance of their subscriptions January 2, 1909.

Vice-Chancellor Howell, of Newark, has authorized the receivers of the company to pay the final dividend of 25 per cent. and 6 per cent. interest to the creditors.

CLAIMS AN ORDER FOR A THOUSAND.

YORK, PA., Dec. 28.—The Hart-Kraft commercial car recently made its first appearance on the streets of York, when a local department store put on the new delivery wagon. The new car made quite a hit with a number of York merchants, and as soon as orders can be filled, there will be a number of the new cars on the streets within a very short time.

AUTOMOBILE ROW OF COUNTRY'S METROPOLIS

"AUTOMOBILE ROW," New York City, extending in Upper Broadway for forty blocks north from Forty-second street, is a livelier scene to-day than ever before in its short history, although the era of removal from the little, old "Row" of five years ago in Thirty-eighth street, only a short block in length, has been completed, and the wonderful expansion in salesroom and garage facilities that occurred in 1906 and 1907 has been succeeded by a temporary lull to allow the normal growth of trade to catch up.

There are very few vacant salesrooms in "Automobile Row," and such as are idle have been so only a short time and are not likely to remain vacant long, notwithstanding rentals are high. The only big garage that has been erected in Broadway this year has just been completed at Sixty-fourth street. It was built by capital outside of the automobile industry and is the largest garage and sales establishment on Broadway. It was erected by Robert Goelet, and is of concrete construction, thoroughly fire-proof and up-to-date. Enough applications for space in the new Goelet building have been received, it is said, to fill it several times over, and it is expected that occupancy will begin early in the new year.

The only other large garage that is vacant stands at Broadway and Fiftieth street and has never been occupied since it was erected about three years ago by the Wendel estate, which has refused many offers from automobile concerns to lease it.

Garages on side streets where rentals are lower, are in active demand by new taxicab operating companies, which have had great difficulty in finding suitable quarters. The New York Taxicab Company, which operates 600 Darracq motor cabs, has just completed and occupied a new fire-proof brick garage in West Thirty-seventh street near Tenth avenue. The cost of construction was about $200,000. During the past Summer and Fall the company was obliged to keep more than 100 of its cabs in live storage under a big circus tent in a vacant lot on Eighth avenue between Fifty-seventh and Fifty-eighth streets. It also has unexpired leases on two old livery stables in West Sixtieth and West Sixty-second streets, just off Broadway, which it has occupied since it started the taxicab era in the Fall of 1907.

Cost of Broadway Garages.

Garages in Broadway range in cost from $100,000 to $500,000 each, and it is estimated that they have a combined capacity to house about 10,000 automobiles. The development of "Automobile Row" has been so rapid that there are few remaining available sites for large garages between Forty-seventh and Seventy-second streets. Three large garages erected by the Century Realty Company at the northwest and southwest corners of Broadway and Sixty-second street were leased at full market rates by the builders and before the completion were sublet by the lessee at almost double the first rentals.

Although five years ago the greatest "Automobile Row" in the world was the Avenue de la Grande Armee, in Paris, New York's "Automobile Row" in upper Broadway now exceeds it in the attractive character of its salesrooms and garages and also in volume of sales. The new Thoroughfare building, occupying the block in Broadway between Fifty-seventh and Fifty-eighth streets, has become a very beehive of dealers in motor car specialties. While little building was done by automobile companies during the past year, the coming year is sure to see renewed activity, since it has been announced recently that the Peerless Motor Car Company has bought a large plot of ground at Broadway and Fifty-seventh street and intends to build a large modern salesroom for its own use; and A. T. Demarest & Co., the carriage builders and agents for several foreign cars, have leased an adjoining plot for the erection of a new building on the immediate corner of Fifty-seventh street. This move is particularly significant of the decline of the fine carriage trade and the rise of the automobile to fill the vacancy thus made.

Plans for new buildings specified as garages filed with the Department of Buildings during the year 1908 had a combined estimated cost of $320,000 for five structures, as compared with $272,000 for nine garages for which plans were filed during 1907. These figures, however, are no criterion of building activity or of value of Broadway garages, since many of the latter are specified as salesrooms and storage, while the smaller garages are for private use.

Enormous Retail Trade of Metropolis.

The extent of the automobile retail trade in New York is so great that it would be a herculean, if not actually an impossible, task to arrive at even an approximately accurate record of sales. This can be done only by the active and honest co-operation of all of the branch houses, agencies and importers through such a central organization as the New York Automobile Trade Association and the affiliated Importers' Automobile Salon. The time for this does not appear to have arrived yet, however, and until the trade has settled down more and managers have more time to devote to the interests of the trade as a whole instead of to individual interests, there is no inducement to establish a statistical department for the keeping of lists of dealers and records of sales.

From the carefully revised lists of "The Automobile Trade Directory" we find that in Manhattan and the Bronx there are about thirty branch houses of American motor car manufactories, about seventy additional agencies for American cars, and thirty agencies for foreign cars. There are seven automobile manufactories in the city itself. In all, there are 125 garages for the care and storage of machines, as distinguished from salesrooms, and thirty of these are equipped as charging stations for electric vehicles. Fifteen shops make a specialty of repairing only. Of jobbers in sundries and supply dealers there are thirty-three. In Brooklyn there are forty agencies for automobiles—nearly all domestic—and there are sixty garages.

Development of the Taxicab.

One of the most remarkable developments of the year just closed is the taxicab business. Very few persons, even in the automobile industry itself, have any real conception of the rapid growth of this new business, which did not exist at all two years ago. The lists show that there are more than forty companies and livery stables in New York City now engaged in operating motor cabs equipped with fare calculating and indicating instruments. While many of these are small and operate only a few machines, it is safe to say that there are half a dozen that are running fifty or more cabs, and that there are now more than 1,000 taxicabs at work in the metropolis.

Sales During the Year.

Sales of cars during the past year in this city can be arrived at only roughly by calculation from State registrations in Albany. A store-to-store canvass would, if anything, be less accurate owing to the unwillingness of many dealers to divulge the exact amount of their business. In New York State the surprising number of 65,000 automobiles have been registered during 1908. Some 15,300 of these are new registrations that did not appear the year before, and, according to the Auto Directories Company, 60 per cent. of these, or 9,180, are from Greater New York. Of this number, 20 per cent. may be assumed to be transfers of second-hand cars, since the State Law requires the issuance of a new license and cancellation of the old one when a car changes owners.

Thus, we find that the actual sales of new cars for the year aggregated 7,340. As New York is the greatest market in the country for high-priced cars, and the branch houses, importers and agents for high-class machines outnumber the medium and

low-priced agencies, it is a conservative estimate that the average price of cars sold is $2,500. Placing the year's sales at the round figure of 7,000, this gives a total volume of business in complete cars alone of $17,500,000. It is entirely out of the question to calculate the money spent in accessories.

Outlook Exceedingly Bright.

Regarding the outlook for business during the coming year, there seems to be but one opinion—that it is better than it ever was and that the volume of sales will be greater by far than ever before. The purchasing public appears to have recovered fully from the influence of the financial depression, and sales during the past Fall and early Winter have been away ahead of sales for a like period at any time in the past. For example, Manager M. J. Budlong, of the Packard branch, says that 400 Packards have been sold through the New York house and that the 1909 output is almost disposed of already. According to W. P. Kennedy, of the Studebaker Company, their business is fully 100 per cent. better than in 1907. Sales have this season continued right up to the end of the year, notwithstanding the proximity of the shows. One promising feature of the New Year's outlook is the increased sales that may be expected as a result of purchases deferred last year owing to general business depression and uncertainty. An indication of the trend of business is the fact that the State registration during the closing months of the year ran 100 a day more than a year ago.

Electric vehicles continue to hold favor as town cars and to supplement the big gasoline limousine and touring car.

In the Commercial Vehicle Field.

During the past year gasoline trucks and delivery wagons have made considerable advance in New York, a field previously recognized as a stronghold of the electric commercial vehicle. Of the twenty-five Packard trucks built and sold during the year, a dozen came to New York, and half of these were taken by the Adams Express Company. Frayer-Miller, Hewitt, and Knox trucks are coming into increased prominence in the streets, together with some Waltham, Rapid, and Lambert machines.

In the electrical field, the Studebaker, General Vehicle and Baker people are most active. It is noteworthy that the Studebaker company purposes to devote its energies in New York City chiefly to pushing its truck business, gradually dropping the electric pleasure carriage trade. Through a corps of special salesmen with an engineering training, it is negotiating with leading concerns whose business is of national and international proportions such as the American Sugar Refining Company. It has been working quietly along new lines, and the results are only beginning to appear, but before the end of the year the local branch expects to be taking orders whose magnitude will surprise the trade. The Baker company anticipates a good business in its new light delivery wagon. After a six months' trial of one of these wagons fitted with express body, the engineer of the American Express Company has strongly recommended the purchase of sixteen of the same model. The General Electric Company, which now owns the General Vehicle Company, formerly the old Vehicle Equipment Company, of Brooklyn, is making careful investigations of the motor truck situation, and is planning a more active campaign with the new models which have been much improved—in fact, almost completely re-designed. The Couple-Gear Company has also entered the field with a local agency.

The tire trade of the Metropolitan district is handled wholly through branch houses which are maintained by all of the leading tire manufacturers of the country and by the Michelin and Continental companies of France and Germany, which now bave American factories.

Changes Among the Agencies.

As usual, many changes have occurred among car agencies during the year, some dealers dropping out, others starting in and still others reorganizing and changing names. Of principal note among those that have quit business are the Garford Motor Car Co., whose business is now handled by Studebaker; the Dragon Automobile Company; A. G. Southworth, who had the Pope lines; the Electric Vehicle Company, which went into receiver's hands; the Rainier Company, also in receiver's hands; the Mercedes Import Company, and the Maja Company, Ltd.; the Palais de l'Automobile, which had the agency for the Delaunay-Belleville, now handled by Brewster & Co.; Archer & Co., who handled the Hotchkiss; J. S. Heller, who had the Zust, now in the hands of a new company called the American Zust Company, with Walter Sykes as president; the McLean Auto Company, which had the Lambert agency; Cincinnati Motor Car Co.; Bouton Motor Co.; Rolls-Royce Import Co.

Altogether, including agencies and garages, there have been forty discontinuances in Manhattan during the year just closed. Against this showing, however, sixty new concerns have been launched, showing a net gain of twenty—which is not at all bad for a panic year. One development of some interest is the opening of an agency for Clement dirigible balloons by Sidney A. Bowman, agent for Clement cars.

Especially notable among the new establishments are the branch houses of the Moon Motor Car Co., of St. Louis, at 2186 Broadway; the Mora Motor Car Co., of Newark, at 1670 Broadway; the De Luke Motor Car Co., of Detroit, at 1633 Broadway; the Babcock Electric Carriage Co., of Buffalo, at 1591 Broadway; the Buick Motor Co., of Flint, Mich., at 1733 Broadway; the Jackson Motor Car Co., of Jackson, Mich., at 1720 Broadway; the Johnson Service Co., of Milwaukee, at 36 East Twentieth street, and the Regal Motor Car Co., of Detroit, at 125 W. Sixty-eighth street. Other important additions are the new local manufacturing concerns, as the Adams Vehicle Co., at 1677 Broadway; Benner Motor Car Co., at the same address; Fulton Motor Car Co., at 370 Gerard avenue; and the Peets Mfg. Co., at 60 W. Forty-third street; also, the new American Automart garage, at 1621 Broadway, the Apthorpe Motor Car Co., with salesroom and garage at 214-18 W. Eighteenth street, and others. Several notable changes have also occurred among prominent dealers, such as the separation of Messrs. Hollander and Tangeman, of the Hol-Tan Co., and the organization by one of the members of the Fiat Automobile Co., formerly controlled by the Hol-Tan Co.; the organization of the Hamilton-Kull Co. to succeed the Kull Automobile Co., and the formation of the Wayne Motor Car Co, of New York to handle the Wayne, formerly sold by the Kull company, and the advent of the Carl H. Page Co. to take the agency for the new Chalmers-Detroit. In losing the Buick agency through the establishment of the Buick branch, the Koehler Sporting Goods Co. gets in its stead the agency for the new E-M-F.

In the ranks of the importers there have also been important changes, as indicated by the entrance during the year of the American Zust Motor Co., at 1989 Broadway; the Benz Auto Import Co., with Jesse Froelich as president; the Delahaye Import Co., at 587 Park avenue; Hotchkiss Import Co., at 1855 Broadway; Isotta Import Co., at 1620 Broadway; Societe des Automobiles and S. P. O. Automobile Co., both at 1966 Broadway, and the Universal Taximeter Cab Co., at 153 E. Fifty-third street, which has just announced the Argyll taxicabs.

Statistics of New York City Trade, January 1, 1909.

MANHATTAN AND THE BRONX.

Branch houses American car factories	30
Agencies for American cars	70
Agencies for foreign cars	39
Local manufacturers of complete cars	7
Total number of garages	120
Electric charging stations in garages	38
Exclusive automobile repair shops	15
Number of taxicab operating companies	44
Branch tire houses and agencies	29
Number of supply dealers	33

BROOKLYN.

Agencies for American cars	40
Number of Garages	60

JANUARY 1, 1908, TO JANUARY 1, 1909.

Estimated number of cars sold in Greater New York	7,344
Estimated aggregate value of cars sold	$17,500,000
New salesrooms and garages opened	60
Concerns discontinued or name changed	40

INDUSTRY'S MAGNITUDE IN CHICAGO ASTONISHING

CHICAGO, Dec. 28.—The magnitude of the motor industry in Chicago is not appreciated until one starts in to review the business of a single year, then it dawns upon him that the Windy City can compare most favorably even with Detroit, the heart of motordom. The comparison may not hold good so far as the construction of motor cars is concerned. Detroit certainly has us there, but it is doubtful if it can outpoint us in the other departments, for there are represented in Chicago more concerns that are allied with the motoring industry than are to be found in the Grand Central Palace this week—makers of motor cars, manufacturers of motor buggies and of sundries, parts and accessories by the score. There are exactly 302 manufacturing concerns in Chicago allied to the motoring industry.

Chicago certainly is the center of the motor buggy manufacturing business, for here are made no fewer than ten different makes of the high-wheelers—the Holsman, the Duer, the Reliable Dayton, the Monitor, the Bendix, the Ranger, the International Harvester, the Black, the Bugmobile and the Chicago Motor Buggy Company's product. Here, too, are found such commercial rigs as the Holsman, the Gifford-Pettit, the Monitor, the Randolph and the Fairbanks-Morse, while in the pleasure car line we have the Diamond T, Silent Knight, Falcon, Lauth-Juergens, Triumph, Monitor, Monarch and Pullman. In the electric line there is the Woods Motor Vehicle Co., while the Jay Motor Co. is experimenting with a steam car.

Chicago's Manufacturing Strength.

Touching on the manufacturing industry as a whole in Chicago, it is discovered there are listed 242 different articles made here, ranging from a big motor car down to insulated wire, each and every one contributing its share toward making this city a motoring metropolis. In the allied branches there are five makers of bodies, five of carbureters, seventeen of wind shields, sixteen of tops, fifteen of castings of all sorts, twelve of motors, two of speedometers and so on down.

Turning to the retail end, it is found there are more than eighty different makes of cars represented—eighty-one to be exact, if the writer counted right—while of these twenty-one are represented here by branch houses. There are eight big supply houses, four of which also act as jobbers, while there are fourteen tire concerns represented here by branch houses and several others have agencies.

Still continuing the census and aided by the telephone directory one finds that this city fairly bristles with public garages, which are as hard to locate as it would be to count the livery stables in the city. Most of them are prosperous enough to have a telephone installed, so there is no reason to question the veracity of the directory which gives 118 motor car garages. Many of them are little affairs—old stores or ancient livery stables remodeled for this purpose, but there are a dozen or so places which could stack up against the best in the land and which have every convenience imaginable and house all the way from 100 to 300 cars each.

Motor Livery Business.

In the same line there are motor livery businesses by the dozen. But few of them are of the first flight, the majority having from one to three or four old cars which are used for the renting business. In addition there are half a dozen stands downtown where cars are ranged alongside the curb for public hire. There are half a dozen concerns which can be dignified by calling them motor liveries, and these half dozen have in service some 100 rigs, of which about seventy-five are taxicabs and the rest touring cars. Chicago likes the taxicabs and would have more of them. It will by spring, at which time it is expected there will be three times as many running as there are now. Only one of the taxicab companies fits the taximeter to the rear wheel, and this, it is said, may be stopped by means of a city ordinance which even now is in course of preparation, it being claimed that instruments so attached are liable to run up false mileage.

Season Slow to Open.

So much for Chicago's strength. Now as to the past year. Inquiry in all the trade centers of the town would seem to indicate that Chicago's experience has been about the same as the other big cities. The financial flurry, as we like to term the panic of last Winter, crimped everyone to start out with, and it was late in the Summer before the buyer came out of his cyclone cellar and sat up and took nourishment. Then he made up for lost time and those dealers who had counted on long vacations in the early fall found themselves so tied down by business that there was no chance of getting away. Those who had had any surplus stock on their hands by September found it no trouble at all to get rid of the cars and 1908 goods were selling well even when the 1909 crop was coming in to the market. As elsewhere those who were selling low-priced and medium-grade cars found themselves busy despite the supposed hard times. It would seem as if those who had figured on buying high-priced cars contented themselves with something cheaper when they found their bank account endangered. They had to have the cars, even if hard times did threaten, and in this many dealers found their salvation.

Big Cars Sell Well.

Still it wasn't a bad year for the big fellows, either, and it is more than probable that on the average there were fifty cars of each of the high-priced makes sold in town, which would make from 350 to 400 cars selling at better than $3,000. Foreign machines did not show up prominently because Chicago is not addicted to the European habit, there being only two makes, the Renault and Berliet, directly represented here. The former has a branch, while the latter is represented by the Berliet Import Co., which has the sales right for the United States.

If one should hazard a guess and say 2,000 cars were sold directly in Chicago this year he would not be far out of the way. There are some 18,000 cars registered in the State and undoubtedly one-third of these hail from Chicago. When the city collected the registration fee it had some 5,500 cars on its list, but this came to an end a year ago last July. This leaves only one way to find Chicago's strength and that is through the city comptroller, who counts noses for the wheel tax. He reports some 5,700 cars, but these do not take in the suburbs, where probably a couple of thousand more cars are located which properly come under a Chicago heading. This would make nearly 7,500 cars for Chicago, which would make it about 2,000 new ones for the past year.

Magnitude of Wholesale Business.

But Chicago dealers have not been solely occupied selling cars locally. Most of the dealers have big territories, some of them running into Iowa, Indiana, Wisconsin and Nebraska, and some even taking in St. Louis. Therefore, in summing up the business of the year that has passed through Chicago this must be taken into account. Then, too, there are big branch houses like the Buick, Ford, Rambler and Maxwell which have been passing out cars at wholesale in vast quantities. One of these concerns is credited with disposing of 1,400 cars altogether through the local branch, so it will be seen that during 1908 Chicago has acted as a clearing house for thousands of cars in this territory.

Chicago, too, is a center for the supply business, and one man who keeps a finger on the motor trade pulse declared the other day that five of the supply houses and the garages in the outlying districts had sold goods that totaled $1,500,000. He figured that these garages combined had done just about as much busi-

ness as did the five supply houses whose business he had reckoned in his estimate.

Chicago's motor row is changing every month. Slowly but surely it is moving southward, while the cracks and crannies in the middle are being filled up. Wabash avenue is nearly deserted. The Studebaker is camped there still and so is the Orient, but the Chalmers-Detroit, Lozier and Autocar as represented by the Levy & Hipple Company, is about to join the Michigan avenue colony, while the Dorris already is there. Few new buildings have gone up, though. The Levy & Hipple Company is building near the Stoddard-Dayton agency, the Knox has just moved into a new place between the Buick and Rambler, while the Motor Car Supply Co. is about ready to take possession of a handsome two-story structure a few doors south of its present location. The Dorris is in a new building just south of Eighteenth street, while the new Oldsmobile branch is in a recently-built establishment just north of Walden Shaw's. The Swinehart tire, too, has a new place of its own.

Changes on the Row.

Kaleidoscopic changes, though, have taken place along the row. Some have dropped out and others have come in, so if anything Chicago has gained rather than lost in strength. Of the twenty-one branches now here nine of them have come in during the present year. Palmer & Singer, Oldsmobile, Locomotive, Renault, Meteor, Velie, Babcock, Austin, and the Overland are new. Of these the Locomotive, Overland, Oldsmobile and Kissel have switched from agencies. The Velic is just locating, having taken the store now occupied by the Packard agency, which intends moving to the south end of the row next May. The Stanley is coming in with a branch for 1909.

Agency changes have switched the Premier to Webb Jay, who gave up the Kissel. Shaw gave up the Premier, Reo and Locomobile to handle the Berliet and Thomas, the latter transferred from Coey, who took up the de Luxe. The Reo went to the Reo Automobile Co., while the Chalmers switched from a branch to an agency when it dropped the Thomas. The Bird-Sykes Co. took the Matheson when the Palmer & Singer branch opened with the Palmer & Singer line. Githens landed the E-M-F when the Olds people decided to have a branch Branstetter as representing the Kissel.

New cars that came into town during the year include the E-M-F, P & S, Gyroscope, Waverley, Regal, Brownickar, Austin, French Berliet, Midland, Falcon, Oakland, Pittsburg Six and Velie, while those which have dropped out include the American, Marion, Wayne, Cleveland and National. Of these the Marion and Wayne have gone out of business.

Row Moving South.

Apropos of this tendency on the part of the row to shift to the south where the rents are cheaper, it is stated that some time next Spring there will be a migration on the part of some of the big dealers to the district around Twenty-second street. It is said that some of the representatives of the high-powered cars believe they could establish a colony on Indiana avenue or Wabash avenue near Twenty-first street and do well. It is believe, though, Indiana avenue would be best suited for the purpose. That's where the new Stanley branch is being constructed. Walden Shaw is one block west from this, facing on Michigan avenue. Next door to Shaw is the Oldsmobile branch. The Packard agency is going to move in the spring, but just where it is not stated. At the present time it is on Michigan avenue just south of Sixteenth street, but that its intentions in the matter are sincere is shown by the fact that it has leased its present quarters to the new Velie branch. It is hinted, but the hint has not been confirmed, that the Packard people are looking with favor upon a site still farther south.

The commercial proposition is gaining a strong hold in this city. At first it was slow work because of the condition of the streets upon which business traffic is permitted. Dealers in business rigs, however, say this is no longer so now, because of the wheel tax which the city has imposed and which it already is collecting. This reaches a vast sum, about $700,000, and it is the intention of the authorities to devote it all to the improvement and maintenance of the city streets. Considerable work along this line already has been done, but the job is one of such a vast magnitude that one does not appreciate what has been accomplished. Another year ought to make a difference and by that time the demand for commercial motor wagons ought to be much better.

Many Commercial Rigs.

A conservative estimate of the number of commercial rigs in operation on the city streets at the present time places it at 250 machines, ranging in size from the fleet of little Orients used by Stevens to the big 3 and 5-ton trucks working for the packers. The trucks have made a particularly strong impression at the stock yards and Swift and Morris, two of the leading packers, declare that one of their motor trucks can do the work of five horse-drawn rigs. An instance is cited where one of the Reliance 3-ton trucks working for Morris started in at 7 o'clock in the morning to transport seventy-five tierces of lard, each weighing 450 pounds, to a point six miles away. This represented 33,750 pounds, but the truck was through its work by 3:30 o'clock in the afternoon. Another instance is given where a four-cylinder truck carried 200 cases of beer in one load for Schoenhofen.

As showing the diversified interests using commercial motor trucks in Chicago, the list is made up of such concerns as Montgomery Ward & Co., the big mail order house, one of the earliest of Chicago houses to take up the motor truck; A. H. Revell & Co., the furniture house, which also broke into the game early; the McAvoy and Schoenhofen breweries, Sears, Roebuck & Co., another mail order house; the Price Baking Powder Co., the *Daily News*, Stevens & Co., Frank E. Scott, the transfer man; the David Parker Moving Co., the Harbor Van Co., the Wisconsin Tea Canning Co., Anglo-American Provision Co., Anderson Brothers Teaming Co., the Valvoline Oil Co., Omaha Packing Co., National Lead Co., the public library, the National Casket Co., Lyon & Healy and the Cable Piano Co.

Representatives of these commercial trucks say that their chief difficulty is not with the streets of Chicago, but with the drivers. While there are some good men piloting these big rigs the demand is greater than the supply. It is easy enough to get drivers, they say, but the most of them lack experience and ability. As soon as it is possible to man the commercial rigs properly then the commercial proposition in Chicago will be a good one.

Electric Growing in Popularity.

The electric is gaining a good foothold here because of the many miles of magnificent boulevards, many of them asphalt, affording an easy and luxurious way for the society woman to drive into the business district. Many of the women make a practice of driving downtown morning and evening, carrying their husbands to and from business. The men, too, like the electrics, and many of the electrics are piloted by business men who enjoy the leisurely pace. Especially is this so this Winter when the warm coupé bodies make riding in an electric a luxury. And one travels more leisurely in inclement weather.

Seven makes of electric rigs are now represented in Chicago, two of them branches, the Woods and the Babcock. The Woods factory also is here and the plant is pushed to its fullest capacity to keep up with orders. In addition to these two the Rausch & Lang, Detroit, Baker, Columbus and Waverley are represented by agencies, and it is said it is the intention of the Fritschle to open up here in the Spring.

Statistics From Chicago.

Estimated number of cars sold from Chicago, wholesale and retail	10,000
Number of makes represented	81
Number of branches	21
Number of agencies	66
Number of garages	118
Number of supply houses	8
Number of manufacturing concerns	302
Number of articles manufactured	243
Number of motor buggy makers	10

BOSTON IS NEW ENGLAND'S AUTO HUB

BOSTON, MASS., Dec. 28.—When statistics are given out dealing with motor cars and the motor industry they run into large figures. Sometimes these are really surprising, and it takes much argument to convince the ordinary person and even then with facts and figures there still remains an air of doubt. So when it is said that during the past year—allowing a little more than since the first of January, of course; or to go back to the beginning of the 1908 selling season—that some 3,500 cars were sold in Boston aggregating something like $7,000,000, placing the average at $2,000 a car, the statement is apt to meet with skepticism. Yet that seems to be a reasonable, conservative estimate. Of course, no one expects that each dealer in Boston is going to tell just how many cars he sold. In fact, this air of mystery which surrounds the sales of motor cars is one of the novel things connected with the business. However, there is a way of striking averages which may give some idea of the sales. When it is considered that something like seventy cars were represented in Boston during the year, that would mean an average of fifty cars sold by each dealer

17,000 Cars Registered.

There are 17,000 cars registered in the State. Allow 3,000 as being reregistrations of one owner to another and there is left 14,000. Cut the latter number in two and grant that 7,000 are machines owned by men a year ago; that leaves another 7,000 as being approximately new cars bought within a year. Now there are nearly 3,000,000 people in the Bay State and of that number more than one-third may be found within a few miles of Boston. The eastern portion of the State is, of course, the more thickly settled, so the statement is not too broad to claim that two-thirds of the people live within a radius of twenty-five miles of the Hub. Is it too much then to claim that half of the motor cars sold in the State were delivered by Boston dealers? Certainly not.

Sixty-Five Makes Represented.

There are now in Boston representatives of about sixty-five motor cars. Of these fourteen are branches, while the other fifty-one are represented by thirty-one agents selling on commission, some having two or three cars. All things considered the past year was not a very bad one despite the cry of panic and hard times. There were not so many changes when it is considered that there are so many agencies in Boston. The new cars that come here were not numerous, and those that dropped out or changed hands did not create any great stir.

When the situation is really analyzed it will be found that the new arrivals balance what changes and withdrawals have been made during the year, leaving the conditions numerically about the same, but the industry in a more healthy condition.

Boston should be a very good field for the electric vehicle. Still, there is not the steady growth in these machines that there should be. The city is level, the streets are well kept; there are plenty of places to get batteries recharged, yet the number of electrics seen on the streets is not enough to make one accustomed to seeing them. There are agencies here for the Studebaker, Columbia, Babcock, Baker, Bailey and Columbus and more attention is being given to their sale now.

The Commercial Situation.

Commercially, Boston is taking kindly to the horseless vehicle. To stand now and watch traffic in any one of the busy streets will show an entirely different scene than was presented a year ago. There are all sorts of commercial vehicles in use now. Caterers, florists, hospitals, express companies, furniture men, dry goods stores, banks and even a large undertaking company has within a few weeks joined the list, to say nothing of the dozens of trucks now used by the Edison Electric Co. and the New England Telephone Co. It makes a really striking array and speaks well for the men who have been selling these vehicles. There are represented here, among others, the Rapid, Logan, Knox, Maxwell, Packard, Frayer-Miller, and within a short time there will be some more new ones.

The one thing in the industry that has attracted attention in this city above all else recently is the taxicab service. Beginning with a couple of cabs put in some months ago by E. P. Blake, of the Jackson, there suddenly came into being during the summer companies using dozens of the little vehicles. One of the companies put in a lot of Thomas cabs, and the other put in Berliets. There were also put in some Atlas cabs. Then some of the cabmen purchased one, two or three to make some sort of a showing as they saw their trade falling off. So now there are perhaps about seventy-five of them in the city and the end is not yet. Whether the taxicab business will be overdone is a question that some of the men who have followed the motor game for years are wondering at now. The city is not large and it does not take long to cover it from north to south and east to west, and with a system of tunnels it is easy to make connections in a short time, so with too many of the taxicabs there is apt to be a falling off in receipts. They will be patronized much for some time because of the novelty, naturally, but eventually they will get down to a basis where the dividends on the capital invested may not be as large as expected.

Million Invested in Real Estate.

There is more than $1,000,000 invested in the real estate that houses the motor car agencies alone, not to mention all the buildings now occupied by men affiliated with the industry in the repairing, tires and accessory line. Some of these buildings were constructed especially for the motor industry. There is, for example, the Motor Mart in Park square, in which are housed the Packard, Cadillac, Marmon, American, Buick, Chadwick, Speedwell and a number of other cars. It is a large circular structure right at the very door of the trade, being a sort of a hub from which the spokes go to the west. The greater number of garages is within a section 1 mile long by 1-4 mile wide. These buildings, it must be understood, were not all erected during the past year, but as this is perhaps the first comprehensive review of conditions in Boston it is not out of place to mention them.

Naturally with so many cars in Boston, and all New England to draw upon practically, the tire branches here are more than mere small stores for selling a few sizes. Each concern has an up-to-date branch where all the sizes are kept in stock ready to be sold or shipped quickly anywhere. This means very large quarters, of course. The Diamond, Goodrich, Goodyear, Firestone, Fisk, Morgan & Wright, Continental, Hartford, Dunlop and G & J have long been established here. The Michelin, Dow and Federal are newcomers in the fold here.

It is not to be wondered at that the accessory people are very strongly intrenched in Boston. All the speedometers are represented here; Gray & Davis have just established a Boston office for lamps; the many kinds of shock absorbers have their own representatives, until the owner of a motor car may purchase anything needed and without being forced to go to any one place and held down to one article of some accessory. With all these affiliated branches counted in it proves there are millions in the motor industry in this city alone, just how many is problematical, but $10,000,000 does not seem an excessive figure.

Statistics From Boston.

Estimated capital invested	$10,000,000
Total sales in 1908	$7,000,000
Cars sold	3,500
Makes represented	65
Agencies	31
Branches	14
New branches opened	1
New agencies	8
Branches discontinued	1
Agencies discontinued	13
Taxicabs running	75
Supply houses	52
Miscellaneous concerns	45
Garages	20

CALIFORNIA APPRECIATES THE AUTOMOBILE

SAN FRANCISCO, CAL., Dec. 26.—"The past season, though a trying one at the beginning, has in the end been one of the best in the history of the motor car industry in California. The season that we are just about to open will, in my opinion, surpass anything that we have ever had out here.

This brief summary, made by one of the prominent motor car agents of this city, gives a good picture of the situation in this State; in fact, it may be applied truthfully to the whole Pacific coast, if reports brought to this city by the general traveling representatives of the manufacturers are correct. Never before has the outlook in this State been brighter for the motor car men. The financial stress has passed away, and money appears to be plentiful, although it is still true people are holding onto it a little nervously. The peculiarly local conditions affecting San Francisco as a result of the great disaster of 1906 are rapidly straightening themselves out; merchants and business men now know where they stand, and are able to judge their affairs accordingly. The agriculturists of the State, and its horticulturists, are much happier than they were a year ago, for the rains have come that were lacking then. The prosperity of these two great industries of the Golden State means the prosperity of all. And, too, the prosperity of the farmer and the fruit man and the man of the country generally assumes an importance this year that it has never had before. The reason for this is the introduction into the motor car market of the new brands of low-priced cars, which will be turned out by the thousands, and which must in the nature of things find a good part of their market in the country. So far as California is concerned, there seems to be no doubt but that the country will do what is expected of it, and maybe demand more than the manufacturers can supply.

Year a Healthful One.

All things considered, the past year has been an excellent one for the motor car men of this city and State. The start was bad indeed, for the financial depression that put itself like a pall over the country in the fall of 1907 affected California no less than it did the East and Middle West. Perhaps, indeed, the effects were felt a little more out here because of local conditions. San Francisco was just pulling itself out of the disaster of 1906 when in May, 1907, came the great street-car strike, which resulted in the temporary destruction of San Francisco's retail business. Just as this was settled and business was resuming its normal course, there came the financial crash that shut the motor car market down as tight as a drum. Those were bad days for the agents who did not have the strongest financial backing, and it was not long before a dozen or more of them closed their doors, some of them able to pay their bills first and some of them not. It was a weeding out of the mushroom firms.

Gradually, however, with the disappearance of the paper money issued by the clearing houses and the return of confidence, things began to brighten, and before the Summer was well along the motor car market was very appreciably improved. The business of the various houses, while not, perhaps, approaching the heavy volume of the previous season, was still sufficient to float the agents along very comfortably, and in some instances cars that have won popular favor have not been obtainable in sufficiently large quantities to meet the demand. For example, Charles S. Howard, the local representative of the Buick car, has been at the factory at Flint, Mich., for several weeks trying to get some more cars for his territory. Finding telegrams availed him nothing, he packed up and went East with the determination to camp right at the factory until he got what he wanted. Meanwhile the floor of his salesroom here is practically empty, and of the particular model that he wants he cannot get enough.

Scramble to Fill Orders.

Other local agents have found themselves practically in the same position. The few companies that had their 1909 models to show two or three months ago reaped a harvest, while those whose cars arrived late suffered accordingly. Many of them, however, with well-known cars, accumulated a goodly number of orders, and they are now filling these from the shipments that are coming through. California, differing from many sections of the country, is a year-around State. There never is a week that motoring is not pleasant, and for business purposes the motor car is used every day in the year. This is especially true in San Francisco, where the transportation companies have not yet entirely straightened themselves out after the disaster, and getting about rapidly is consequently still a little slow. Motor car buying in California, therefore, never stops for weather reasons. The coming season certainly will be no exception. The reports of the motor vehicle department of the secretary of State's office show that from December 1, 1907, to the same date this year almost 5,500 individual motor vehicle licenses were issued.

Fine New Buildings.

The great fire of 1906 destroyed every motor car salesroom in the city. Since that time practically every dealer in the city has had his salesroom in some kind of a temporary shack, paying exorbitant rates of insurance and constantly in dread of fires, several having been wiped out by flames. This situation is now being remedied rapidly. The Winton Motor Carriage Co., when it established a branch here a year ago, put up a handsome brick and concrete building on beautiful Van Ness avenue which not only houses its own branch, but also two other motor car firms and a tire house. This building cost about $65,000. The White company is now erecting what will undoubtedly be one of the finest garages and salesrooms in the city. It covers a large area, with two stories, and will cost more than $125,000. The Studebaker Brothers Co., of California, has erected in the general wholesale district of the city a seven-story building that must represent an investment of a third of a million.

The Franklin and Pope-Hartford agencies, the Fisk Rubber Co., the Renault, the Oakland Motor Car Co., the Winton and the Diamond Rubber Co. are all now housed in permanent structures, and contracts have been let for several other fireproof buildings, each one of which will house two or three or more motor firms. The building of the Diamond Rubber Co., in the down-town wholesale district not far from the Studebaker house, is an enormous place, representing a very large investment.

Foreign Car Succeeds.

An interesting feature of the San Francisco market has been the success scored by the only foreign car represented here. This is the Renault. A branch was installed here just about a year ago by Paul Lacroix, head of the firm in the United States, and left in charge of a young French ex-army officer, Rene Marx. During that time the branch has sold more than a dozen of the high-grade foreign machines, the purchasers being numbered among the wealthy men and women of the city. In some cases the car has been purchased here and delivery taken in Paris, the new owners touring the continent before returning here. A taximeter cab company has been organized which has already contracted for a number of Renault taxicabs, and it is understood that these will be in actual service within a month. San Francisco at the present time has no taxicab service, and there seems to be no doubt that if the financiers of the project can see their way clear to impose moderate charges, the little cabs will be immensely popular here. Another taxicab company, it is understood, is also in course of organization which plans to use the Thomas taxicab, which car is well known on the "Coast."

Statistics From San Francisco.

Cars sold in California	5,500
Number of branch houses in city	8
Number of motor car dealers	36
Number of makes of cars represented	14
Number of tire agencies	10
Number of supply houses	

AUTOS ARE A NECESSITY IN THE NATION'S CAPITAL

WASHINGTON, D. C., Dec. 28.—There are a number of things that serve to make the year 1908 the most remarkable in the history of the local trade. While the number of cars sold probably was not as great as during the preceding year, the average cost of this year's cars was greater than last year, demonstrating that the demand has been for the high-priced machines. Another striking feature of the year's progress was the unusual number of new agencies that were placed during the year, and especially during the latter part of the present season. Sixteen different makes of cars that have not heretofore been represented on this market were placed with different dealers during the year, as follows: Matheson and Oldsmobile, Pope Automobile Co. of Washington; Brush and Oakland, Brush-Nichols Co.: Stoddard-Dayton and Babcock, L. P. Dorsett Co.; Lozier and Detroit, Dupont garage; Woods H. Carnell Wilson & Brother; Overland, Dewey garage; Premier, Lester D. Moore, Jr.; Chalmers-Detroit, Motor Car Co.; E-M-F, Studebaker, Commercial Automobile and Supply Co.; Regal, George W. Wells. The Luttrell Co. discontinued the Locomobile agency, which was taken by the Belmont garage; the Dupont Garage Co. dropped the Corbin; H. Cornell Wilson & Brother gave up the Elmore agency, which Charles E. Myers took up. This is believed to be about all the changes that occurred during the year.

There are nineteen dealers in the capital city who handle forty-one different makes of cars, thirty-four of which are gasoline and seven electric. It is difficult to figure the amount of money invested in buildings for sales rooms, garages, etc., but it has been estimated at $2,000,000.

Electrics Hold Their Own.

Electric vehicles about held their own during the year, although during the fag end of the season the demand for them was greatly improved. Incidentally it might be mentioned that 1909 promises to be the best year for electrics that the local trade ever has known.

Commercial cars made great strides during the year and this branch of the business is receiving more and more attention at the hands of the dealers, as they are beginning to realize that commercial cars are reaching a point of perfection that insures them a steady and ever-increasing sale. The Federal Government is paying a great deal of attention to the commercial car, and the number owned by Uncle Sam has been considerably augemented since the beginning of the year.

New Garages Built.

Half a dozen new garages were erected during the year and this branch of business is rapidly getting down to a more solid business basis. In former years the garage business was deemed a losing venture in Washington, but this was largely due to the fact that the business was not watched closely enough. There were numerous drains that served to swallow up the profits, but this condition of affairs is being rapidly improved and the garage business may now be said to be on a pretty good basis.

Taxicabs were placed here for the first time this year and they leaped into instant favor. At least a hundred of them are now plying the streets, with every indication of a shortage, and it will be difficult to say just how many more would fill the demand.

Statistics From Washington.

Number of motor car dealers	19
Makes of gasoline cars represented	34
Makes of electrics represented	7
Approximate number of cars sold in 1908	275
Number of tire agencies	10
Number of supply houses	2
Number of dealers handling supplies	6
Approximate capital invested in all branches of industry, including garages	$2,000,000

DENVERITES BELIEVE IN PRESENT AND FUTURE AUTOING

DENVER, COL., Dec. 27.—Name for me a city in the United States of America with a population of 240,000 whose people expended more than two and a quarter million dollars for motor cars during the year 1908, then Denver will take second place in that class. Denver did that, and more. Like every other modern innovation that means progress and betterment of mankind, Denver has taken hold of the motor car with a vim, and having the wealth behind it, the result is going to be that it will never be distanced in the number of cars that will be used nor in the average value of these cars.

It took 1,550 cars—gasoline, steam and electric motors—to satisfy the demand of its citizens. The number is going to be far greater during 1909, for the great agricultural district, growing greater every year, and the mineral, oil and other resources of the State and the contiguous territory of which Denver is the center, expanding with astonishing rapidity, is going to pour into the banks of this city such a flood of the purchaseable necessity that the business of the motor car dealers here will be an enviable one.

Fifty-eight Makes Represented.

Thirty-one agencies of motor cars presented fifty-eight different makes of machines for the choice of the purchasers. These dealers—including two branch houses—sold a total of 1,550 cars for an approximate amount of $3,250,000. Of the totals Denver alone took two-thirds of the cars and expended seven-tenths of the purchase price. The balance went over the State and to other sections taken care of by the agencies and branches. Of the total of 1,270 gasoline cars sold the price ranged from $650 to $8,000. About 36 per cent. of the sales were of cars ranging in price from $1,200 to $1,500.

The operators and owners of some thirty-odd public garages have each a large force of men steadily kept on the payroll. At these places the majority of the cars are kept, the new private garage at the residence of the owner not having grown very extensively, rather has it been a change of the former horse and carriage house into a garage, and these changes have been numerous, adding much to the health and cleanliness of the residence sections particularly.

While Denver has been a splendid patron of the motor car made in various sections of the country, it is crowding this avenue of progress some by coming in with two factories of its own. One, a gasoline motor car, the Colburn, had its first of sales to record this year.

Fritchie Electric Made in Denver.

The Fritchie Automobile and Battery Co. product, one of which recently completed a run from Lincoln, Neb., to Washington, D. C. This factory filled orders for sixty-five cars during the year, more than half of which have been delivered to Denverites and the balance distributed from the Atlantic to the Pacific. These two factories show a capital investment of $300,000, and this added to the moneys invested in the agencies, the branches—Studebaker and Ford—the garages, the supply houses, tire agencies and motor car livery establishments, bring the grand total invested in the industry up to a million and a half.

Statistics From Denver.

Capital invested	$1,500,000
Cars sold in 1908	1,550
Number of agencies	31
Different makes represented	58
Number of tire agencies	13
Number of supply houses	3
Number of public garages	30
Number of factories	2

CLUBS PREPARE FOR WORK OF NEW YEAR

QUAKERITES DON'T WANT CLEAN SCORES.

PHILADELPHIA, Dec. 28.—So many "unofficial" wails have arisen over the impossibility of covering the mountain controls of the New Year's endurance run of the Quaker City Motor Club on a 20-mile-an-hour basis, that the contest committee last week "unofficially" discussed the situation and decided, again "unofficially," to pay no attention to them, on the ground that all would suffer alikc, and that the committee didn't want a superfluity of clean road scores anyway. At the same time, as a matter of justice, it was decided, in view of the extremely narrow road, especially in the mountains, that if a sound car is held up by a broken-down car at one of these narrow places and can't get around, the observer shall "take time out," which will be allowed in reckoning up penalties at the end of each day.

Since last week's heavy snowstorm, there have been many misgivings over the situation, and not a few entrants have sent their cars over the route. Two of them, the Acme and the Stoddard-Dayton, went over the first day's route to Wilkes-Barre and were forced to "buck" drifts for miles on that portion from Stroudsburg to within a few miles of Wilkes-Barre. They were nearly twelve hours on the road and, had the contest been on, would have accumulated upward of 200 demerits each. Another storm before the start will make things decidedly interesting to cars and occupants alike, althougb the members of the Monroe County Automobile Association have volunteered to get out and break the roads in such an event.

Twenty-four cars have been entered up to date with two days' mails yet to hear from. They are: Stoddard-Dayton, Matheson and Mitchell, three each; Winton, Franklin, Maxwell and Cadillac, two each; Peerless, Acme, Studebaker, Elmore, Oldsmobile, Buick and Rambler, one each.

Over the "automobilists' midday lunch" at the Walton there have been many challenges and acceptances for dual combats between various cars, until on Friday last, Manager W. C. Longstreth, the local Maxwell manager, posted $500 and issued a defi to any other entrant of a $2,000-or-under car who thought his machine would total fewer penalties than the Maxwell to cover the amount. The Automobile Sales Corporation, which entered the Cadillacs, has accommodated Longstreth, and there is at least one other that will follow suit.

DENVER MOTOR CLUB IS PROSPERING.

DENVER, Dec. 28.—Two agreeable surprises were sprung upon the members of the Denver Motor Club at the annual meeting when President Ralph W. Smith announced that a downtown clubhouse and also a country clubhouse had been secured for the coming year. The downtown club is at 1407 Cleveland place, and possession of this house was taken the day before Christmas. The new location is an ideal one for a motor club, as it is convenient to the business part of town, and the clubhouse being situated where four streets converge, the members will have ample space to park their cars while visiting the clubhouse. It is also only a short distance from Broadway, which is the automobile row of Denver, and garage facilities will be ample. In addition to these new club quarters, the members of the Denver Motor Club will be granted all the privileges of thc clubhouse at Overland Park, seven miles south of Denver.

With these two clubhouses the Denver Motor Club will be in a position to entertain the Glidden tourists next Summer in a befitting manner, and already preparations are being made.

The annual election of officers for the ensuing year was as follows: President, Ralph W. Smith; vice-president, William D. Nash; secretary, Frank England; treasurer, C. P. Allen: board of governors, S. D. Hopkins, George Tritch, J. Nicoll Vroom, E. F. Dean, Ralph L. Taylor, W. H. Sharpley, and the above mentioned officers.

BUFFALO CLUB WORKS FOR MEMBERS.

BUFFALO, Dec. 28.—The annual election of officers of the Automobile Club of Buffalo resulted in John M. Satterfield being named as president; Laurens H. Enos, vice-president; Harry Thorpe Vars, treasurer, and Dai H. Lewis, secretary. Mr. Satterfield was vice-president and chairman of the Good Roads committee of the club last year.

The report of the retiring president, Frank B. Hower, showed that the expenditures of the year had been heavy, including the promotion of the boulevard from Buffalo to Niagara Falls, and also in connection with fighting thc proposed municipal ordinance taxing automobiles $5 a year; $565 of the club funds were swallowed up in this and $534.83 was expended in surveying and planning the boulevard. An additional $315 went toward starting the club bulletin.

The membership to date was reported at 1,525, a gain of 398 during the year.

The grievance committee reported that of the 66 arrests for speeding during the year only seven were members of the club.

The boulevard committee submitted a report declaring for the laying out of a boulevard from this city to the Falls, starting at Delaware Park and continuing along Ellicott creek, the Erie canal, Sawyers creek, Bergholtz creek and Cayuga creek, terminating opposite the Niagara Power Company's plant. A committee of five lawyers has been appointed to draw up a bill to be presented in the Legislaturc authorizing the appointment of a commission, which will be empowcred to create parks and boulevards leading to the State Park at Niagara Falls.

President William H. Hotchkiss, of the A. A. A., delivered an address explaining the work and aims of the National organization.

Retiring Prcsident Hower was presented with a cut glass punch bowl by his fellow members.

CAMDEN, N. J., NOW AN AUTO CLUB CENTER.

CAMDEN, N. J., Dec. 28.—One of the most enterprising automobile clubs that the State of New Jersey can boast is the new organization known as the Camden Motor Club. Its membership is now close to fifty and every member is a hustler, the work of posting all the principal highways in the western part of the State now being carried out rapidly, while the club will also lend every effort toward the passing of more favorable legislation this Winter. The custom of a carrying a large letter C on their cars has been adopted by the members, and the club is beginning to make its influence felt to a constantly increasing extent. The officers are: President, Dr. H. H. Grace; vice-president, William L. Hurley; secretary and treasurer, G. E. Rhedemcyer. The law committee is composed of the Hon. J. Willard Morgan, Norman Grey and John O. Wilson, while the highway committee is composed of J. T. Dorrance, Frank L. Starr and Harry E. Bodine.

A. C. MARYLAND WANTS GARAGE TIMING SYSTEM.

BALTIMORE, Dec. 28.—Unless Baltimore garage proprietors put in proper timing systems, thc Automobile Club of Maryland will propose a city ordinance compelling them to do so. This action on the part of the cluh members was taken in consequence of numerous instances of "joy riding" and the taking of cars by chauffeurs without the consent of owners.

The club, by resolution, commended Oscar G. Murray, president of the Baltimore & Ohio Railroad Company, for his prosecution of James L. Hild, his chauffeur, who took out Mr. Murray's car without consent. The ride, as stated, ended in the death of one of the riders and the smashing of the machine.

Accidents in Baltimore recently have been entirely too numerous, and the public is inclined to class innocent with guilty.

MASSACHUSETTS COMMISSION SUPPLIES STATISTICS

BOSTON, Dec. 28.—Before deciding to recommend to Massachusetts and the New England States for adoption as a part of a uniform automobile law, a graded scale of registration fees based on horsepower, the Massachusetts Highway Commission made some very careful calculations of the relative cost of registration, liability insurance and tires. The horsepower plan was adopted as the best measure which would represent cost, speed and weight, or the wearing effect of an automobile on the roads. As the registration fees go into the State treasury for use in road maintenance, each fee represents the contribution of the automobilist towards good roads, which are perhaps the most important item in his enjoyment of the motor car.

Looking at it in this way the commission has figured out that on a horsepower basis the automobilist will be required to pay for good roads only less than one-fourth what he pays for liability insurance, which is also graded according to the horsepower of the car, and one-tenth what he pays for tires. Furthermore, by contributing to the improvement of the roads the motorist will greatly reduce his tire cost. The commission has compiled detailed figures on this subject and has found that for a 10-horsepower car the registration fee would be $5. the liability insurance cost $32 and the tire cost $71.44. On a basis of 3,500 miles traveled, the average life of a tire, the commission figures the cost of registration for a 10-horsepower car at .0014 cents a mile, of insurance at .0091 cent a mile and of tires at .0204 cent a mile. On a 5,000-mile basis, the maximum life of a tire, the figures are .001 for registration, .0064 for insurance and .0143 for tires. For a 40-horsepower car the registration fee is figured at $20, the cost of liability insurance $80 and the cost of tires $198.58. The relative cost per mile on a 3,500-mile basis would be .0057 for registration, .0228 for insurance and .0557 for tires. On a 5,000-mile basis the corresponding figures are .004, .0160 and .0397.

The commission also has some interesting figures to back up the inclusion in the new law of the Massachusetts plan of investigating accidents and punishing reckless and other improper driving. These figures show that last Summer there were 18,000 automobiles registered in Massachusetts and in the three Summer months there were 280 collisions in which automobiles were concerned. Although the number of accidents was larger than for the corresponding period of 1907, the number of people injured was one-third less, the figures for 1908 being 222 against 313 for 1907. The number of fatalities was reduced more than two-thirds, the figures for 1907 being 41 against 13 this year. This, the commission concludes, shows a reduction in reckless driving in Massachusetts.

THE LINCOLN MEMORIAL HIGHWAY.

YORK, PA., Dec. 28.—That the Lincoln Memorial Highway bill fathered by Congressman D. F. Lafean, of York, may pass Congress at its present session is the belief of Senator Philander C. Knox, who presented the measure in the Senate. Mr. Knox is greatly interested in the proposed improvements. He stated that he had talked with a number of Senators about the project, and finds a surprising sentiment in favor of it. This is by no means confined to the Senators in the States in the region through which the proposed highway would pass. Senators in the far West have told Mr. Knox that they are for the bill and would like to see it become a law.

In the case of the proposed highway from Washington to Gettysburg, strong reasons of sentiment give the project support.

GOOD ROADS AND AUTOS, BOON COMPANIONS.

TRENTON, N. J., Dec. 26.—The report of Road Commissioner Frederick Gilkyson to the Governor to-day will be of interest to autoists in view of the great fairness of his contention, that while automobiles rip up the road, they influence for good roads in a manner that cannot be denied. The report goes on to say that despite the advanced state of road building, it is far from perfect, and experiments now going on in Jersey will have much to do with the future of road building. In repair work the Commissioner points out that too much care cannot be taken to "scarify" the road after it is resurfaced, and he insists upon the removal of all foreign substances before adding new stone. After the stone is applied it is then important to apply a competent binder before tolling.

GRAND PRIX OF FRANCE SEEMS TO BE DOOMED

PARIS, Dec. 24.—Thirty-three cars are needed, and needed within the next week, to make the French Grand Prix possible. At present the total entries are seven in number, the cars supplied being one Guillemin Le Gui, three Cottin-Desgouttes and three Mors. The Porthos has given intimation that three of their cars will be entered, but until the cash is forthcoming the Sporting Commission refuses to take any notice of the entry. Thirty-three cars never have been obtained within seven days for any European race, and it is absolutely certain that the number will not be forthcoming for the 1909 speed test originally scheduled for the month of July in Chateauland. So poor are the prospects that the Anjou committee, which undertook to raise a subvention of $20,000, has given intimation that those having contributed to the amount should carefully preserve their receipts in provision of a reimbursement.

It might be imagined that as the Grand Prix is a considerable source of profit to the club, there would be an effort on the part of the organizers to maintain it. But no intervention of this nature is likely to be found, for the simple reason that the club and the car builders are one and the same person. The eight members of the Racing Board represent six of the French firms having the greatest interest in and being the strongest supporters of racing; with these having unanimously decided to abstain from racing, there is no hope of the Grand Prix being carried through.

It has not yet been decided what will be done with the other races announced in various parts of Europe, the most important of which are the Ardennes in Belgium and Brescia in Italy. The probability is that they will all have to be dropped for lack of entries, and that 1909 will thus be a sportless year, so far as Europe is concerned. England finds it utterly impossible to hold a race; Germany has no pretentions towards a speed test; Italy would like to repeat the Brescia events of this year, but will find it exceedingly difficult to do so with no large firms building cars; Belgium announces its Ardennes meet, but has so little hope of securing entries of genuine racing cars that arrangements have already been made for replacing the speed test by a touring car competition. As the aeroplane will come prominently before the public as a sport during the year 1909, it is very probable that when automobile constructors come back to road races in 1910, as promised, there will be nobody to take any interest in their performances.

PERCY OWEN, BRIARCLIFF CHAIRMAN.

In the opinion of those interested in racing, there is now probability that a second race for the Briarcliff trophy will take place next Spring in the vicinity of New York City. On Monday last a meeting of the committee of manufacturers interested in the event was held, at which Percy Owen, well known as one of the pioneer drivers of racing cars, was selected as the chairman. It is understood that C. F. Wyckoff, the temporary chairman, asked to be relieved of his duties.

Sidney B. Bowman, Joseph S. Josephs and H. A. Lozier have been designated as a finance committee, and the Wagner-Field Company will take care of the secretarial work.

Of the eleven representatives present at the meeting, seven definitely announced their intention of entering at least one car in the contest. As to whether the rules have been definitely and finally decided upon without any further revision will await the decision of Walter M. Law, the trophy donor, as to his consent in making the event for what must be considered restricted racing cars, instead of touring cars as originally planned.

LATEST RULING OF COLLECTOR OF CUSTOMS.

WASHINGTON, D. C., Dec. 28.—The Collector of Customs at New York has been advised that the regulations of the Treasury Department of November 27, 1907, providing for the allowance of drawback on automobiles manufactured by Brewster & Co., of New York, with the use of imported parts and materials, have been extended to cover the exportation of automobiles manufactured by the members of the Association of Licensed Automobile Manufacturers, with the use of imported parts, in accordance with their sworn statement, dated September 23, 1908. This statement is now on file in the office of the Collector, together with a list of the members of the association.

The regulations provide, however, that no drawback is to be allowed on horns, lamps, odometers and other attachments which may be readily detached from the automobile, and which do not form a permanent part thereof.

LATE NEWS FROM TIRETOWN.

AKRON, O., Dec. 28.—The new tire on which Frank A. Seiberling, of the Goodyear Tire & Rubber Company, has been granted, is described as a sort of hybrid between a solid and pneumatic. It is designed to be used on both pleasure cars and trucks, and will be constructed in different sizes and thicknesses. The air chambers of the tire will extend laterally across the tire from side to side and will contain air at normal pressure. The walls will be thick and heavy. The advantage of this tire is to afford the resiliency of a pneumatic with the firmness and freedom of a solid tire. The new tire has not yet been placed on the market, but manufactured for experimental purposes only.

A new tire manufactured by the Buckeye Rubber Company and marketed by the Consolidated Rubber Company, of New York and Akron, is being exploited through one of the most extensive advertising campaigns ever undertaken. The new tire bears the same name as the solid and cushion tires previously manufactured by the same companies—the Kelly-Springfield. The tire is made in three standard types, with the flat, round, and Bailey treads.

The Goodyear Tire & Rubber Company is pleased over the result of the long distance run of Oliver P. Fritchie in an electric of his own make from Denver to New York in 30 days' time. Fritchie averaged 100 miles a day, and his machine was equipped with Goodyear long distance electric tires, a type which the company has had on the market a year, and which is designed to consume as little current as possible. Fritchie had one puncture in Chicago, but drove the other three tires the entire distance, arriving in New York with Denver air.

O. L. Weaver, formerly of the Cincinnati branch, has been placed in charge of a new branch established at Atlanta, Ga., by the Goodyear Tire & Rubber Company.

ROSY FACTS ABOUT THE T. C. F.

PARIS, Dec. 15.—Three years ago the membership of the Touring Club of France was 98,000. At the annual meeting held in Paris last week President Ballif declared that the figures had now mounted up to 115,000, the largest number of any similar club or association in the world.

The income for the year had been $221,718, and the net balance in hand on the year's work no less than $37,353.

During the past two years a total of $2,400 has been given in subventions toward the construction of paths for cyclists in the neighborhood of Paris, and $6,000 have been contributed to the work of repaving the main roads leading out of Paris. This task has been undertaken by the government at a total cost of $600,000, with financial aid from the Touring Club and the Automobile Club of France. When completed the present roughly paved highways out of the capital will have been replaced by perfect smooth granite-paved roads suitable for heavy automobile traffic, and giving easy access to every part of France.

The club awarded its gold medal to Henry Farman for the first cross-country flight by aeroplane, this being, in their opinion, the most important action of the year tending toward the development of travel. One of the 115,000 who had written a violent article against the automobile was held up to scorn.

FIGURES AUTO CHEAPER THAN HORSES.

A Western man, T. H. Proske, whose farm is near Denver, Colo., and who travels daily to the city, decided to test the expense of an automobile as compared with horses for this use. He bought a 28-horsepower Franklin, and after 18 months' use compiled these figures, based on a daily average of 35 miles:

One set of tires	$130.00	
Less credit for old on taken in exchange	35.00	
		$95.00
One overhauling and varnishing		35.00
Average cost of gasoline, oil, and batteries per month, $12; 18 months		216.00
Original cost of motor car		3,040.00
Total		$3,386.00

Selling the car for $2,250 cut the cost down to $1,136, or a little more than five cents per mile.

Being satisfied that the first cost of horses and carriages would exceed the cost of the machine, he figures the upkeep as follows, making no allowance for repairs, depreciation or death of horses:

Feed for two horses per month, $35; 18 months	$630.00
Coachman, boarding himself, per month, $75; 18 mos	1,350.00
Total	$1,980.00

"It will be seen," he says, "that even if there was no sickness, death or depreciation I am still $844 ahead."

This result is reached by deducting from the $1,980, maintenance of a carriage, the $1,136 which the automobile actually cost for 18 months. The cost of upkeep of a new 42-horsepower automobile does not exceed by more than 10 per cent. that of a 28-horsepower machine.

FARMERS LIKE DETACHABLE TONNEAU.

GRAND RAPIDS, Mich., Dec. 21.—Western Michigan dealers expect to push hard this coming season the sale of delivery autos to farmers. Grand Rapids is in the center of the fruit belt, and is already famous as a market. More than 50,000 bushels of peaches have been sold by farmers in a single day since the new market was built, many of the farmers making one or more or as many trips as they can a day. Owing to the necessity of handling their crops with rapidity, the more progressive farmers are adopting automobiles, and so many inquiries are coming into the manufacturers now for delivery cars that many of them have demonstration cars in the city now and are making frequent demonstrations to farmers who will be in the market in the spring. The detachable tonneau car, the dealers declare, made to sell for from $1,200 to $1,600, seems to be the most in demand for this sort of use.

BALTIMORE DEALERS WELL SATISFIED.

BALTIMORE, Dec. 28.—While the tightness of money during the early months of 1908 had its effect upon the local automobile trade, most of the dealers announce that their business during the past twelve months has been at least as good, if not better, than during 1907. The last three months have been splendid ones, and they predict that 1909 will undoubtedly be the banner year for the sales of cars in this city and throughout Maryland.

There is every reason to expect this prediction to be realized, for horseless vehicles are becoming more and more popular here every week. Then, the General Assembly of Maryland has appropriated $5,000,000 which will be used for improved highways in the State; the voters of Baltimore will cast their ballots for or against a $5,000,000 paving loan either next spring or at the following fall election, while a $2,000,000 annex paving loan is being utilized at present for improving the thoroughfares on the outskirts of the city. All of these things are favorable for the increase in the number of automobiles in this city in the near future.

Baltimore has not been much of a field for commercial cars in the past, but these, too, are gradually making inroads. Several of the breweries, wholesale drug companies and other large business houses have put gasoline trucks into service. A number of the department stores, too, are testing electrics for delivery purposes, and these trials have been successful.

A new factory has recently opened up in Baltimore. This is the Carl Spoerer's Sons Company, who are making various types of Spoerer cars. This makes two factories now located here, the other one being the Sinclair Scott Company, makers of the Maryland car.

Licenses have been issued for 1,701 cars from January 1 to December 1, 1908. Forty-one of these were issued in January; 42 in February; 111 in March; 164 in April; 133 in May; 323 in June; 183 in July; 185 in August; 187 in September; 201 in October; 131 in November.

BIG TAXICAB PROFITS IN NEW YORK CITY.

NEW YORK CITY, Dec. 28.—A pamphlet issued by one of the local taxicab companies for private distribution among possible investors, shows that the present profits from the cab service are enormous. This pamphlet showed first that an estimate of an income of 46 per cent. is ultraconservative. The pamphlet goes on to say: "Our own records show that the cabs average 45 miles per day, with two and a half hours' waiting time chargeable to patrons, giving an average gross receipt of $22 per cab per day."

On basis of $22 per day, 360 cabs will earn per year		$2,890,800
Tire charges on this basis	$162,607	
All other charges, including depreciation	448,560	
Chauffeur's 20 per cent. of earnings	578,160	
		$1,189,327
Available for dividends		$1,701,472

This figures out 113 per cent. profit. The pamphlet continues with the statement that the chauffeurs being paid entirely on a percentage basis, only $4.55 per cab per day need be earned in order to pay all expenses and lay aside 25 per cent. for depreciation, so that all above this amount is available for dividends.

FRANKLIN'S ALCOHOL MOTOR CAB.

NEW YORK CITY, Dec. 28.—The agitation of the past year relative to the use of alcohol as a fuel culminates very properly in the production of a motor cab with an engine designed and proportioned for the use of alcohol fuel exclusively. This latest product of the H. H. Franklin Mfg. Company, of Syracuse, N. Y., while not differing in appearance from other 18-horsepower Franklin cabs, has a high compression and a special carbureter to allow the engine to make use of this fuel, which is slower burning ordinarily, but when highly compressed, say to 100 pounds per square inch, burns rapidly enough for a motor speed of 1,000 r.p.m.

GENERAL MOTORS COMPANY AN ACTUALITY.

LANSING, MICH., Dec. 28.—The fact that the General Motors Company, incorporated for $12,500,000 in New Jersey last week, is not alone a reorganization of the Olds Motor Works, but also includes the Buick interests, has led to a renewal of the rumor of a general combine of the producers of low-priced cars which first had its origin last Summer. When talk of the Buick entering the new combine was first heard, it was vehemently denied, but when seen in Detroit to-day, W. C. Durant admitted that "If the report comes from an authentic source, it must be so." Frederick L. Smith, general manager of the Olds Works, states that the change will not affect the business of his company in any way, except that it is anticipated that the merger will enable the product to be marketed more economically, and that the volume of business will be increased. "The Olds Works are now in the most prosperous condition they have ever been in, employing the largest number of men in their history," said Mr. Smith.

The fact that the capitalization of the General Motors Company, divided into $7,000,000 cumulative preferred, and $5,500,000 common, is to be issued in shares of a par value of $1, shows that it is for "popular consumption." One of the promoters is said to be Curtis R. Hathaway, an associate of Ward, Hayden & Satterlee, a New York firm of lawyers, who are reputed to have been connected with rumors of several motor mergers in the past that involved Wall Street financing, but regarding which no definite information was ever obtainable. At one time or another, the name of practically every producer of low or medium-priced cars has been mentioned in connection with the merger, but nothing tangible has ever developed except now where Buick and Olds are involved.

WOMEN'S NEW YORK-PHILADELPHIA RUN.

One of the latest publicity promotions is that of a women's run from New York to Philadelphia and return, scheduled to take place in the near future. Originally intended for this week, the condition of the roads brought about a postponement, with the probable dates during the week of January 10. The list of participants is announced to include several of the fair sex who have demonstrated their ability at the wheel. Entertainment is to be supplied at Newark, New Brunswick, and Trenton on the way to Philadelphia, where the Hotel Walton will be the official stopping place. The return journey will include a run across Staten Island, with courtesies extended by the Richmond Country Automobile Club. A statue of Galatea is among the prizes to be awarded for the most proficient performers.

REVIEWS OF LATE BOOKS.

Motor Car Mechanism and Management.—This book, by W. Poynter Adams, is the second part of a work, the first installment of which deals with gasoline vehicles, while that under review is devoted entirely to electrics and "petrol electrics," this being the Britisher's term for the combination gasoline-electric vehicles that are now receiving considerable attention abroad. It treats of the subject from an elementary point of view and after giving the basic principles of electrical action, goes on to describe the various parts of an electric car and their functions, this being supplemented with chapters on the care and management of each essential of the vehicle. Besides this some types of British electrics and combination cars are illustrated and described. The J. B. Lippincott Company, Philadelphia, are placing the book on the market in this country.

A Manual of Oil Motors and Their Uses.—The author of this work is G. Lieckfeld, and it was originally published abroad, the J. B. Lippincott Company, Philadelphia, issuing it in this country. It is a résumé of past achievements, and presents uses of the internal combustion motor, trather than a work on design, showing the development of the automobile and marine motor from its inception, as well as the development.

News in General

The Premier in the Shadow of Mount Hood.

Through the mountains of Northern Oregon the roads are changeable and frequently quite difficult, but there are compensations in the rugged magnificence of the scenery.

Dayton After Detroit's Laurels.—The number of automobile firms in Dayton, O., has recently been augmentcd by the addition of the Lexington Motor Car Company, with a capital stock of $50,000. This concern will turn out a high-grade four-cylinder car of five and seven passenger capacity in both touring and runabout styles, to sell at from $2,500 to $3,000. Work has been started and material contracted for, so that deliveries may be made within a short time of the first of the 250 cars to be built in 1909. The company has as one of its stockholders Fred N. Coats, who left the position of assistant salesmanager of the Dayton Motor Car Company to act as secretary and general manager.

Rambler Gets Record.—Probably the most frequently bröken and one of the most coveted records in the West is that between Los Angcles and San Diego. Recently this honor changed hands once more when the Rambler fractured the mark previously held by the six-cylinder Franklin. In so doing L. B. Harvey gained possession of the coveted Chanslor and Lyon trophy for the second time. The distance between the two cities and return is 320 miles, and this distance was made in 10 hours 32 minutes, which is 45 minutes better than the old mark. Ralph Hamlin, the Franklin man, announces that he will go right after the new mark.

Rapid Makes Big Addition.—The Rapid Motor Vehicle Co. of Pontiac, Mich., has recently completed two additions to its plant which will nearly double the present facilities. One of these is a new third story added to the office building, adding a space 60 x 80 for administration purposes. Besides this a new steel and concrete structure 60 x 300, two stories high, has been added to the machine shop. When the machinery is installed the present force of 275 men will be fully doubled.

Herz & Company to Move.—Herz & Company, New York City, are about to removc their office and factory to the Puck Building, 303-305-307-309 Lafayette street and 35-37 Houston street, where they will occupy the ground floor now being fitted up to suit their requirements. The new quarters will have double the floor space of the present factory and will be equipped with the latest machinery and devices for the manufacturing of automobile supplies.

A Mitchell Put to a New Use.—Who ever heard of the automobile as the advance agent for a railroad? Sounds rather unique, but that is about the work which was cut out for a Mitchell recently in Texas. The *San Antonio Light* was pushing a new railroad in that section and sent a party out in the car through a part of thc country entirely new to such mode of travel. They covered over 250 miles and returned after two weeks with bonuses of over $800,000.

Still Another Aeroplane Enthusiast.—Among the latest additions to the ranks of the aerial navigators is Lewis Strang, who has been engaged by J. H. Tyson to make a trip to France, where he will receive instruction in the latest flying methods. It is reported that an aeroplane of the Delegrange type has already been purchased and Strang is to bring it back to America if his lessons at the new game are successful.

Mason Enlarges.—The Mason Motor Car Co. of Des Moines has becn reorganized with a capital of $250,000 and the factory capacity will be doubled. The company will hereafter be known as the Mason Automobile Company. A local banker, A. B. Shriver, is prominent in the new company, but E. R. Mason will remain as salesmanager and F. S. Dusenberg as superintendent.

Changes on the Coast.—George W. Shugars, former manager of the Durocar Company's factory on South Los Angeles street, Los Angeles, Cal., has resigned as manager and director. For the present W. H. Pendelton will act as factory manager while the duties of salcsmanager will be looked after by Walter Sahland.

Columbia Works Running Full Blast.—It will surprise many to know that the Electric Vehicle Company, Hartford, Conn., has a force of 400 men turning out from three to five of the formerly well-known Columbia cars. These are about equally distributed between the "30" gasoline and the electric phaeton.

Thomas Gets Hurlburt.—It is rumored in New York City that upon the termination of the contract between the E. R. Thomas Motor Co. and the Harry S. Haupt Company, the latter will be replaced by a factory branch in charge of William B. Hurlburt, former president of thc Garford Motor Car Company.

Uncle Sam Gets Another Steamer.—The first of the new 40-horsepower Model "M" White steamers to be shipped from the factory was delivered a few days ago to the purchaser, the United States War Department. The car has been assigned for the use of the general staff in Washington.

Medal Awarded Holsman.—As winner of the class A, for motor buggies, at the Algonquin Hill Climb, the Holsman Automobile Company of Chicago has recently received the medal for this event. The design is of silver, framed in green velvet and encased in a green leather box.

IN AND ABOUT THE AGENCIES.

Franklin Agency Appointments.—The H. H. Franklin Manufacturing Company, of Syracuse, N. Y., announces the following new agencies: B. H. Byrne Garage Company, West Pearl street, Jackson, Mich.; Amos Post, Catskill, N. Y.; Seattle Automobile Company, Tacoma, Wash.; Easton Automobile Company, Easton, Pa.; F. F. Morrell & Son, Riverhead, Long Island; L. N. McCarter, Norristown, Pa.; Hugh H. Lewis, Fort Worth, Tex.; E. R. Wilson, Ishpeming, Mich.; Elizabeth Automobile Company, Elizabeth, N. J.; L. B. Russell, Jr., Comanche, Tex.; Corsicana Motor Car Company, Corsicana, Tex.; Charles Denegre, Birmingham, Ala.; H. B. Sproul & Company, Staunton, Va.; N. N. Steffes, Winona, Minn.; W. B. Jernigan, Pine Barren, Fla.

Marion, Indianapolis.—The Marion Motor Car Sales Company, with offices at 238 Massachusetts avenue, Indianapolis, is the name of the new selling concern, organized to sell the entire output of Marion cars, which will consist of three styles, but all using same chassis. The new Marions have 35-horsepower motors and list at $1,850. B. F. Meixell, for the last eight years with the Fisk Rubber Company, is salesmanager of the new company.

Knox, Philadelphia.—The North Philadelphia Auto Station, 3425 North Broad street, has secured the agency for the Quaker City and adjacent territory of the Knox car. The Knox was formerly represented there through a branch house, and later the Foss-Hughes Company looked after the Knox commercials, but for some time past the company's product had been unrepresented in Philadelphia.

Stromberg Branches.—The Stromberg Motor Devices Company, of Chicago, has opened a branch at 319 Columbus avenue, Boston. It has also appointed the Standard Automobile Company its Pittsburg agents and the Auto Equipment Company agents for Philadelphia and vicinity.

Allentown Changes.—The Hamilton Auto Company, of Allentown, Pa., has absorbed the Hamilton Peatty Company and will open up new sales rooms and a garage on the Rink property. This company already has the Ford agency.

Knox, Chicago.—The Knox Automobile Company, of Chicago, will remove to 1458 Michigan avenue as soon as the nccessary repairs can be effected. A five-year lease has been procured on this property.

New Company in New York City.—The Howard & Company Auto Exchange has leased quarters at 1666 Broadway, where it will handle high-grade foreign and domestic cars.

Oldsmobile, Newark, N. J.—The Oldsmobile Company, of New York City, has established a branch at 88 Washington street, Newark, N. J.

Crawford, Newark, N. J.—The Mitchell Automobile Company, Halsey street,

Newark, will also sell after January 1 the Crawford car, made at Hagerstown, Md.

Chalmers-Detroit, Allentown, Pa.—Lawfer Automobile Company, of Allentown, Pa., has taken the agency for the Chalmers-Detroit.

Elmore, Santa Ana, Cal.—D. J. Bastanchury has taken the agency for the Elmore car at Santa Ana, Cal.

White, San Diego.—F. C. Fenner has been appointed agent for the White steamer in San Diego, Cal.

PERSONAL TRADE MENTION.

Kyle Wallace, the former assistant superintendent of the Maxwell-Briscoe Company's plant at Tarrytown, N. Y., has accepted the position of superintendent of the works of the Colburn Automobile Company, at Denver, Col.

J. A. Tuthill, sales agent for the Dayton Airless Tires for New York City and vicinity, has located at 1966 Broadway.

W. E. Knight, formerly with the New York Leather Belting Company, has joined the H. H. Franklin Mfg. Co.

OBITUARY.

Arthur W. Tobin, president of the Continental Motor Mfg. Co., of Muskegon, Mich., died December 13 at the Augustana Hospital, Chicago.

RECENT INCORPORATIONS.

Prospect Heights Automobile Company, Brooklyn, capital $125,000, to manufacture automobiles. R. L. Kelly, F. F. Reilly and L. C. Howard were named.

West Medford Automobile Company, Medford, Mass., capital $20,000, to do a general automobile business. President, A. E. Kenney, and treasurer, C. E. Hall.

Morgan Motor Car Company, Wilmington, Del., capital $500,000. E. L. Squire, K. M. Byrne and J. A. Byrne are interested.

Atlantic Motor Company, Greensboro, N. C., capital $25,000, to manufacture and sell motors, engines and machinery.

Bell Carbureter Company, 305 Garfield avenue, Aurora, Ill., capital $12,000, to manufacture auto attachments.

G. H. Dunham Company, Boston, capital $25,000, to do a general automobile business.

TAXICABS AND TRANSIT.

Motor Railway Cars Replacing Steam. Pennsylvania railroad officials have ordered several Union Pacific gasoline motor cars, one of which will be placed in service on the Indiana branch between Blairsville and Indiana, replacing all other steam-drawn passenger trains. Tests will be made with the others in the Pittsburg district on the main line between Pittsburg and Pitcairn, as well as on the Conemaugh and Monongahela division. If these tests prove the suitability of the cars for this work a number of them will be ordered.

Lansing, Mich.—The fire chief of this city recently tested out the combined automobile fire engine and hose wagon. The test was a complete success, but six seconds being required to start. A speed of 40 miles per hour was shown and a stream of water was pumped 20 feet above a six-story building. The capacity of the machine is 700 gallons per minute.

Atlantic City, N. J.—Louis Kuehnle, Edward Bader, Dr. B. F. Coll, Charles Gondolf and William Harris have formed a company for the purpose of supplying the City-by-the-Sea with taxicab conveniences. Twenty machines have been ordered, the first of which arrived last Friday. The company has decided to fix the price basis at 40 cents a mile.

Modesto, California.—A new road in the West running from Modesto to Empire, Cal., has just been completed. This will be known as the Modesto Interurban, and will be operated exclusively by gasoline motor cars. If the service connecting with the Santa Fe at Empire is successful it will be extended to Oakdale, where it will connect with Sierra railway.

Covington, La.—The St. Tammany & New Orleans Railway & Ferry Company has received its first gasoline railway car. This, an open body, 50-passenger car, will be put in service immediately, running to and from Covington, La.

Placerville and Lake Tahoe, Nev.—The stage line between Placerville and Lake Tahoe, made famous by Mark Twain's story of Horace Greeley, is to be brought up to date by the use of motor buses.

Reading, Pa.—A company is in process of formation which will operate a system of taxicabs in Reading. Two of the vehicles are already at work.

Yellowstone Park.—The old stage in Yellow Stone Park is being replaced by a modern Franklin air-cooled touring car.

GARAGE NEWS OF ALL KINDS.

Los Angeles, Cal.—The Los Angeles agent for the Thomas, Renc A. Brassey, operating under the corporate name of Thomas Motor Car Company, has completed plans and started the construction of what will be the finest garage and salesroom in Southern California. This new building, which will be located at 646 South Olive street, will be of pressed brick, 70 by 165, and will cost upward of $100,000. In addition to this up-to-date building, Mr. Brassey has engaged, among others, Montague Roberts, the famous Thomas racing driver, to assist him.

Wilmington, Del.—A new garage has been opened at Wilmington, Del., by the Wilmington Automobile Company, who will handle the Franklin. The garage building adjacent to the new Avenue Theater at Delaware avenue and Tatnall street, is 83 by 114 and two stories high. The first floor provides machine and repair shop as well as storage space. The second is given up to storage entirely.

Terre Haute, Ind.—John Cox, who retired as manager of the Terre Haute (Ind.) Automobile Company some time ago, will erect a garage at 222 South Seventh street, and under the firm name of Cox & Company will compete with his former employers. A modern building 67 by 100 will be erected.

Omaha, Neb.—The Coit Automobile Company is preparing to build a reinforced concrete garage on the corner of Farnam and Twenty-third streets, in the midst of the automobile district. The building will have a frontage of 72 feet and a depth of 132 feet.

Harrisburg, Pa.—The Central Pennsylvania Automobile Company is reconstructing the building at Fourth and Chestnut streets, Harrisburg, Pa. A fireproof oil and gasoline room will be a feature. They handle Locomobile, Franklin, Oldsmobile, Buick and E-M-F cars.

Bakerfield, Cal.—The Bakerfield Garage Company has purchased property fronting on Nineteenth and Twentieth streets, where it will erect a complete garage and repair shop at an expense of about $50,000.

Portsmouth, O.—W. J. Friel has just taken possession of his new garage and repair shop at 14 West Fifth street, where he will be able to do a large volume of work of the class that makes for future success.

Fort Smith, Ark.—A new garage has been opened in Fort Smith which will handle the White steamer and Oldsmobile. This is the Ward & Harris Automobile Company, North Tenth and B streets.

Des Moines, Ia.—A syndicate composed of W. J. Riddell, R. R. McCutcheon and R. Parry has recently purchased the property at 1011-1015 West Walnut street for the purpose of building a garage.

Perth Amboy, N. J.—The Perth Amboy Garage Company is moving into its new building on Madison avenue and will soon be ready for business. Alex. Conquest will be in charge.

Orlando, Fla.—B. C. Abernethy, manager of the Cook Auto Company, has just let the contract for a new large garage next to its present location to handle the increased business.

Long Island City, N. Y.—The Packard Automobile Company has purchased land in Long Island City and will erect a large building for a garage, salesroom and repair station.

Scranton, Pa.—The Standard Motor Car Company is building a new two-story concrete garage in Dupont court, which it expects to occupy about the middle of January.

New Haven, Conn.—George W. Curtis, superintendent of the Holcomb garage, New Haven, will erect a new building at Orange and Audubon streets.

Cincinnati.—The Eagle Automobile Company has leased the property at 3139 Reading road, where work will start at once on the erection of a concrete garage.

Redfield, S. D.—E. C. Issenbuth is building a garage which he will rent to T. P. Blaine, who will carry on a garage and automobile supply house.

Farmington, Me.—The F. E. McLeary Company, Farmington, Me., will build a two-story brick and frame garage with concrete floors.

Jacksonville, Fla.—Fred Gilbert has bought the property at the corner of Church and Laura streets and will erect a four-story garage.

Beloit, Wis.—The contract has been let for the mason and concrete work on the new garage for C. Mattison & Son, Fourth street.

Kansas City, Mo.—L. A. Robertson, agent for the Franklin in Kansas City, is erecting a new garage and salesrooms on Main street.

Maywood, Ill., now has a garage, G. T. E. Fuller having recently opened a large building at Lake street and First avenue.

Wilmington's (Del.) Newest Garage.

An Industry's Progress of a Decade

By Thos. J. Fay

Thos. J. Fay

THE mother of invention should be mighty fond of the most youthful of her progeny, the automobile; as well she may. A decade ago the motor-driven car was but the dream of pioneers, out of which they awakened to be smote by the sunlit dawn of a new era. To scan the horizon of human endeavor but a few years ago would have disclosed the automobile as the merest speck, shrouded in mystery, and stayed by prejudice.

It would be to dip deep in the brine of lore, therein to find a theme wonderful in its ramifications, with never a chance of reflecting the splendid possibilities the future holds for this geocentric product, vastly portraying the genius of man.

With an abiding faith in the future of the automobile, considering well the dizzy height attained, the treacherous pathway, and the stragglers that ever bestrew the onward march of progress, it will not be amiss to render up an accounting of the assets, to countermarch that splendid galaxy, and thereby to lend confidence to such further efforts as progress dictates, agged on by necessity.

A résumé of current events, something by way of encouragement, and a stray remark, will scarcely be too much. In the pages to follow, then, the aim will be to discuss the automobile as it is, with perchance a reflection or two portraying the future trend and a resting place for mile stones.

SPECIAL SHOW ISSUE GRAND CENTRAL PALACE, N. Y. **PRICE, 25 CENTS**

THE AUTOMOBILE

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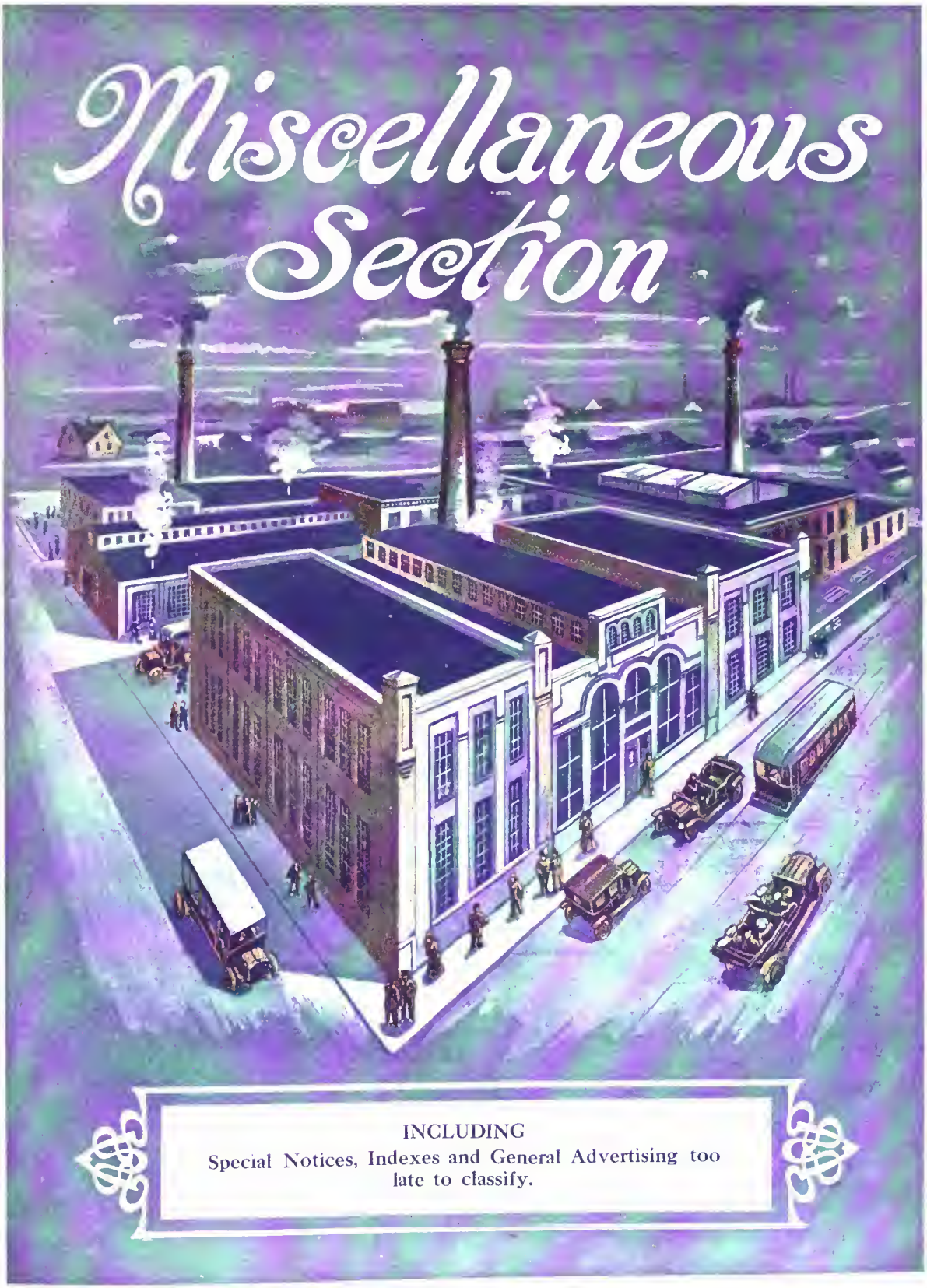

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Pat. Feb. 4, '08. Pat. July 28, '08

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The **SIRENO** adapted for large cars.

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Both types have BALL-BEARING MOTORS

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New models exhibited at all the shows. Get our new printed matter. Circular "A" describes these models and other accessories for 1909.

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SPECIAL NOTICES

Advertisements inserted under this heading at 20 cents per line; about 7 words make a line. Remittance should accompany copy Replies forwarded if postage is furnished.

Cars for Sale

A 1909 seven-passenger Apperson, cost $4,700. February delivery. Failure in speculation forces me to sell my contract at a loss of $1,000; thie your gain. F. P., care The Automobile.

A 1907 AUTOCAR RUNABOUT, with top and nearly new.....$650.00
1907 24-h.p. Jackson runabout, shaft drive, top and glass front, nearly new..... 750.00
1907 35-h.p. Grout, five-passenger, with top, Rutenber motor..... 800.00
Thomas B. Jeffery & Co., 1462 Michigan Ave., Chicago, Ill.

ALL KINDS of cars at all kinds of prices, $150 and up. Write us or call and we can satisfy you. Western Auto Sales Co., 309, 10-11 Michigan Ave., Chicago, Ill.

AN ELECTRIC VICTORIA in fine order; batteries nearly new; demonstration; using gas car; reason for selling; cost $1,375; price, $500. Address E., room 1004, 261 Broadway, New York.

ANNOUNCEMENT.—SWEEPING REDUCTION in used White Steamers. During the paet year we have taken in exchange for newer models, a considerable number of used cars.

We must make room for the new stock, therefore these cars will be sold at ridiculously low prices in order to close them out quickly.

Every car we take in—regardless of how much or how little it has been run—is put through our repair shop and overhauled from engine to rear axle, every working part that ehowe wear is renewed and the bodies are painted, and so far as practical purposes are concerned, the cars are as good as when they left the factory new.

In buying from us you are dealing with the makers direct, and not with individuals, or second-hand dealers, who have nothing to lose by misrepreeentation.

White Steamere from $300 up.

Write for further details and don't delay if you wish to take advantage of this opportunity. The White Company, Broadway at 62d St., New York City.

A PIERCE-ARROW car, 40-h.p., 1907 model, full equipment, regular Pierce top, and glass front. The car is in first-class condition. For further particulars, address George A. Driggs, Waterbury, Conn.

APPERSON touring car, cost $3,750. In perfect condition, with top, glass front, extra tires, etc., $1,750 in money (not farms or mining stock). E. Hambley, S. E. Eighth and Main Sts., Cincinnati, Ohio.

AUTO BARGAINS.—Before you buy, talk to us. We have them from one to five hundred dollare and can save you money. Ewing-Kean Machine Co., 723 W. Fort. Detroit, Mich. 'Phone, West 1253-R.

AUTOMOBILE. — Single-cylinder Cadillac, nearly new; reduced price. J. Rockliff, 352 Vine St., Pittsburg, Pa.

AUTOMOBILE BARGAINS. — Used machines, all kinds, $150 and up. Send for our complete list. Johnson Auto Co., 4390 Olive St., St. Louis, Mo.

B. L. M., 35-hp., 1908 model, high-speed runabout; very beet condition; complete equipment and epare parts. Addrees "Duncan," care The Automobile.

DON'T PAY TOO MUCH or too little for a slightly used or second-hand automobile. Extravagant claims are made for automobiles at your own price. We have 150 to 200 types and models of various makes of automobiles at a full dollar of automobile value for every dollar of price. Much detailed information of great economic interest to prospective purchasere is here for you; and you will be truly grateful after investigating by a personal call or through the medium of our price list. International Auto Co., 542-544 Wabash Ave., succeesors to Chicago Auto Warehouse and Chicago Auto Commission Co., Chicago, Ill.

WE HAVE NEW YORK'S REAL AUTOMOBILE SHOW—With the largest garage in New York and a floor space of over 60,000 feet, crowded with new and second-hand cars, the majority on conelgnment, we offer more inducements to the man seeking a good automobile at a low price than any automobile show can present. We have over 250 cars for quick sale, at prices from $150 to $4,000. The following will give you some idea of what we can offer:

Panhard touring car, fully equipped....	$1,000
Rochet Schneider, like new, fully equipped	1,450
De Dietrich touring car, fully equipped.	1,000
Packard touring car, like new.....	1,850
Matheson touring car, like new, fully equipped	1,450
Oldsmobile touring car, like new, fully equipped	725
Oldemoblie Tourabout, rumble seat....	900
Thomas Tourabout	600
American More Tourabout, 1908.....	950
Knox air-cooled runabout.....	350
Franklin air-cooled runabout.....	350

We are different from any other houee in New York and can offer distinctive values. Our business necessitates quick sales, and to secure the latter low prices must be offered. We sell cars on 5 per cent. commission basis, acting as the brokers for the owners. Those who purchase here escape paying a profit to the dealers. This system gives ue the choice of all the desirable cars. Our patrone practically come in contact with the owner and get the car at the figure he is willing to accept. It would take pages to describe the many cars here, and as there are new arrivals daily, the best plan is to come and inspect; 'phone or write for bargain list. We are two blocks from Broadway. This means many hundreds saved in expenses and is one reason why our prices are so much lower than others ask. Ours is a practical system which appeals to the intelligent and explains why we are America's real largest dealers. Manhattan Storage Company, 334-340 West 44th St., New York City, two blocks from 42d St. Station 9th Ave. "L."

CAMERON, air-cooled, three-passenger roadeter, four-cylinder; taken in exchange and thoroughly overhauled; perfect running order; $550. Cameron Agency, Room 601, 546 Fifth Ave., New York City.

CORBIN touring cars and runabouts, $300 and up. Thoroughly overhauled by us and guaranteed. Corbin Motor Vehicle Cop'n of N. Y., 1888 Broadway, near 62d St., New York City.

FOR SALE OR EXCHANGE.—2 new Rapid Sight Seeing cars, less than 3 months old; 20-passenger; 30-h.p., 2-cylinder engines; will exchange for touring cars; want 4-cylinder engine and seating 5. Auto Transfer Co., Hattiesburg, Miss.

FIVE (5) ELECTRIC sight seeing automobiles, three 24-passenger terrace seats, two 20-passenger, all half-lazy backs; will sell for less than half price of new. If interested, answer Motor Transit Co., Buffalo, N. Y.

FRANKLIN light touring car; all in fine condition; extra equipment; specifications and photo sent on requeet; price, $300. H. J. Daniels, Norwich, N. Y.

HAVING PURCHASED next year's model, will let go my 25-h.p. Peerless, demi-limousine body, for $1,250; completely equipped and put in A-1 shape; no agents need answer. Address Box 134, care The Automobile.

HOLSMAN.—Just overhauled; Schebler carbureter, leather top, special battery case; low price. 47 William St., Newark, N. J.

MAXWELL runabout model LC 1908, with top, gas lamps and generator complete; good as new, only run a short while. Will sell for $600 and guarantee it to be in perfect order. Write J. O. Sperks, Gaffney, S. C.

MUST DISPOSE of my Stoddard-Dayton roadeter for cash at once; was purchased in May, 1908, and run only 2,000 miles; looks just like new; has four cylinders, 40-h.p. motor; in perfect condition; first offer for $1,400 gets it; dealers need not answer. Address Box 23, care The Automobile.

ODEL S, "'07" HAYNES, 4-cylinder, 5-passenger touring car, in first-class condition; car and equipment cost $2,800; will sell for less than half cost. Write for particulars to G. A. St. Germain, 241 Main St., Berlin, N. H.

MY KNOX auto for $250, in fine condition, two seats, rear seat detachable; will make good delivery car; three extra tires; this machine always goes. R. B. Barnes, 72 Tremont St., Rochester, N. Y.

ONE 1907 Model G touring car, fully equipped, in A-1 condition; run about 5,000 miles; will sell at a bargain. Dauer Auto Co., Providence, R. I.

ONE 1907 Pope Hartford roadster. One 1906, Type 12, Pope Toledo Touring car. One 1907, Model R, 4-cylinder Stevens-Duryea. One 1907, Model U, 6-cylinder Stevens-Duryea. One 1908, Model S, Ford roadster. One Model E, single-cylinder Rambler. All theee cars in good condition and will be sold cheap. For further particulars write The Arthur Gardiner Garage, Kenoshe, Wis.

ONE 1906 White steam touring car, equipped with top, etc.; price, $1,000. One 1906 Model "G" Franklin touring car, equipped with top; A-1 condition; price, $850. One 1908 Model "10" runabout; used a few times for demonstrating; A-1 shape; price, $850. One 1904 Cadillac touring car; good condition; price, $350. 1907 Oldsmobile runabout, A-1 condition; price, $1,800. One 1906 Model R Stevens-Duryea, overhauled and repainted; price, $1,200. One 1907 White steam runabout, good condition; price, $1,300. One 1906 Thomas with tourabout body; first-class condition; price, $1,500. Haleey Automobile Co., St. Louis, Mo.

PEERLESS "30" 1909. — Regular touring body with removable glass enclosure for winter. Specially fine job; cost $5,400. Family going abroad, will sell at a reduction. Address G. R., care The Automobile.

RAMBLER, two-cylinder 1906 model; equipment, full set of lamps, generator and top; in fine condition throughout; tires, Goodrich; will accept first reaeonable offer. Addrees Box 656, Waterbury, Conn.

SACRIFICE. — 1907 Thomas Flyers; 1906 Acme; new 1907 Reo touring car; second-hand Model "R" Ford, 1907. E. S. Young, Reading, Pa.

STEVENS-DURYEA little six, run 2,000 miles; bargain; cash. Stevene, 265 Halsey St., Newark, N. J.

STODDARD-DAYTON—Some slightly used cars for sale; runabout, roadster, touring car and limousine; ln A-1 condition. The Dayton Motor Car Co., Dayton, Ohio.

TWO-PASSENGER RUNABOUT, 6-h.p., sliding gear, shaft drive; fine condition; $150. The Auto Exchange, 7 Reeervoir, Providence, R. I.

WANTED TO SELL or exchange, demi-limousine 30-35 Rainier, for a small runabout 1908 Buick. Gem, 85 Warren St., New York City.

WE HAVE for sale the following second-hand care st bargain pricee; 1907 Model D touring car; 1906 Model D touring car; 1907 Model G runabout. Franklin Automobile Company, 73d St., Amsterdam Ave. and Broadwsy, New York.

WHITE steam touring car, 1908 Model K, used only five months and in superb condition throughout; nicely equipped and will be sold at a bargain if taken at once. Address White Steamer, 1200 Niagara St., Buffalo, N. Y.

WINTON '06 four-cylinder touring car, in perfect condition, fully equipped, top, $800. The Fulton Garage, Fulton, N. Y.

WINTON SIXTEEN-SIX, 1908 model, nicely equipped and in absolutely fine condition; will accept $2,400 if taken at once. E. R. Thomas Motor Co., Second-Hsnd Department, 1200 Niagara St., Buffalo, N. Y.

WOULD SELL Pope-Tribune, one-cylinder, A-1 condition and extrae; new raccoon coat and gloves, fur cap; new Witherbee 6-60, tire covers, oil lamps, ammeter-voltmeter, all for $200. Address Box 282, Pearl River, N. Y.

$1000 Haynes 50-h.p. touring csr, new. Braby & Myers, 364 Columbus Ave., Boston, Mass.

1906 CADILLAC touring csr, 1908 Great Western No. 12 touring car, 24-h.p.; 1907 Reo touring csr, 20-h.p.; 1905 Oldsmobile, all in good condition. The Fulton Garage, Fulton, N. Y.

1908 REO ROADSTER, five lamps, top, Warner speedometer, extra rear seate. F. E. Mason, 93 Exchange St., Rochester, N. Y.

1908 FRANKLIN Model G Runabout; top and all extras. This csr is practically new, been run little over 1,000 miles; price, $1,200. C. S. Hansom, Albany, N. Y.

1908 FRANKLIN Model D touring car, 28-h.p., hss been used as demonstrator, with double system ignition, Bosch magneto, in first-class condition, with top, glass front snd all extras, at a very reasonable figure. Dauer Auto Co., Providence, R. I.

1908 MAXWELL, Cameron, runabout and touring cars; 1907 Ford, Pullman, Stoddard-Dayton, Buick and Reo runabout and touring cars; 1906 Acme touring car; 1905 Rambler and Locomobile touring cars; get prices and specification forms. Berks Auto & Garage Co., Reading, Pa.

1908 40-H.P. BUICK touring car, in sbsolutely first-class condition in every respect; painted maroon and red upholstering; complete with top, speedometer, clock, chains, full lamp equipment, two extra shoes, inner tube and equipped with magneto; cost owner $2,800 and run less than 2,500 miles. Address "Buick Bargain," care this paper.

Cars Wanted

HAVE ABOUT $500; want an automobile; must be four-cylinder, shaft driven, sliding gear; no objection to one out of repair or broken if of good make. Correspondence solicited. 725 E. Water St., Syracuse, N. Y.

TWO four or six-cylinder motors, 20 to 40-h.p.; must be in good ehape. W. W. Butts, Oxford, New York.

WANT the best five-passenger car $400 will buy. G. M. C., room 422, 47 West Forty-second street, New York.

WANTED.—Carrico two-cylinder air-cooled engine; must be cheap. L. T. Rhoades, Phoenixville, Pa.

WANTED. — Oakland, two-cylinder; state price and equipment. Addrees "H. L. P.," care The Automobile.

WANTED.—1908 Stevens-Duryea light six; state price, shop number, equipment. Address "F. F.," care The Autoombile.

WANTED TO TRADE for modern 4-cylinder automobile 400 shares of Kalamazoo Gold Mining stock, par value $1.00 per share. F. W. Fisher, Sedalia, Mo.

WANTED. — Smsll, second-hsnd touring car; late model, tonneau body preferred; give full particulsrs and price. Address Box 144, care The Automobile.

WE WILL PAY full value in spot cash for your automobiles in quantities from one to one hundred. Call or mail descriptions. Broadway Mammoth Automobile Exchange, 245 West 56th St., New York City.

Parts and Accessories
(FOR SALE.)

A LIMOUSINE BODY for sale; in first-class condition; fits any car; cost $2,200; bargain. 1225 McGee St., Kansae City, Mo.

AUTO TIRES.—All the best makes of tires on hand, at cut prices; a big etock of "epecials" and "seconds" at "Bargain Counter Prices"; we will eave you money on any make and any size; write or call. Broadway Mammoth Automobile Exchange, 245 West 56th St., New York City.

AUTO TIRES.—28x3, $10; 30x3, $11; 30x3½, $13. These are brand new, clean goods. Overstocked. Muet eell. Write to-day for new 1909 prices on any size. Will surprise you. A. H. Kaener, 152 Church St., New York City.

AUTO TIRES, new clincher casings, fresh stock, every one a bargsin:

28x3	$10.65	30x4	$17.90
30x3	11.15	32x4	18.30
32x3	11.75	34x4	21.00
28x3½	13.00	36x4	22.00
30x3½	13.50	34x4½	21.50
32x3½	15.80	36x4½	23.50
34x3½	16.50	36x5	26.00
36x3½	16.50		

W. M. Sharpe, 118 West Broadway, New York City.

BRAKES — External double-acting band brakes; 939—9⅛"x1¾"; 72—9"x2⅛"; 57—6"x2". No better made; will sacrifice to quick buyer. Addrees Blackwell Brake Co., Box 1031, Bridgeport, Conn.

BARGAINS in leather non-skid tire protectore; all sizes and prices. Fan belte for all cars, gusrsnteed 10,000 miles. Write us or call. Detroit Leather Works, 97 Larned St., East Detroit, Mich.

BARGAINS.—4-cylinder dssh coils, $22; five-feed mechanical oiler, $8; bevel gear axlee, $80 per pair; wool wheels, all sizes, $18 per set; clincher tires, 28x3, $9; 30x3, $11; tonneau body painted and upholstered, $40; 2-cylinder dash coils, $9; honeycomb radiator, $20; three speed and reverse transmiesion, $35; opposed motor, air-cooled, 3x3, $35; 4x4, $50; 4½x4, $75; 4½x5, $90; 4½x4, water-cooled, $75; 4½x5 $90; 5¼x4½, $120; 5x4½, $90; front sxies, $5 to $18; bevel gear axles, $85 per set; gas tanks, $2.50; steel dashes, $4; three speed and reverse transmission with differential, $50; Warner No. 3 differential with sprocket, $9; complete set of parts to build 2,000-lb. tonneau car, $600. Auto Parte Co., 52 W. Jackson Blvd., Chicago.

BOOTH'S FELT PACKINGS for rspairing automobiles are designed to retain the oil, exclude the duet and tighten loose joints, and are absolutely necessary in connection with ball, roller and plain bearings, hubs and transmission casee, and are made in etrips and endless rings of any eize and thickness to fit any car; dust rings for the hubs, strips for transmiseion casee, waehers for all lubricating and dust-excluding purposes. I have dies to fit any bearing of any make of car, and can fill any order within twenty-four hours. You will get exactly what you want, and the price will be right. There are eo many sizes, no dealer carries a full stock. Write for prices and give dimensions. N. E. Booth, 741 39th St., Brooklyn, N. Y.

ENGINES, axles, transmissione, frames, bodiee, carbureters, timers and auto parts generally at bargain prices. Let ue know what you want. Logan Construction Co., Chillicothe, Ohio.

BARGAINS in new inner tubes; all guaranteed to hold air. Purchased at special eale.

28x2½, 28x3½, 30x4	$2.50
28x3, 30x3, 30x3½	3.00
32x3½, 32x4, 34x3½	3.50
34x4, 34x4½, 34x5	4.00
36x3½, 36x4, 36x4½, 36x5	4.50

Write for prices on other supplies. We also repair an ymake of tire. All work guaranteed. Chicago Vulcanizing Co., 1400 Michigsn Ave., Chicago, Ill.

FOR SALE OR TRADE.—Four sets of Kimball steel tire casings, new; one Prest-O-Lite tank; steel coil and one 1906 single-cylinder Olds runabout. P. P. Pagett, General Delivery, Indianapolis, Ind.

FOR SALE.—300 sete 28x3 best grade artillery wheels fitted with clincher rings, less hubs; write for bargain prices on single sets or the lot. Thomas B. Jeffery & Co., Kenosha, Wis.

FOR SALE OR EXCHANGE, being overstocked: several standard high tenelon magnetos, also double ignition eysteme, coil and distributors. Wanted cash offer, or will accept in exchange, any standard tires (sizee wanted, 34x4 and 36x4½), or New Victor Talking Machines. Offer also wanted on a 1909 Continental car, vslue $3,500. Full particulars, sddress "Retired Auto Manufacturer," care The Automobile.

OUR FRICTION TRANSMISSION to tranemit 8-h.p. at $21 ie like finding money; other bargaine. Send for catalogue. Climax Electric Works, New Salem, Mass.

FORD RUNABOUT owners, now ie the time to order our outfit to change your N. S. or R. into new "S" roadster, new fenders, and rumble seats, dash hoode, folding hoods, glass fronts, tope, oilers, magnetos. Write for catalogue to-day. Auto Rebuilding Co., 1349 Michigan Ave., Chicago, Ill.

RADIATORS, hoods, mud guarde, metal dishes, gasoline and water tanks. If building or remodeling a car, it will pay you to write us, ss we lead in this line. Auto Sheet Metal Works, 2230 Michigan Ave., Chicago, Ill.

SIX CYLINDERS, $1.50; four cylinders, $1; two cylindere, 50 cents, is all you have to pay for the most indispensable auto tool made, "The Trouble Finder." When put on the spark plug, you can tell if your timer is in the right place; you can tell which cylinder is not doing ite work, caused by lesky valves or a faulty epark plug. Works the same on dry cells, etorsge or magneto. A good investment for the owner, chsuffeur and the repairman. Sent prepaid for stamps, check or currency. Sallander Auto Co., Fort Madison, Iowa.

SPECIAL LOT supplementary springs, wind shields, storage batteries, tire treads, repair kits, boots and patches. Factory pricee. Auto Economy Co., 1426 Michigan Ave., Chicago.

SPECIAL lot 1909 Schebler Carbureter outfits, complete for Reo, Ford, Buick, Maxwell, Cadillac, and other cars; more power, easier starting, better control; $10.75 to $18 complete. Jenkins Specialty Mfg. Co., Sumter, S. C.

STEVENS-DURYEA repair parts.—15 per cent. discount. C. D. Snow, 62 Glenham St., Providence, R. I.

TIRE BARGAINS.—25 sets 36x3½", 5 sets 32x4½" Dunlop Universal tires; also several sets Clincher tires, mililmeter sizes, plain and Midgley tread; all first-class goods; excellent value. C. A. Leonard, 691 Psrk St., Hartford, Conn.

TIRES, TIRES.—We can sell any make, sny size or style tires or tubes for less money than any dealer in the United States. Do not buy until you get our prices. Send for complete list. Excelsior Tire Company, 1777 Broadway, New York City.

TIRES.—New goode, new goods, 1908 stock.

28x2½	$9.00	28x3	10.00
30x3	11.00	34x4	20.00
30x3½	13.00	30x4	17.50
32x3½	$16.00	32x4	19.00

Mail ordere filled promptly. We ship goods to every part of the globe. Anchor Tire Co., 88 Chambers St., New York City.

UNTIL FURTHER NOTICE, runabout tops, $20; touring car tops, $35. C. G. Meyer & Son, Tiffin, Ohio.

WE OFFER GENUINE BARGAINS in five-paesenger touring bodies, finely upholstered and finished in Brewster green; illuetrations and dimenelons sent on request. Berkshire Automobile Co., Pittsfield, Mass.

(Special Notices continued on pags A-7.)

(Specisl Notices continued from page A-6.)

1-2 CYLINDER Splitdorf coil, new, $8; 2-4-cylindar Splitdorf coils, naw, $15; three Extra Units, new, $4 each; two Six-Forty storaga batterias, $6 each. John W. Frey, 722 Main St., Buffalo, N. Y.

4 28x3 WOODWORTH TREADS, second-hand, in good condition, at $8 each; 1 Rambler surray body, black upholstaring, olive green paint, naw, $75; 1 brazing furnace, with Bunsen burnars, etc., at $50; 1 second-hand starting box, and 1 second-hand rheostat, made by Elektron Mfg. Co., 230 volts, at $6 each. E. S. Yousa, Reading, Pa.

1000 MICA SPARK PLUGS, guaranteed or money refunded; 75 cents each, postpaid. Robert Inetrumant Co., 58 Shalby Ave., Datroit, Mich.

10000 WRAPPED thread inner tubes in stock, brand new. Price, $3 each. Small sizes, less. 6,000 clincher and quick detachable shoes. Do us a favor and writa for prices to-day; will surprisa you. A. H. Kasner, 152 Church St., New York City.

1907 LIMOUSINE BODY, built by Rothschild, in Franca, at a cost of $3,800; will fit a Packard. Will sell for $300. Frank Raese Automobile School, 2011 North Carlisle St., Philadelphia, Pa.

Situations Wanted

A POSITION as chauffeur by a young man of 28; competent, honest and strictly temperata, with 14 months' experienca repairing and driving; gasoline car preferred. Address "Vermont," cara The Automobile.

AS SALES MANAGER, factory representative or salesman for New England territory preferred, with Boston headquarters, handling automobiles or accessories. Will maka change shortly. Fourteen years' successful experience with A-1 record. Salary and commission basis. H. S. C., cara Tha Automobile.

BROAD GAUGE man, with large automobila experience on high-grada work, capable of taking antire charge of coach end, will consider change; good opening with some raputable automobile company preferred. Would like personal appointmant at aithar Naw York Show. Address "Executive," care The Automobile.

CHAUFFEUR and repairer, American, fiva years' experience; references. Address "P. L. R.," care Tha Automobile.

DESIGNER and enginear deeires to change position on February 1. Have eight years' experience in construction and design, six years in active practice; member S. A. E.; am familiar with modern machina shop methods and my work will ba clean and thorough in design, up-to-data in every reepect and suited to rapid and economical production. Will furnish partially finished drawings of medium price four-cylinder car. Will attand both coming New York shows and would ilka personal appointment at either. Address "Auto Designer." care The Automobile.

Help Wanted

AGENTS.—A new invention, Cling-tight storm apron, holds lap roba around you; keeps wind and water out and comfort in; perfect freedom for hands and feet to drive an auto; put on or off instantly. Sent on approval. Beebe-Elliott Co., 614 Wisconsin St., Racine, Wis.

MEN.—Wanted, ambitious and energetic men to learn to repair and run automobiles; home study course if desired, or we will pay your railroad fare to Philadelphia and two weeks' board; easy payments; good pay when competent; free booklet. Automobila School, 752 South Broad St., Philadelphia, Pa.

RAPID and accurate designer and detailer, by large Chicago Auto Manufacturing concern. Steady work and good salary; state previous experience. Address Box 111, care The Automobile.

SALESMEN.—In New York and New Jarsey by the Dayton Airless Tire Co. Prefer men who own cars. 1966 Broadway, Naw York.

THOROUGHLY COMPETENT foreman for trimming shop for automobile factory. No attention paid unless experienca, references and salary to start are stated. Address X. Y. Z., cara The Automobile.

WANTED AT ONCE.—Man to take charge of an up-to-data garage handling Studebaker cars only, in a city of 12,000 inhabitants; must hava five years' experience on all makes of cars; no ona naed apply without excellent references; man from some factory preferred. Address Eclipsa Garage, Box 584, Wilson, N. C.

Insurance

INSURANCE for automobilas.—Broad, safa policies at lowest prices; ineuranca against fira, self-ignited explosions, transportation hazards, theft, etc.; bast services guaranteed, no matter whara insurer is located. For particulars address H. W. Beals, 76 William St., New York City. 'Phone, 3052 John.

Auto Schools

AUTOMOBILE ENGINEERING by correspondence. Coursa prepared by A. L. Dyke, first auto supply man. New system with mechanical charts. Course, $10. Something new. Frea pamphlet. Invastigate. Dyke's Correspondenca School of Motoring, St. Louis, Mo.

THE AUTOMOBILE SCHOOL of the West Side Y. M. C. A., the largest in tha country, begins its fifth year for instruction. Men are trained efficiently in a 4 or 8 weeks' course, with personal instruction in road work, and in small group classes in shop work. Send for catalog. 310 West 57th St., New York City.

Miscellaneous

AUTOMOBILE TIRES, rebuilt, retreaded, relined, rim cute and blowouts rapaired, inner tubes repaired and respliced; all work thoroughly tested before shipment and fully guaranteed. Thomas Rubber Vulcanizing Co., 227 South St. Joseph St., South Bend, Ind.

AUTOMOBILISTS, ATTENTION!—A grand pair of cinnamon bear robes, $30; cost $200; fur-lined coat, lined throughout with the beet Australian mink, Persian lamb collar, sell for $35; cost $150 in Montreal. Cali or write J. Loew, 520 West 145th St., New York City.

COIL REPAIRING.—Ship your coils. We repair them at the lowest expense and guarantea our work for two yaare. Our unexcelled facilities enabla us to do this. "We do things here." Marinette Electrical Repair Co., Marinette, Wis.

CRATE for Packard touring car for sale. Any ona expecting to tour Europe will do well to consult C. L. Candee, Princaton, N. J.

FOR SALE.—4-h.p. Mitchell motorcycle, brand new. Only $68. Comet Motor Works, Madison and Canal Sts., Chicago.

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(Specisl Notices continued on page A-9.)

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(Special Notices continued from page A-7.)

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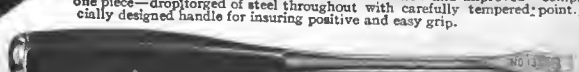

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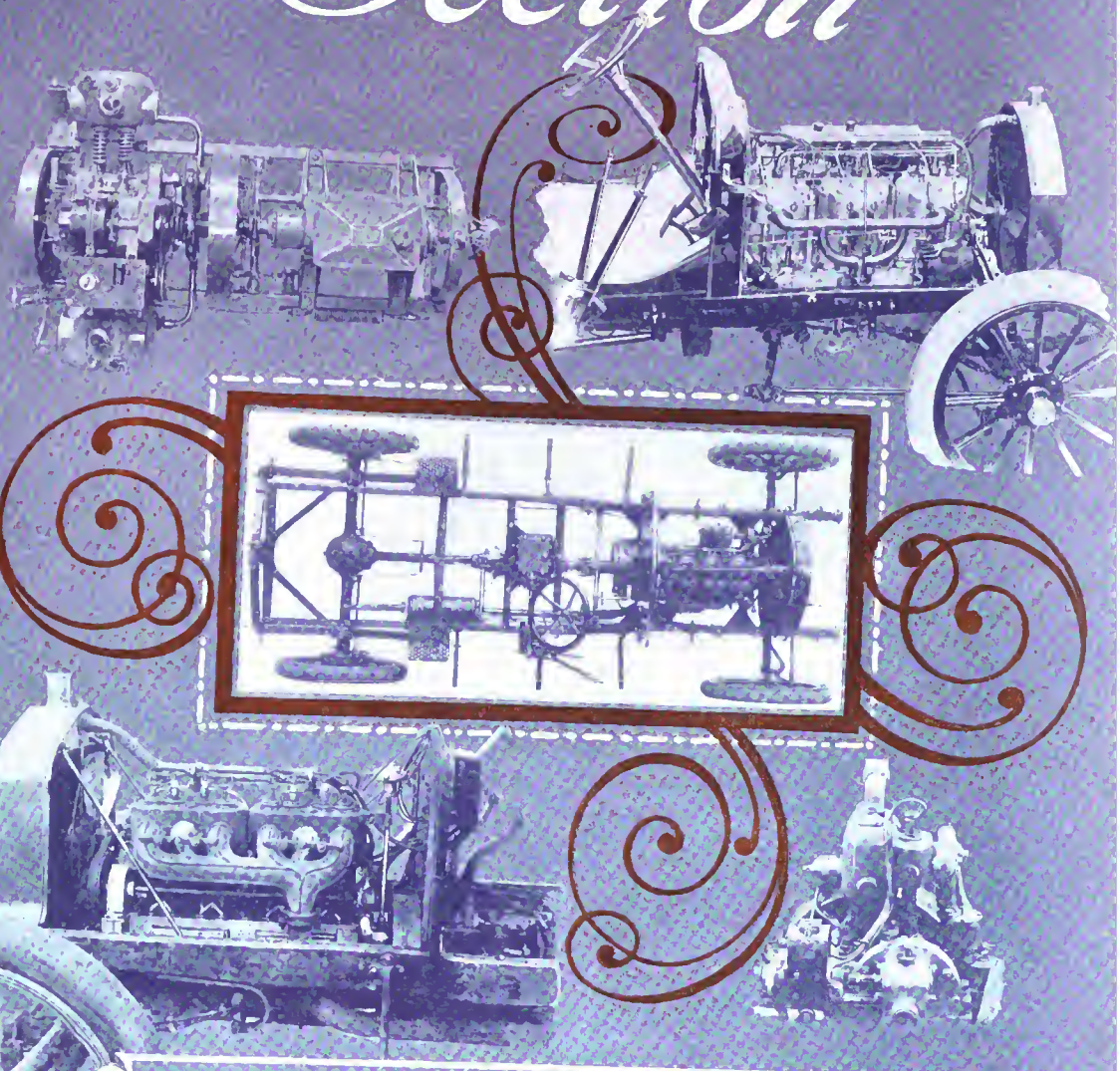
Power Plant Section



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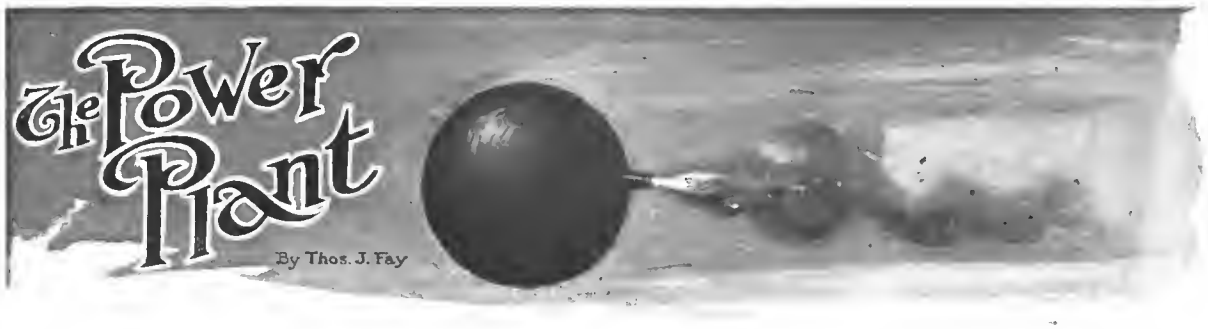


CANDIDLY, the progress made within the last year by way of improvement in the power plants of automobiles was so diversified and in many ways so given to detail as to preclude a thorough attempt at reiteration. There were no radical departures from the beaten paths, however, nor evolutions beyond the pale of conservative practice. The several types of motors in their respective spheres of influence maintain that sturdy and growing importance which is servile to lawful manipulation, and is more nearly invincible to re-occurring and unpleasant happenings than even the most optimistic might have anticipated.

At the beginning of the year the single cylinder motor was looked upon somewhat less favorably than its true merit warranted. The double opposed motor was threatened by the four-cylinder type, and the four, in turn, seemed crowded by the many and undeniable advantages of its flexible neighbor, the six. These apparent controversies proved as chaff before the wind—to be forgotten—in the demand for cars, typical of each of the types of power plants and characteristic advantages.

It seems assured that further experience has established the facts that the earlier defects incidental to the several types of motors were due to vagaries of design, faulty materials and indifferent construction. This last year was one of noteworthy events, due in a measure to the threatening financial situation, which, however, augured for good, in that it produced the incentive ending in a thorough house cleaning.

The live concerns eliminated the faults of which they had become cognizant, revised their methods and evolved among other things power plants for their cars that would seem to spell finality. The earlier complaints were duly weighed, the question of the duplication of parts was rendered more nearly an accomplished fact, and the production of repair parts, both in point of cost and utility, were afforded the due measure of attention to which they were entitled.

The Trend of Motor Improvement.

To fully appreciate the situation it will be necessary to subdivide the power plant and discuss the respective features by themselves. The motor, for illustration, as an abstract proposition, can receive treatment, irrespective of the number of cylinders, since the question of improvements will be the same.

Cylinders Were Perfected.—From the start the cylinders proved to be rather troublesome, and it is to the everlasting credit of the makers of cars that they finally produced motor cylinders quite as free from troubles of any sort as any reasonable person can possibly expect. The improvements did not take root by way of adding weight, indeed; the whole situation can be summed up by saying *they added quality instead.* But this was not an easy matter; the foundries had to be educated up to the exacting requirements, and in the earlier times they refused to stand for the ducking, excepting at a price, which perspicuity was not with a definite assurance from them that the quality of the cylinders would be up to a fitting standard. Time wrought changes, and the last year was the one of marked advances, from the foundry point of view.

In the meantime, patterns were more nearly in accord with the needs of the occasion, and between the more suitable pattern work, the better foundry practice, and the clearness of precision of designers, cylinders were produced in quantity, of great strength and suitable for their respective purposes, whether they were to be water cooled or by an air draught instead.

Crankshafts Are Die Forged.—It was just about a year ago that the crankshaft question was most agitated, for then it seemed inevitable that slabbing would have to be resorted to, in order to make crankshafts of the quality demanded in service. In the meantime, the threatened invasion did have its effect, and the drop forging interests made experiments leading up to what is now commonly termed *toughened drop forgings*, in which the materials have properties imparted to them by special heat treatment, such as were never before known to the automobile or any other industry.

The process was found to be most exact, cheapening in its trend, and fortunately propitious in the time of its coming. This process lends itself equally to such other parts as connecting rods, cam shafts and multitudinous small parts, of which automobiles seem to have a liberal share.

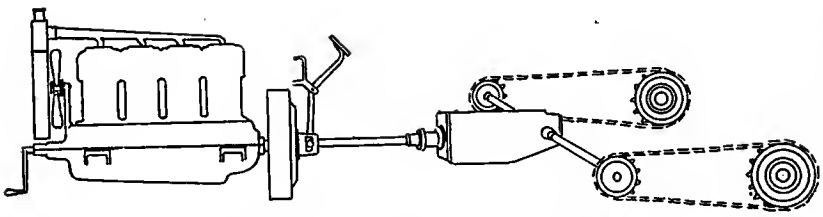
Crankcase and Bearings Related.—Strides have been made in the testing of aluminum, thus rendering it safe and profitable to employ this light and, on the whole, very desirable metal in work of this character. This improvement is one of the distinct advances of the year. In earlier times the aluminum castings were good in the main, but they were not used by some of the makers of cars, because manganese bronze is considerably stronger, but it is considerably heavier as well.

It will be proper to discuss the question of bearings in connection with crankcases, since a bearing *per se* would be of no utility, without a resting place of considerable stability. It matters not at all if the bearings are the one or the other of the available types, when reference is had to alignment, and during the last year this problem was solved to a double purpose. It was noise that brought about the change, for in trying to eliminate noise it was discovered that thin castings defeated the project, in that they were largely responsible for much of the remaining noises in cars, as they were a year or so ago.

To thicken the walls seemed to be a necessity, and this thickening process was of course possible, in view of the very light weight aluminum and, too, in view of the extended use of die (drop) forgings, in that the noises were subdued, and the bearings were kept in more perfect alignment, since the increased thickenss of the shell resulted in increased rigidity of the bearing supports and absence of trouble.

Ball and Roller Bearings.—It was pointed out how the process of eliminating noise resulted in a more stable housing for the bearings. In relation to the bearings, it might be well to observe that the tendency is in the direction of ball and roller bearings up to the limit of the ability of designers to eliminate plain bearings, with their shorter life.

That designers have pursued a sensible and conservative course is rendered manifest by an inspection of the cars of the year; they have not, for illustration, attempted to put ball or roller bearings on connecting rod bearings. When it comes to crankshaft main bearings, they have been guided by broader considerations than the mere question of the utilization of ball bear-



Outline Design of Typical Side Chain Drive Power Plant.

ings for the sake of being able to say that they have them. Such of the cars as employ ball bearings on the crankshaft main bearing position were evidently justified in taking advantage of the excellent qualities afforded. In the types of motors involving plain main bearings for the crankshafts, there were considerations that outweighed the advantages of ball bearings, and the finer qualities of main bearings were employed instead.

When it comes to the transmission gearset, there are few or no examples of plain bearings. The spindles are centered in nearly every case on either ball or roller bearings. When ball bearings are found, they are almost invariably of the radial type; and when it comes to roller bearings, they are largely of the conical type.

Likewise in the axles, the plain bearings are scarcely to be seen at all, while the ball and roller bearings are in great profusion.

The Principle of the Three-Point Suspenaion.—This principle has been extended during the present year to include cars in general. The question of bearing alignment was a strong argument in favor of resting the power plant units on three points, or the equivalent, instead of depending upon the rigidity of the side frames. The mode of the application of the principle is not the same in all cases, but the dominant idea is uppermost in each of the several examples. In some cases the uninitiated would fail to discover the principle of the three point suspension, because in resting the units on more than three points there is an apparent diversion from the principle involved; and the uninitiated would fail to discover that *rigid ties are limited to three points only.*

Speed vs. Power.—In the old days, motors were run at a low speed, and the power was a minimum for a given weight. Gradually the question of increasing speed took a hold, and within the last year this matter was crystalized into short stroke high speed motors, in which the weight efficiency is very high indeed. Remarkable as it may seem, the fuel consumption diminished considerably, although some forecasts were to the opposite view.

The short stroke motors are light; the strength of the component parts would naturally increase because in such motors the parts are short and relatively thick. The deflections diminished and the mechanical efficiency increased as a natural sequence. The mere decrease in the length of the stroke did not at first promise so much as after events disclosed. On second thought it would have been rendered quite plain that increased mechanical efficiency would follow any increase in rigidity, since the way to make a thing rigid is to make it short and thick.

Valves and Timing.—While it is true that the valves are not made of greater area than of the previous practice, it is equally true that the relation of the areas of valves to the areas of cylinders has undergone a change. This change in relation is assignable to the fact that the bore of the modern short stroke motor for a given power is less than the bore as is obtained under the old conditions, but in reducing the bore of the cylinders a corresponding reduction in the area of valves did not follow, hence the change in relation in favor of an increased volume of mixture or power and better cooling conditions.

Dual Ignition Systems.—The new products are so thoroughly fitted out with ignition devices as to preclude any change of justly conducting any of the old line of strictures. The magnetos of the present time are thoroughly scientific, well made and deliver a spark of great energy at the proper instant. They serve every purpose required of an electrical system, excepting for lighting, and it is to be regretted that the magneto system does not seem to lend itself to this important matter.

It is almost unnecessary to point out that the "rotor" of the magneto must change in speed because the magneto must synchronize with the speed of the crankshaft, which shaft rotates at a variable speed. The magneto then cannot deliver a constant electromotive force such as would be required in lighting work. A speed regulator is complicated.

The direct current system of ignition, using a small dynamo, is of course available for the double purpose and is preferred by many on that account. In these days, with the new types of coils, equipped as they are with the "master vibrator," the petty objections to coils are wiped out, and the direct current systems more nearly lend themselves to the problem than ever before. In conjunction with the coil systems, the modern storage batteries make combinations a good second to the magneto, and most cars are fitted out with the dual system. In some cases, because of the splendid advantages of the master vibrator, in conjunction with the coil system, it is the practice to use the storage and the dry cells to the exclusion of the magneto. This scheme is reliable, economical, and the first cost is the minimum for good results.

The Fuel Systems.—At the beginning of the year the question of alcohol was *hot off the grid,* but gasoline is the fuel upon which reliance is placed, with small chance of a change for some time to come. As long as gasoline can be had it will well serve the purpose, and its price will have to more than double perhaps to afford other fuels a chance to compete.

It is pleasant to note that the cars of the present date are fitted out with good and sufficient copper gasoline tanks, of excellent workmanship, involving sweated and riveted joints. It is also observed that, as a rule, a water pump is provided, and baffle plates are placed to prevent the surging of the gasoline in the tank. The fastenings of the tanks are also strong and securely placed, as they should be.

Piping and Fittings.—The new cars, without respect to price, are provided with suitable gasoline piping, which appellation can well be applied to the oil and other piping in and about the cars of the present time. The chances of a stoppage are remote, and the strength of the piping is well within bounds. The fittings are strong, light, tight and of the ground joint class; one may quickly remove a section and, after blowing the same out, replace it without fear that a tight joint will not be made.

Carbureters Reduced to Practice.—The float feed type is still with us, carrying many improvements, mostly in point of detail, to be sure. The trappy, loose jointed and mysterious affairs, once the master of us all, can no longer be found on automobiles. Under the new conditions the needle valves, for illustration, are more nearly tight, and flooding is controllable.

The copper or cork floats are nicely constructed, not likely to become loggy, and means are provided for scavenging the various recesses of the carbureter of such jelly-like aggregations as would of course lend trouble were they allowed to remain.

The float feed type of carbureter is not alone in the field, since there are illustrations of the Krebs idea, and in certain classes of work, notably in connection with the two-cycle motors, injectors are making headway, promising overmuch.

It may be well to call attention to the growing use of the hot water idea of eliminating the refrigerating effect due to the evaporation of gasoline; it works well.

Spark Plugs in Profusion.—Spark plugs were improved in so many ways in recent times that it is a little difficult to specifically enumerate any considerable number of them. Autoists will be interested to know that the grade of porcelain is now up to a standard such as will practically exclude the annoying

ignition failures, once the bane of the spark plug. The packing around the insulation, which may be of porcelain on the one hand and mica on the other, will not be the cause of cylinder leakage in the well-made spark plugs now to be had.

The A. L. A. M. standard thread for spark plugs is now quite extensively adopted, and from appearances it would seem as if the matter will simmer down to one standard thread for all spark plugs, insofar as American cars are concerned. While standards, speaking generally, are difficult to establish, the fact remains it is an important matter when reference is had to spark plugs; an autoist would be able to replace a defective spark plug from the stock of any supply house, however remote from the marts of trade, which facility can only be brought about if a standard thread is adopted.

The Utility of Mufflers.—In the earlier examples of mufflers, if the noise was dampened, so was the power. It required a good deal of effort and some ingenuity to eliminate the noise of exhaust without suppressing the power of the motor. Modern mufflers accomplish this, and they are provided with muffler cutouts, mostly to make a noise.

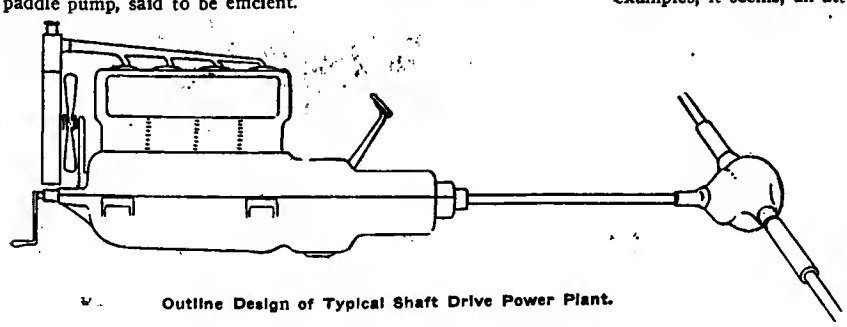
The Cooling Systems.—During the cut and try period it was the system of water cooling that had full sway. Air cooling seems to have been retarded somewhat, possibly because it is a more difficult engineering feat, or, better yet, due to the absence of reliable data on the subject. The splendid service rendered by air-cooled motors, despite the obvious difficulties that beset the earlier designers, has resulted in an astonishing growth of this branch of the industry, contrary to forecasts on the part of those who failed to observe sufficiently close. That the air-cooled situation is on a healthy basis is so well known as not to require comment.

Referring to the air cooling situation, there are two dominant ideas, the one of which involves a direct air blast, while the other affords a greater volume of air over a greater surface, under conditions not so pronounced in point of air pressure. There are differences in details of design of the cylinders, valves and other details, when reference is had to the air cooling method.

Water Circulation.—In this connection there are two fundamental ideas, the one of which takes into account the "thermo-syphon" system of water circulation, while the other involves forced circulation by means of a pump. In the thermo-syphon system the circulation is natural, due to the difference in weight of hot and cold water. The cooler should be somewhat larger if the thermo-syphon system is used, and the propeller blades of the air fan should be most carefully proportioned. That these matters have been taken care of is proven by the fact that the thermo-syphon system is backed up by a horde of enthusiastic autoists, who lay stress upon the absence of the water pump; and such complication as its presence would naturally dictate.

By way of coolers (radiators) there are splendid examples of the respective generic types to be seen at every hand. The cooling ability has been reduced to a fine art, and the weight factor is approximately two-thirds of what it was a year ago. The stability of coolers has been accentuated, and, on the whole, this phase of the situation is truly up to date.

Water pumps are much improved, and among them will be found the centrifugal type, the paddle wheel modification thereof, the gear pump, and of late something by way of an oscillating paddle pump, said to be efficient.



Outline Design of Typical Shaft Drive Power Plant.

Clutch and Flywheel.—These members, while they perform separate functions, are usually in conjunction with each other. The flywheel absorbs the surplus energy and gives it back again when the motor is least capable of delivering power. In this year's products ample provision is made in this respect. The clutch problem, on the other hand, is one involving the control of the speed of the car, with the motor running continuously. This problem is met in diverse ways, prominent among which are (a) multiple disc clutches, (b) leather faced cone clutches, (c) the same with cork inserts, and (d) flat band clutches, with metal to metal. In some of the examples of disc clutches (submerged in oil) cork inserts are used, while in other examples the oil is dispensed with.

Transmission Gear Set.—The gears are of alloy steel in nearly every case; three speeds and reverse holds the center of the stage, and the selective system is very popular indeed. Direct on the high gear dominates the situation, and the entire absence of noise is a conspicuous feature *in high gear*. As a rule, the cars are light enough to stand for high gear on all but the most unworthy roads and on grades, with occasional exceptions, so that the fourth speed is not missed. Certain types of cars are provided with the fourth speed, and in such cases the direct drive may be on third or fourth speed, depending upon the dictates of the designers.

Propeller Shaft.—The shaft drive is most conspicuous, and in the light touring cars of moderate power it is almost to the exclusion of the chain drive. The propeller shaft lines up almost for a straight-line drive, so that the universal joint is not required to transmit at any considerable angle. Radius rods are strong and work on very nearly true centers, so that "cramping" of the rotating parts is conspicuous for its absence.

Jack Shaft.—The differential is on the jack shaft (as usual) and in the side-chain drives, within the gear set housing. In the shaft drive cars the live rear axle takes the place of the jack shaft, and the year's crop of live rear axles are excellent illustrations of the advances made. The floating type is well represented, but the greatest advances were by way of stiff trusses, in the examples of live rear axles using them, although it is worthy of note that the trusses are dispensed with in some cases, involving expanded tubes.

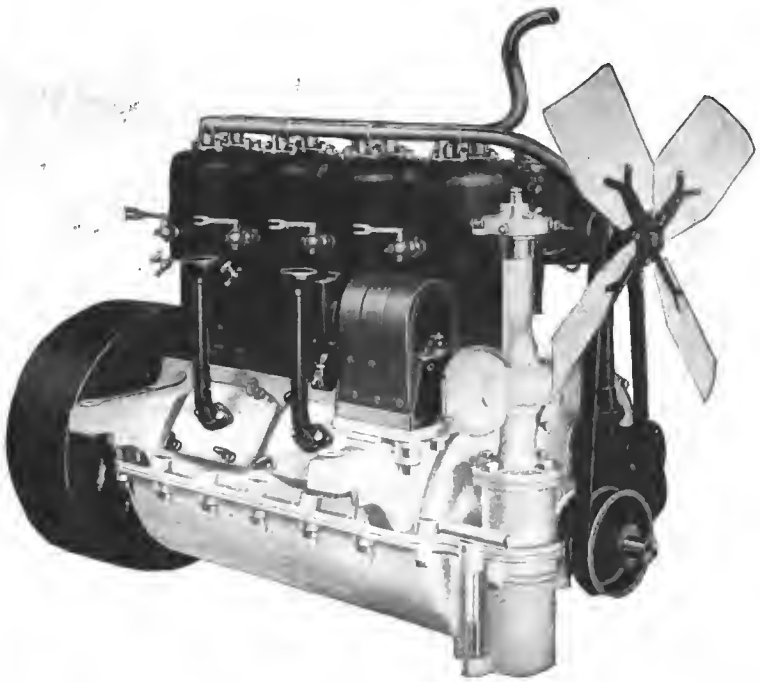
Provisions for Oiling.—This important subject was purposely withheld, since it relates to the whole power plant rather than to the motor alone. Forced feed lubrication is now common, whereas last year it was in isolated cases. A single "tell-tale" is frequently used, and the oil is fed to the vital parts of the motor, to the universal joints, the gear set and, in fact, to every place requiring liquid lubrication, in the best examples.

In place of a small hole, to receive mud *all the time* and a drop of oil *occasionally*, grease cups are used in some profusion, and the saving in repair accounts should be considerable in consequence. The hard lubricant is extended to the gear set and the universal joints. Indeed autoists are fast becoming acquainted with the virtues of grease as a lubricant, not to forget that graphite has its strong adherents as well. It is lubrication that saves repairs, and the makers of cars have put it up to users this year by ways adequately provided for the contingency.

Protection from Mud.—This phase of the question never did receive proper attention until very recently. In the present examples, it seems, an attempt was made to compensate for past neglect.

Perfect Ease of Control.—With the selective speed changing system, clutches free from spinning proclivities, splendid brakes, precision of timing, perfected carburetion, and a nice relation of the motor power to car weight for speed, the autoist is provided with every requisite essential to the control of the present type of cars, whether or no he counts among his accomplishments great skill in the process.

The RUTENBER



1909 Models

4 Cylinder, 4 x4, 25-28 h. p.
4 Cylinder, 4½x5, 30-35 h. p.
4 Cylinder, 4¾x5, 40-45 h. p.
6 Cylinder, 4½x5, 50 h. p.

FITTED WITH OIL-PAN BASE AND EQUIPPED FOR MAGNETO ATTACHMENT

Rutenber Motors were the first four-cylinder motors made and offered for sale in the United States, and met with immediate recognition and have held popular favor ever since and today are the standard multiple cylinder motors with an unprecedented demand, taxing the ability of an immense plant, one of the largest in the country, working night and day, to keep pace with orders. Rutenber Motors are unequalled for power devoloped, smoothness of running and general efficiency. Early arrangements should be made to secure Rutenber Motors in quantity for next season.

Cylinder Castings Our foundry capacity is such that we can handle large orders for cylinder castings promptly—finest castings, uniform, clean and true to pattern. We solicit correspondence from interested manufacturers.

THE RUTENBER CARBURETER

Type A—Vertiole Outlet

Brass and Aluminum Castings

We make a specialty of all kinds of castings in Brass and Aluminum—producing in large quantities. We have unusual facilities in this line.
Write us for full information concerning Motors and Carburetors

The Western Motor Co.

Logansport, Ind., U. S. A.

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HONEYCOMB

Largest Manufacturers of Automobile Accessories in the World

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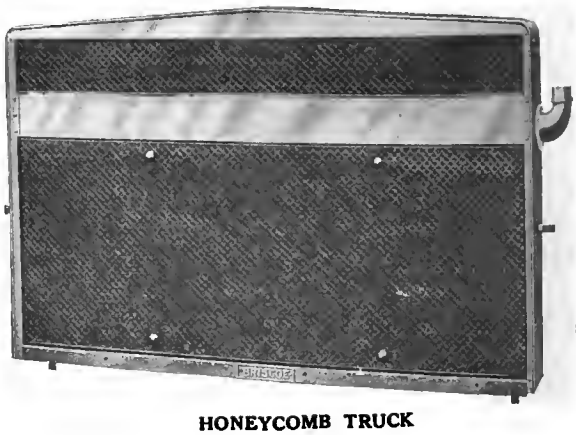
HORIZONTAL TUBE



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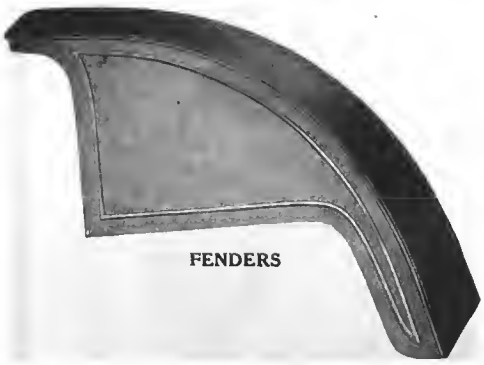

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We Repair All Makes of Radiators

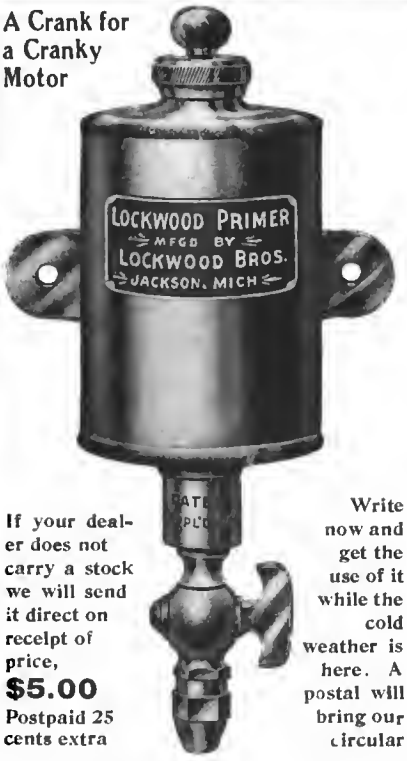
HOODS

Detroit, Mich.

WRITE EITHER FACTORY FOR CATALOGUE AND QUOTATIONS

Newark

A Crank for a Cranky Motor



If your dealer does not carry a stock we will send it direct on receipt of price,
$5.00
Postpaid 25 cents extra

Write now and get the use of it while the cold weather is here. A postal will bring our circular

The Lockwood Primer

When you start your car in the morning, do you crank your head off?

The man who is tired of needless work on the dangerous end of an automobile is the man we want to talk to.

If you were sure you could start your motor so easily that it would be a positive pleasure, you woldn'nt hesitate in having a primer put on.

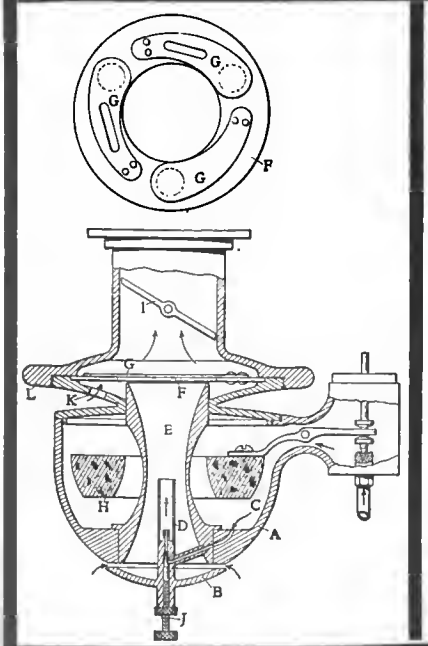
We will guarantee to satisfy *you*, and will give you 30 days to try it. If it doesn't come up to your expectations. return it, and we will refund your money.

Now, Mr. Man, this is not "Bunk." We know it will work to *your* entire satisfaction on *your* car.

If for any reason you do not want it, all you have to do is return it inside of 30 days and you will get your money by return mail.

LOCKWOOD BROS., 103 Pearl Street, Jackson, Mich.

THE BOWERS CARBURETOR



MODEL "G"

A LIGHT, compact carburetor of the Venturi type, designed for use on Automobile, Marine or Stationary engines. It will make engine easy to start, will show good power and speed, smooth running and quick acceleration. It is very simple in construction, having but one adjustment, and is of the highest grade of manufacture. We are willing to submit carburetor subject to inspection and trial and will guarantee its action to be absolutely satisfactory.

We furnish our Model "G" Carburetor in 1 inch, 1¼ inch and 1½ inch sizes, with either vertical or horizontal outlet and flange connection. We are in position to make prompt deliveries in any quantities.

Special prices to manufacturers.

PRICE, complete, 1 inch and 1¼ inch sizes . . . $10.00
1½ inch size 12.00

AGENCIES:

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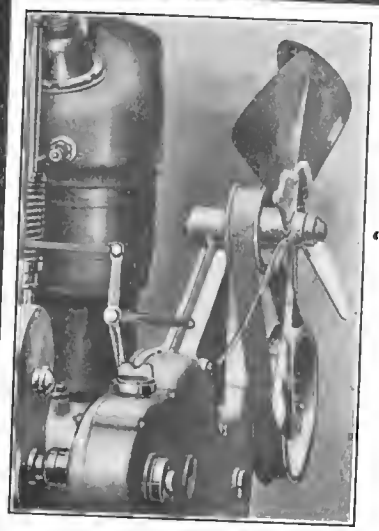
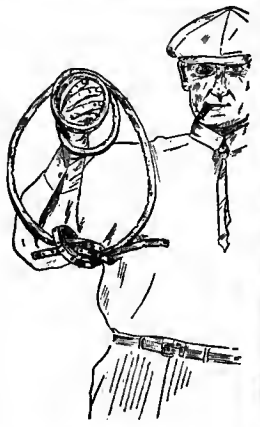
THE F. E. BOWERS COMPANY, NEW HAVEN, CONN.

New York Office, 1691 Broadway - A. H. GREEN, Mgr.
Chicago Office, 1436 Michigan Ave. - F. E. SPARKS, Mgr.
Eastern Sales Representatives, WHITE & VON WETTBERG, Hartford, Conn.



A.S.O. FAN BELTS FOR AUTOMOBILES



"The Perfect Belt"

No slip, positive in action; heat, oil and waterproof; made in all sizes, both flat and V shape; thousands now in use on **Packard** and other high-grade cars.

You take no chances, we guarantee the A. S. O. belts to give perfect satisfaction. Clutch troubles are eliminated by using our chrome tanned leather which we guarantee will not slip and is impervious to water or oil conditions. A. O. S. leather is used by the leading makers of American Cars.

The A. S. O. Transmission belt for motor cycles

makes the cleanest smooth running transmission to be had; it will hold, it wont stretch out and need continual tightening. It is proof against trouble from water or oil; is long lasting and not costly in the first instance. May we send particulars?

American Belting and Tanning Co.

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The Carbureter that Eliminates Trouble

It is designed with this one object in view—to overcome the objections found in other carbureters—AND IT DOES IT. It excels all others in every point of comparison—it is the perfection of carbureters—and you automobile owners and manufacturers who want the BEST must inevitably adopt

The WATT-DETROIT

BALANCED FLOAT CARBURETER

It is a new principle and design and "makes good" under every test—regardless of speed and atmospheric conditions. In your own interests investigate this. WRITE TO-DAY. We will cheerfully furnish full detail information.

The Watt-Detroit Carbureter Co.
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NEARLY EVERYONE KNOWS

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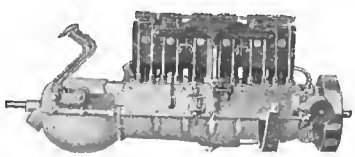
BROWNELL MOTORS

for 1909 are Eminently Superior in design, construction, power, economy and in perfection of details.



Power Unit 6-Cylinder, Model A, 20-25 H. P. Automobile Motor

This complete power unit (in both 4 and 6-cylinders) is unqualifiedly the most desirable proposition on the market, for the Automobile Manufacturer or Assembler.

Hence It's Great Popularity.

Our line embraces Motors for a great variety of purposes. In 4, 6 and 8-cylinders, from 14 to 150 H. P.

A Postal—A Catalogue.

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LONG DISTANCE

LONG'S RADIATORS

are the only ones on the market that can be repaired when an accident is met with. Any broken tubes can be replaced with new ones at a small expense. Other makes of radiators when damaged must be entirely replaced at a heavy expense.

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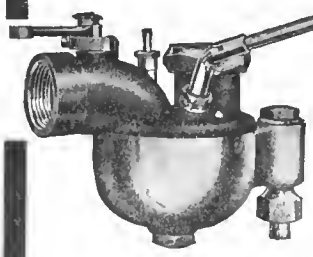
LONG MANUFACTURING CO., Chicago, Ill.

THE DASHBOARD ADJUSTMENT

OF THE

Holley Model W Carbureter

An automatic carbureter is one that adapts the gasoline feed to the air velocity, so that the correct mixture is produced under all conditions of speed and throttle opening. Such a carbureter is the single-adjustment **Holley Model W**—the simplest automatic carbureter in the world.



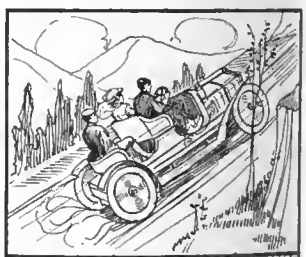
But the best automatic carbureter cannot adapt itself to changes in gasoline density, or in humidity, or to the gradual warming up of an engine started from "cold." If you would have your motor tuned to concert pitch always, slight day-to-day adjustment of the carbureter is essential.

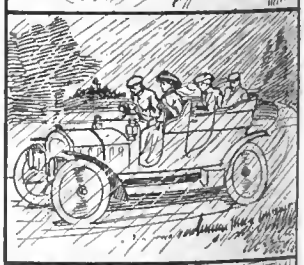
With the single adjustment HOLLEY, this delicate tuning for maximum power is done instantly—while the car is running—without guesswork or experiment. A rod connected by universal joint to the needle valve passes through the dash, and ends in a graduated, ratchet-held dial. You bring the car to road speed—or on a hill if you prefer—and turn the dial handle a little to right or left till the motor pulls strongest—and the trick is done.

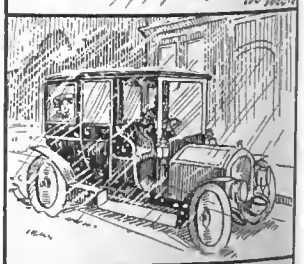
There's no "maybe" or "perhaps"—no speculating as to whether it's the spring tension or the spray opening that needs changing—no trial setting followed by a run to find whether it is right or not—no uncertainty about any point of the procedure. The float level, once set, is never changed; and the needle valve is the ONLY other thing about the carbureter to adjust.

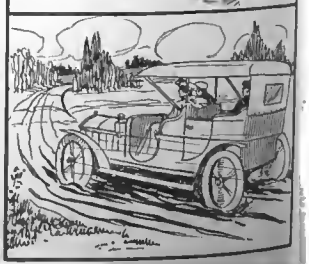
Regular Top or Side Outlet Models	
¾"	$7.50
1"	7.50
1¼"	8.00
1½"	9.00

With Universal Joint and Dial Adjustment—Top or Side Outlet	
¾"	$10.50
1"	10.50
1¼"	11.00
1½"	12.00









HOLLEY BROTHERS CO., Detroit, Mich.

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Pacific Coast: San Francisco, Calif., Geo. P. Moore & Co.; Los Angeles, Calif., Geo. P. Moore & Co.; Oakland, Calif., Geo. P. Moore & Co.

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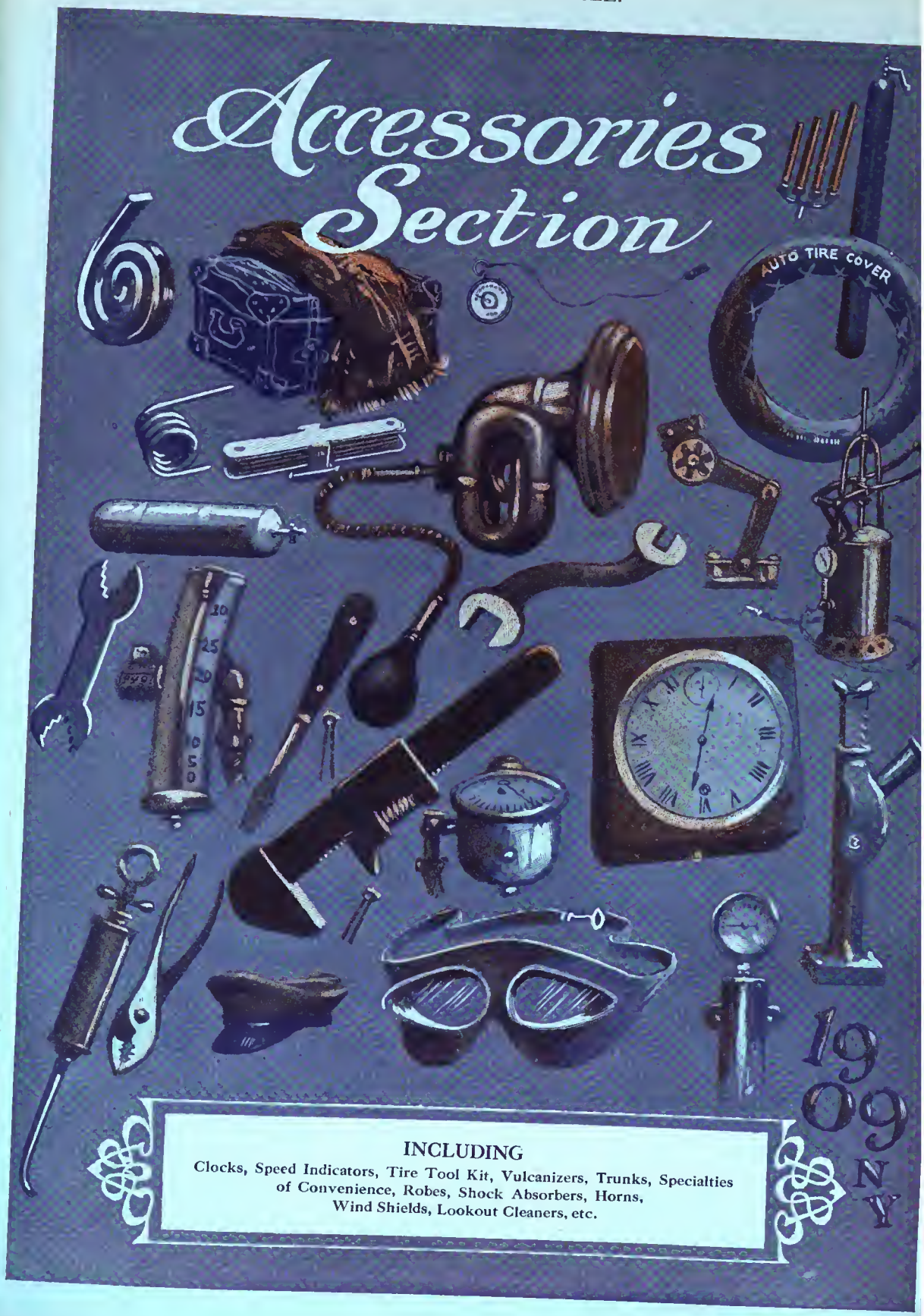


Importance of High Grade Accessories

INTELLIGENCE displayed in the operation of automobiles should be by way of the use of proper accessories. Nothing but hands with which to cope with some unruly part of a car, under conditions remote from the haunts of the repair man, is pretty nearly sure to end with nothing but a borse to move the car. Conceding that automobiles are less prone to troubles than they were during the constructive period, it is well to be prepared when a difficulty does arise and emphasizes the need of good facilities.

Something by Way of a Tool Kit.—When it comes to the selection of the small tools to go into the kit for road work, quality should certainly take precedence of quantity. Wbile it is to be hoped that no man will ever again own an automobile so designed that it will be impossible to get at the adjustments, the fact remains that the tool kit should include the very tools best suited to the given automobile. If socket wrenches are desirable in a given case, care should be exercised to select a substantial set. At all events a complete set of "S" wrenches will be found desirable and a good-sized pipe wrench will be necessary under certain severe conditions. A tool kit would be incomplete without a selection of monkey wrenches, snips, pliers, chisels, punches, drills, a dog or two, perhaps a heavy pattern pin-vise and a variety of files. A set of taps and dies, with a selection of bolts, an assortment of rivets, some solder and a blow lamp must all be included in an equipment if the autoist is to be confident and independent.

Fittings and Tools for Coping with Tire Troubles.—The ordinary "necessaire" included with cars is not sufficiently complete to enable an autoist to cope with tire troubles on an extended basis. The tire irons should be of good material and adequate section and the shape should conform to the requirements, differing somewbat on tires used. In former times a malleable iron "toothpick" lent zest to invective when autoists attempted to remove a tire case, especially if it had been in place long enough to adhere to the rim. The irons (toothpicks) were not long enough or strong enough or shaped for the work to be done. These details have been corrected to a very considerable extent, but it is always well for the individual to equip himself in a manner to suit his especial requirements. By way of repairing punctures, there are special patches to be had and fine grades of cement to be used with them and an "acid cure" that will aid to a marvelous extent by way of a permanent repair. Patches put on without any vulcanizing at all will not stay on if the tires heat up, which they do. In addition to these facilities there are tire chains that increase traction on these severe conditions and there are repair facilities such as enable the autoist to get home on a casing after a blowout. Of jacks there are a great variety and there is no gainsaying the fact that a jack is of the utmost importance. Moreover, it is well worth while to provide tire-saving lifts by which cars may be lifted off the tires when they are on storage. Tires are damaged if they stand in one position for a considerable time unless they are permitted to assume their natural shape during tbat time if it is long.

Means for Inflating Tires.—The mileage that can be attained on the tire depends primarily upon the quality of the tires and the weight of the car in relation to the tire dimensions. These are matters to be settled in selecting cars, but after the selection has been made there is the further question of the inflation of the tires sufficiently for the purpose. An ordinary bicycle pump will not do at all, nor can it be said that a fair-sized "compound" hand pump will be up to a fitting standard for larger sizes of pneumatic tires. Makers, realizing the need of the occasion, had introduced divers forms of air pumps that are light and suitable for the purpose, including automatic engine-driven pumps attached to frame of car. Then again the compressed inflating gas tank has come into vogue and it serves for inflating the tires to a very satisfactory degree. The inflating gas may be carbonic acid which is in the liquid state of abregation in the tanks; this liquid will be under a pressure of approximately 1,200 pounds per square inch, which pressure changes with the temperature of the cylinder. As the surrounding temperature increases, so does the pressure, and for this reason it is always desirable to keep the tank in a cool place. The fact that carbonic acid is stored in liquid form is an assurance that the capacity of a relatively small tank will be capable of inflating a set of tires a considerable number of times.

This idea is a little new and tires are sufficiently expensive to engender caution when it comes to anything that might tend to deteriorate the fabric or the rubber. Autoists when they take to the use of tire inflating tanks are a little prone to question the qualities of inflating gases, due to the fact that carbonic acid, for illustration, will seep through rubber at a rate somewhat faster than that of air. In the absence of definite knowledge upon the subject, they naturally become perturbed and hastily arrive at the conclusion that the tubes are damaged in the process. Not so; the carbonic acid will stay in for a sufficient time to render the process practical and the concensus of opinion of tire makers (whom the author has consulted in relation to this matter) may be reduced to a few words as follows: Carbonic acid is just a little less likely to damage rubber than is atmospheric air. True, it will not stay in a tube as long, but it does not alter the structure of the rubber in its passage through the walls. As before stated, this is a matter of no great moment because the carbonic acid is inexpensive and obtains in the tanks in the liquid form under such high pressure that it is perfectly easy and simple to inflate the tires to the requisite hardness with but little effort.

The inflating tanks are made sufficiently strong to insure a large factor of safety and, again, the control of the exuding gas is not difficult because the liquid will not burst into gas at a high rate of speed. The idea, then, that the tires might be damaged by an inrush of gas at a high pressure is without foundation. Moreover, the needle valve is suitably designed with a very small orifice. which is a further assurance of safety as

against excessive pressure in the tires. On the other hand, it would be the height of fallacy to turn on the gas and go away; obviously the pressure would increase sufficiently to disrupt the tire within a short time.

Accessories to the Fuel System.—Gasoline is hungry for water, but the water should be separated out in the process of filling the fuel tank; foreign substances should also be removed. Funnels are made for the purpose, including a fine mesh sieve and a chamois skin water separator. The chamois skin will permit gasoline to pass through readily; not so with water. Likewise with the water-cooling system, foreign substances should be excluded if the chamois skin is demountable; the same funnel plus the sieve will serve to exclude foreign substances from the water.

The Utility of Shock Absorbers.—Classing shock absorbers as accessories it is even so desirable to emphasize their utility. No matter how good the spring suspension may be, there are conditions under which shock absorbers will pay for themselves by aborting spring breakages. And they have other advantages, among which we might mention a greater average speed on ordinary roads and more agreeable conditions of riding. Then, again, tires are not subjected to such great strains if the bouncing of the body is restrained. It is difficult to estimate the saving in tires due to the presence of shock absorbers. Shock absorbers are made in a variety of types, and it would seem from the extended use of the several types that utility resides in all. It would be reasonable to assume that the application should be consistent with the requirements and wisdom indicates that the conditions be considered as preliminary to the selection of the particular type of shock absorber.

Importance of a Signal System.—The approach of a car should be heralded in a suitable manner, and this is only possible if a siren, horn or other suitable equipment is provided. Ethically too much noise is objectionable, but there are conditions under which the right kind of noise in considerable volume will be justifiable. This important branch of the automobile accessory situation is admirably represented in divers ways with sirens, horns, etc., in great profusion. It is not believed the muffler cut-out should be regarded as a suitable noise system because it is not specifically placed with the idea of signaling the approach of a car and pedestrians might not pay attention to the noise of a muffler cut-out because of its non-specific character.

Measurements of Speed and Distance.—It is extremely important to be able to ascertain the speed at which a car is traveling. The autoist cannot tell if he is violating the speed laws if he has no means by which he can determine the speed at which the car is going. Barring instinct, it is impossible to estimate the distance in which the car can be stopped without knowing how fast the car is traveling. The distance in which motion can be arrested, if a traction system is involved, follows a natural law; in other words, the motion of a car can be arrested within the distance a car can be accelerated if the maximum tractive force is a maximum during the period of acceleration. Obviously the accelerating rate cannot exceed a certain point because the tractivity of wheel is limited. Equally true, the rate of minus acceleration is limited by the ability of the traction wheels. Instinct serves very nicely in the absence of instruments of precision with good judges of distance, but the automobile is used by people who are not good judges of distance, and it is desirable that they utilize the speedometers in order that they will know how fast they are traveling at any given time. It is also well to know the accumulated distance the car may have traveled, and it is a decided advantage to be able to ascertain at any given moment the distance traveled on a trip. These matters are all taken care of by competent speedometers geared to the front wheels of cars with the dial of the instrument located to intercept the eye of the autoist.

Accessories to Personal Comfort.—Until wind shields are made a regular equipment in connection with bodies of automobiles they will have to be classed with accessories. As a matter of fact, these same wind shields come pretty near to necessities, and it is pleasurable to note that they may now be had in several forms, serving well their intended purpose.

Coming down to the more nearly personal questions, there is the question of goggles. They should be close fitting, easily adjusted, and they should stay adjusted. There are divers forms of goggles, some of which embody the mask idea, and the selection is largely up to the personal ideas of wearers.

There is one other question which is probably overlooked by autoists of no great experience, *i. e.*, the matter of wraps and robes. The way to keep comfortably cool on a hot summer's day is to ride at a fair rate of speed in an automobile, but under conditions of inclement weather it is plain to be seen that the very fact that one can keep cool on a hot day indicates that one will be cold on a cool day. Lap robes and other wraps are, therefore, extremely important and, strange as it may seem, the old conventional idea in connection with the horse-drawn vehicle were found valueless for the purpose. The wearing apparel in connection with automobiles was not reduced to its present form merely at the behest of a style maker. It was found necessary to depart from the conventions in this respect in view of the conditions wrought. Rain seems to have the special property of getting through everything but a thatched roof, and this property of rain is much accentuated when reference is had to automobiles in a storm of this character. A provision by way of storm curtains and waterproof wearing apparel is something that is overlooked sometimes, but it is of the utmost importance, and it is a matter that has been given exceeding attention by designers of accessories of the automobile.

There is one other matter that augurs for personal comfort, *i. e.*, a timepiece is generally placed on the dashboard so conveniently situated as to enable the occupants of the car to tell the time of day at will. This may seem to be a matter of no great moment in view of the universal use of watches, but it must be remembered that a watch is rather inaccessible under a top coat, especially if one has gloves on. It is much easier to glance at the timepiece on the dashboard. In town cars and in limousines the timepiece is placed flush in a case accommodating letter paper, pens, ink, blotter, etc.

In some notable instances cabinets are included.

Everything but the auto includes a vast list, the mention of which requires a catalogue. In the meantime it is fair to say that some of the accessories, so-called, are as necessaries. Windshields, for illustration, can be regarded as accessories, and yet without them speed is even disagreeable. On a rainy day without a windshield it is impossible to keep dry, and if the road is dusty the windshield is necessary to safety. If goggles are used, and they are of a suitable design, the question of "insects" reduces to the tolerable, although windshields and goggles are more nearly in accord with the requirements.

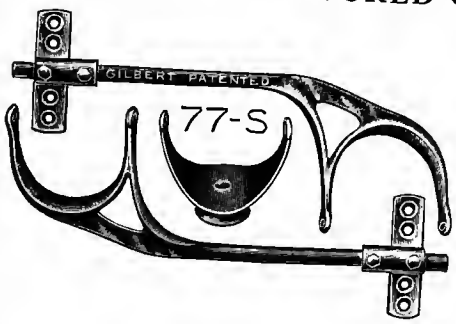
If the day is cold, steering becomes a task, since the wind will make its way up one's sleeves in the absence of gloves, or with them if the gauntlets are not so shaped as to go over the coat sleeve. Storm and cold protectors are to be had in the various designs as dictated by experience, which, together with fur-lined "over-pants" and such other means as are now available, renders winter touring pleasurable. Coats with flaps and button edges serve well their purposes, and military chestcoats are as good for the autoist as they proved to be in the service of the military.

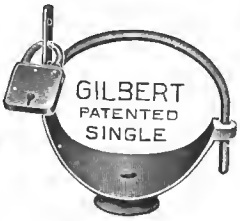
If the weather is inclement, or if the roads are bad, it is then that tire chains show well their advantages. In the absence of, or even with chains, the several forms of "non-skid" covers are well worth the careful attention of the discriminating autoist.

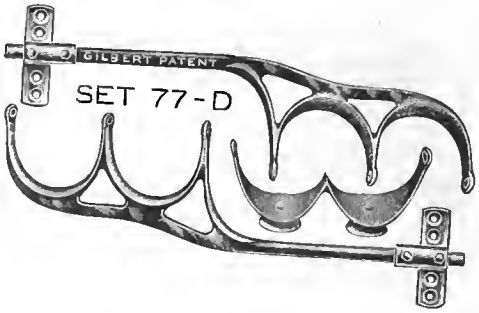
But if it is desirable to be able to travel in bad as well as in good weather, over rough as well as poorly kept roads, it is equally well to know how far you go. The available instruments of precision to be had are as reliable as any device can be and they serve well the intended purpose. They not only tell the tale of the total distance for the car, but they tell of the individual trips and give the instantaneous value.

Gilbert Motor Car Accessories

KNOWN THE WORLD OVER AND ACKNOWLEDGED THE BEST



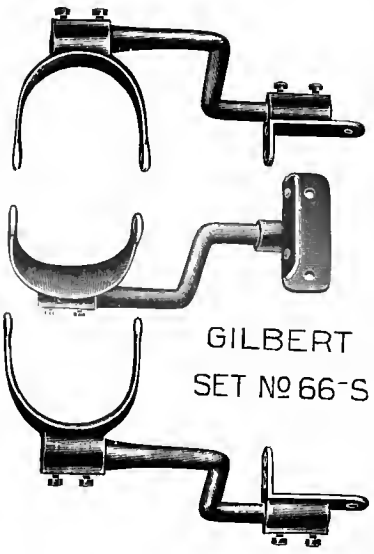


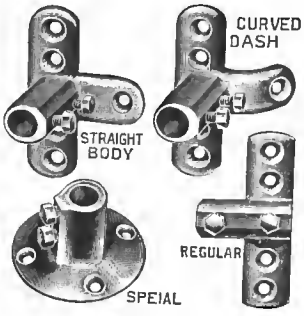


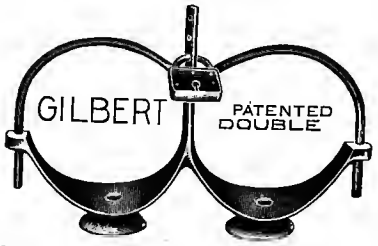
Styles Wire Edge

Styles Buttoned Fastened

Price, $3.50







CATALOGUE READY FOR DISTRIBUTION

Our full line will be on exhibition at following shows: **Grand Central Palace, space No. 158, section V, first gallery. Madison Square Garden, space No. 108, elevated platform.**

We cordially invite our friends and customers to make themselves at home in our spaces during the show weeks.

The GILBERT MFG. CO., NEW HAVEN, CONN.

Price Auto Gloves

The Price Automobile Gauntlet possesses a number of exclusive points of superiority over other makes. Longer in both gloves proper and gauntlet cuff, the latter is not only wider when closed but is, as well, fitted with a folding gore which unclasps to admit the most bulky overcoat. It is the only gauntlet made which is specially reinforced where the wear comes—between the fingers and around the thumb. The wrist has a solid leather snap-strap. Lined or unlined. Price, from $2.00 to $10.00 per pair.

The Price Short Length Automobile Glove is a favorite for drivers who do not want a gauntlet cuff. It is fitted with a solid leather snap-strap at wrist and may be had either lined or unlined. Price, $2.00 to $4.00 per pair.

The Price Ventilated Automobile Gauntlet is made with a special ventilated back which effectually protects the hand of the wearer from the discomforts of perspiration. The greater part of the natural warmth of the hand is retained and still sufficient ventilation is allowed to permit the entrance of a cool, dry air, thus maintaining the normal body temperature. Made in horsehide with gauntlet cuff. Has folding gore equipped with two clasps and solid leather wrist strap with our special snap. Price, from $3.00 to $4.00.

WHAT are the points for which you look when you go to buy a new pair of auto gloves?

First and foremost comes quality, doesn't it?

And then there's style and comfort.

How about it—have you discovered the gloves that exactly fill all of these requisites?

If you haven't found the glove you want, you haven't tried Price Automobile Gloves.

Price Automobile Gloves are made by particular people for people who are particular.

Stop a moment and think that over.

Then let us explain just what it means.

First, there is the question of quality.

Price Automobile Gloves are made from genuine washable Horsehide leather.

We picked Horsehide for a reason—it is the leather we would use for gloves for our own personal use and it makes gloves that we are not afraid to back up with our reputation.

If you realize what our reputation means to us, you will realize how good Price Automobile Gloves are.

There's no cape nor sheepskin stock in them, no paper linings. There's nothing but Horsehide — straight Horsehide all the way through.

But Horsehide affects more than the wearing quality of a glove; it has a whole lot to do with the fit as well.

Wet weather or rain won't affect Horsehide. There is no shrinking nor stretching. Price Automobile Gloves hold their shape.

Just figure on the importance of that.

And then there is the matter of style and comfort.

Space here won't permit our telling about these points in detail. But we might just say that Price Automobile Gloves are made to the shape of the human hand and are as dressy as it is possible for gloves to be made.

What's more, their style is of the type that has to do with full lengths in the parts of the hand where it is needed. You will find Price Automobile Gloves models of comfort.

The Price One-Finger or full Mitten, for example, is one of our favorites. It allows the hand all necessary freedom, and being lined with extra heavy Imported Lambskin, is exceptionally warm for winter wear. Price, **$2.00** to **$8.00** per pair.

Price Automobile Gloves are tanned in reindeer, pearl, black, tan and buckskin colors—in the exact color you want.

They can all be had lined with Imported Lambskin or Blue Rabbitskin. Incidentally, it might be mentioned that our Fleeced, Knit Lined Seamless Finger gloves—practically one glove within another—are mighty warm and comfortable for winter wear.

On request we will be glad to send our catalogue showing the complete line.

TO DEALERS: We want reliable dealers to handle our line. Write for special proposition to the trade.

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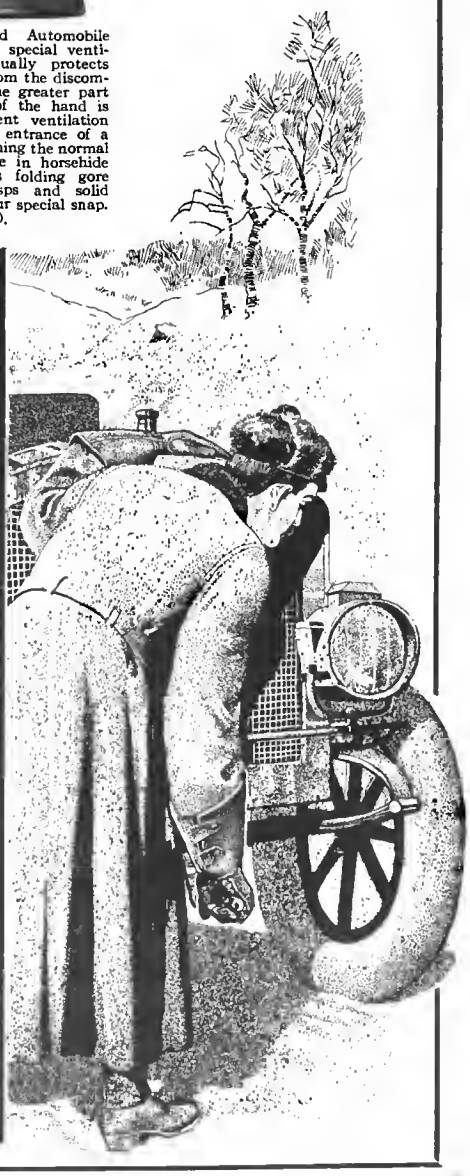
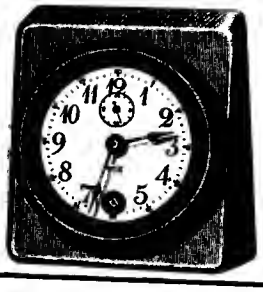


Domestic Auto Specialties



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— 8 DAY —

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"YORK" CLOCK
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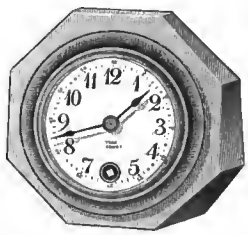
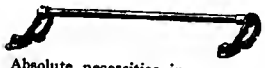
Heavy polished hrass case. Dial measures 2¾ in. Size, 4 1/16 in. across. Price, $7.50.



FOOT RESTS



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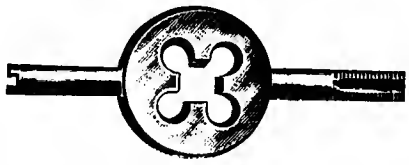

With it you instantly unscrew the valve inside of any Schrader valve. With the die you can at any time cut a new thread on the outside of the valve and with the tap you can cut a new thread on the inside. This little accessory is the handiest thing for this purpose ever put on the market and should he in the tool kit of every automobilist.

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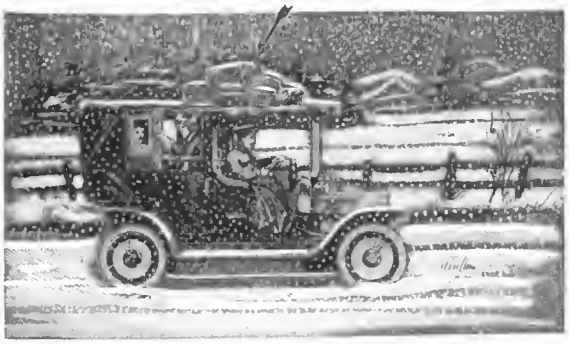

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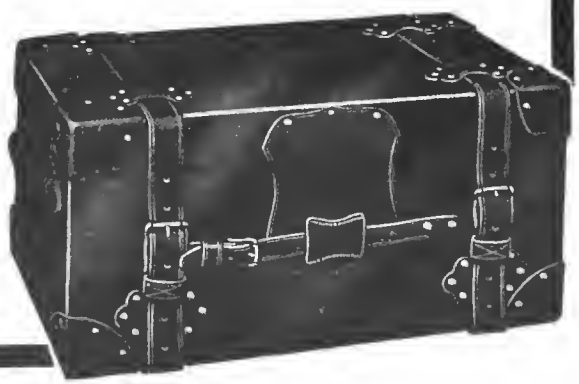

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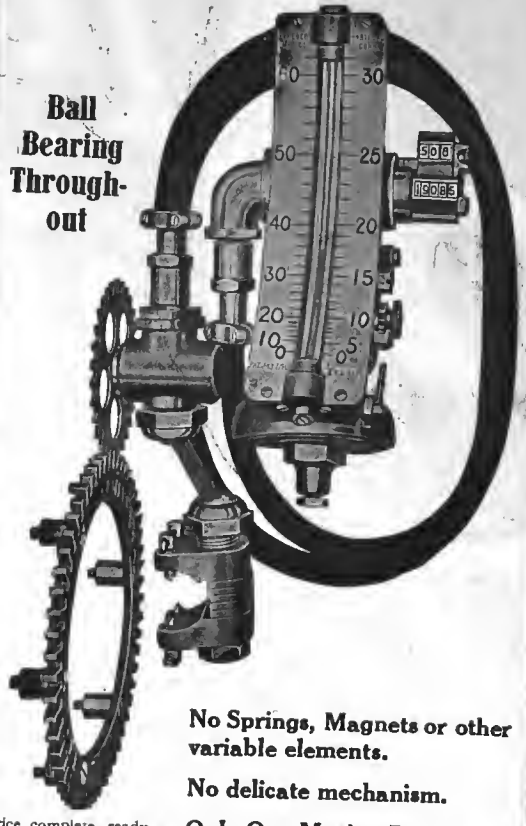

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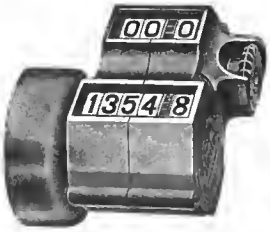

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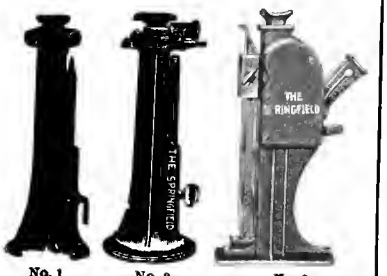

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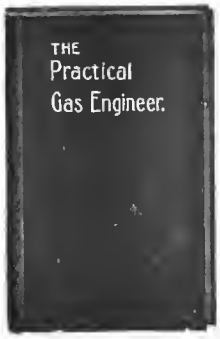

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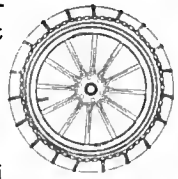

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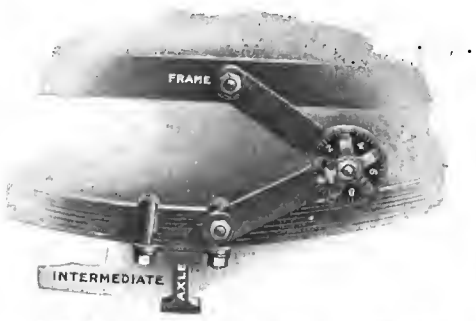

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HARTFORD SUSPENSION COMPANY

140 Bay Street, Jersey City, N. J.

Branches: NEW YORK, 212-214 W. 88th Street
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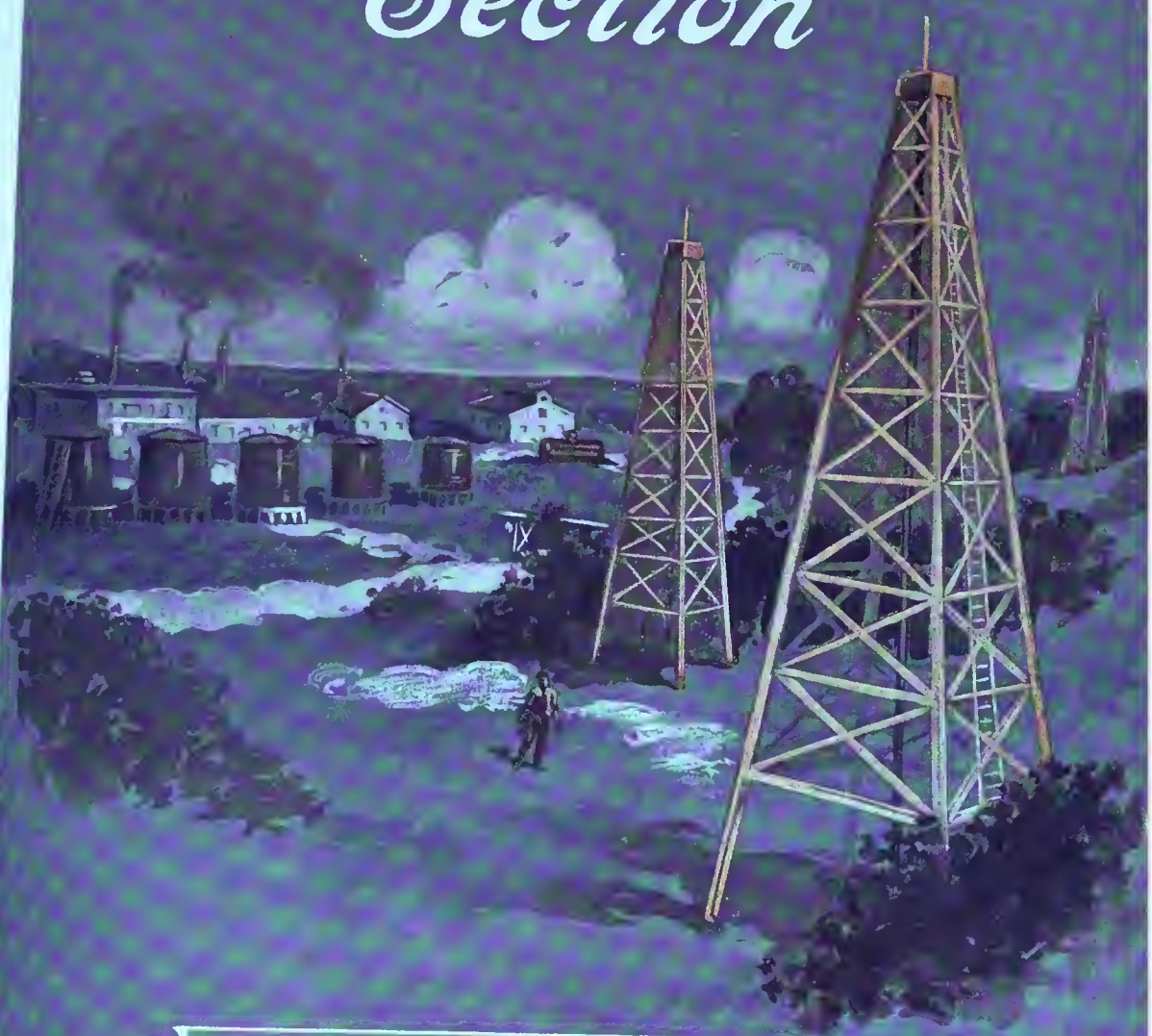
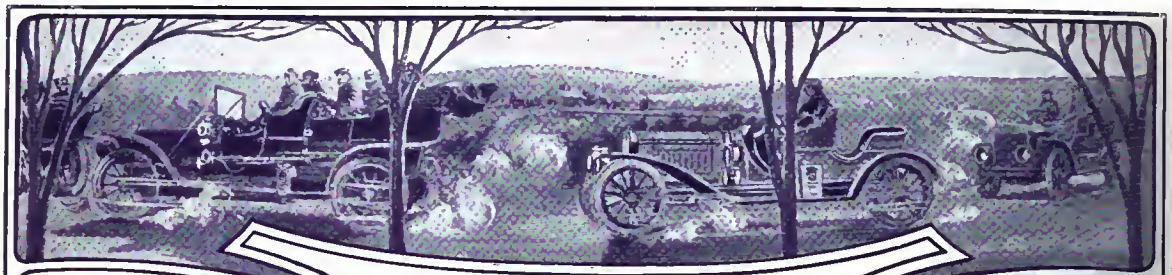
Lubricating Section



INCLUDING

Lubricators, Pumps, Tanks, and Lubricants, as Oils, Greases, and Graphite.



KEEP UP WITH THE PROCESSION

USE Oilzum

START THE NEW YEAR RIGHT

FOR ALL MAKES OF MOTOR CARS

IT LUBRICATES

IS GUARANTEED TO KEEP

PLUGS, VALVES, PISTONS AND CYLINDER WALLS CLEAN

INCREASES

POWER

BEST BY EVERY TEST

MADE AND SOLD IN CANS, BARRELS AND CARLOAD LOTS BY

THE WHITE & BAGLEY CO.
WORCESTER, MASS.
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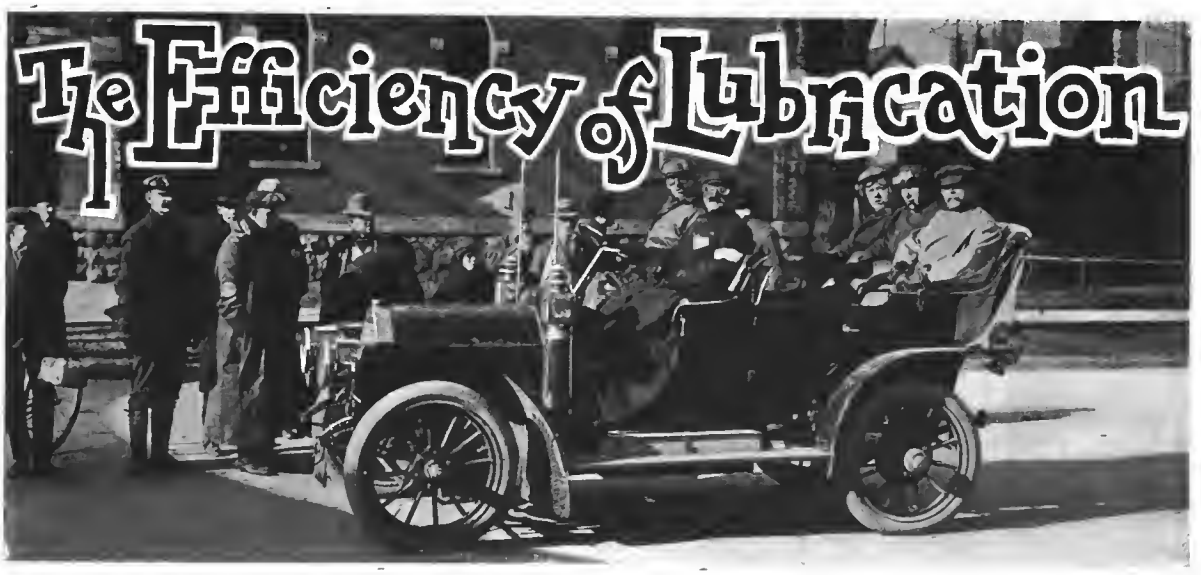
WE ARE GIVING AWAY SOMETHING USEFUL FOR YOUR CAR. IF YOU WANT ONE, SEND THIS COUPON

The Efficiency of Lubrication



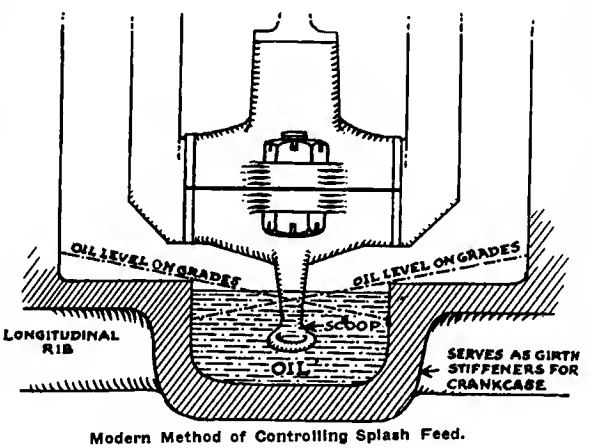
IF the thickness of an oil film is one thousandth of an inch, a single drop of oil will cover about two square inches of surface. This drop of oil will, while it stays on the surface, do all that can be done by way of affording the slippery surface wanted, and prevent the metals from contacting. No quantity of oil can do more, and good oiling facilities consist essentially in the device that will replace that drop of oil when it ceases to extend the unctuousness desired or if it is squeezed out of place. On this basis, a cubic inch of oil will lubricate over a thousand square inches of surface, or replenish the supply on a square inch of motor bearing surface once for each revolution for a minute of time.

Lubricating products are valuable on two accounts, *i.e.*, the cost of good lubricants is high, and the cost of repairs, if lubricants are not good, is higher.

Splash Systems of Lubrication.—There is nothing much to be said in favor of the old-fashioned splash systems of lubrication, but the modern splash system is not the crude proposition that those who do not keep abreast of the times would seem to think. In the modern system the connecting rod does not splash the oil at all; on the other hand, a little scoop dips into the trough of oil and scoops up a small quantity. The trough is kept full by a single circulating (gear) pump, and the overflow goes to the "sump"; in other words, the well.

The Force Feed System.—This is the system that positively replaces "the drop of oil" as it wears away under the pressure to which it is subjected. This system consists essentially of snap piston (plunger) pumps, as many as there are places to oil. The pistons are drawn back against the spring, and when the "suction" or "flooding" stroke is completed the plunger is cast free, and under the impetus of the stored energy in the spring the plunger snaps back, forcing a definite measure of oil directly to the surface to be lubricated. Great reliance is placed on this system, and it is much used.

Feeding Oil Under Pressure.—In this system an oil container is connected by a system of piping to the bearings to be lubricated. Pressure is put on the container and the flow of oil is regulated. If good oil is used—and it should be—the system works.



Modern Method of Controlling Splash Feed.

Vacuum System of Lubrication.—In this system the oil is held in a chamber adjacent to the crankcase, and by a system of piping a balance is so maintained that atmosphere is admitted as oil flows out. The oil chamber is held at a partial vacuum. As in the pressure system, if good oil is used, the system is not likely to clog up.

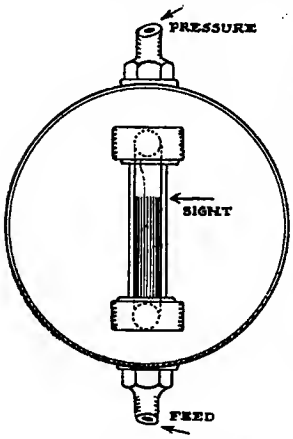
Feeding Solid Lubricants, Grease, Etc.—Solid lubricants are placed directly in the transmission case, wheel hub caps, timer cavity, and universal joint housings. The small bearings are provided with grease cups. In some cases the solid lubricants are fed through a system of piping, under pressure.

Characteristics of Lubricants.—Unctuousness is the prime property. If the oil will not afford a slippery surface, it is of no value, unless to act as a "dog in the manger" while the bearings heat up and "freeze." Anything in the oil that supplants unctuousness is detrimental, since it displaces the very property for which oil is used primarily; soapstone, chalk, talcum, or any other (so-called) body maker is, therefore, an adulterant that can have no honest place in a lubricating medium. Body, next to unctuousness, is of importance, since oil has a duty to perform aside from furnishing a slippery surface. The metals must not be allowed to come into contact with each other, and the requisite body must be there to enable the oil to sustain the pressure. Mobility is also a property that should be well regulated, in view of the arduousness of the service, and, too, the mobility should be constant. If the oil lacks mobility it will flow sluggishly, and may not be able to flow freely into the surfaces to be lubricated. Mobility should not be much affected by temperature changes. Acidity in lubricants is the bane that leads to grief. The costly ball and roller bearings are ruined by acids, and in plain bearings the polished surfaces of the spindles and journals are ruined. Acidity may be due to a faulty process, or it may be the product of reaction in the materials used. Heat and light in the presence of atmosphere seem to be all that is necessary to render the average "animal fat" acid in its reaction within a short while after it is compounded.

A residue after combustion is very undesirable; nor does it matter if the residue is carbon

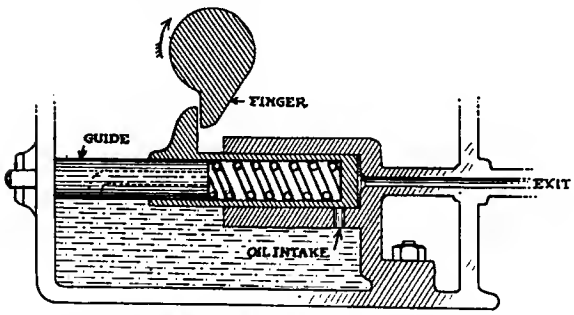
alone, or carbon and other "ash" producing elements. Cylinder oil is ultimately burned, and the products of combustion should be gases, not solid non-combustibles.

Jelly is troublesome, and jelly-forming constituents are much to be avoided. What is wanted, then, are unctuousness to the maximum, body regulated to suit the conditions, and a constant mobility unaffected by temperature. Solid lubricants should only differ in body; they should not lack in unctuousness, nor should they change mobility under temperature changes. What we do not want are acidity and residue. Pure mineral lubricants seem to be the right products in automobile work, and, fortunately, there are producers, of honesty and skill, catering to the automobile trade, who have made a study of the automobile, and who fully realize the desires and the reasons.



Customary Pressure System.

It is to be hoped that lubricants will not be rendered acid by the addition of substances of an acid reaction, in order to impart a sweet-scented odor. Autoists do not use lubricants as pomade. It is equally objectionable to reduce the degree of unctuousness by any clarifying process whatsoever. A good lubricant with a bad color is superior to any of the "æsthetic blends," in which the value of the qualities for lubrication may be a diminished quantity. The automobiles of to-day are less noisy and lower in cost of maintenance because grease cups are used in great profusion where once a hole was drilled and dirt was free to enter, there to mix with an occasional drop of oil, to make abrasions that soon increased the lost motion and the rattle.

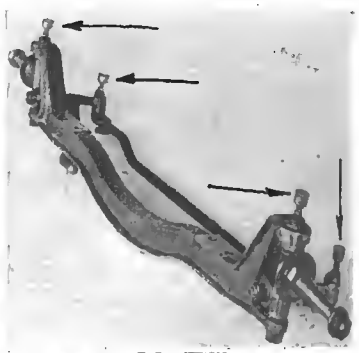


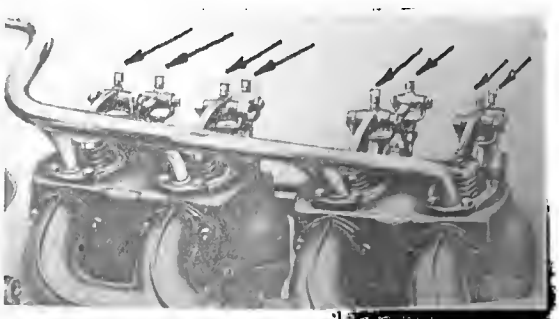
Section of a Conventional Force Feed System.

Oil Piping and Fittings.—The need for a sturdy system of piping has been felt keenly in the past, and, fortunately, the builders of automobiles are alive to this fact. Piping is now more stable, and, besides the better grades of annealed copper tubing, there seems to be a demand for "flexible metallic hose." This product is easy to install, remains tight, and is free from breakages in service. Valves and fittings are with ground joints and are stable in maintenance. Graphite, in its several aspects, is widely used in connection with both the hard and liquid lubricants. With graphite care must be exercised with the piping to prevent clogging.

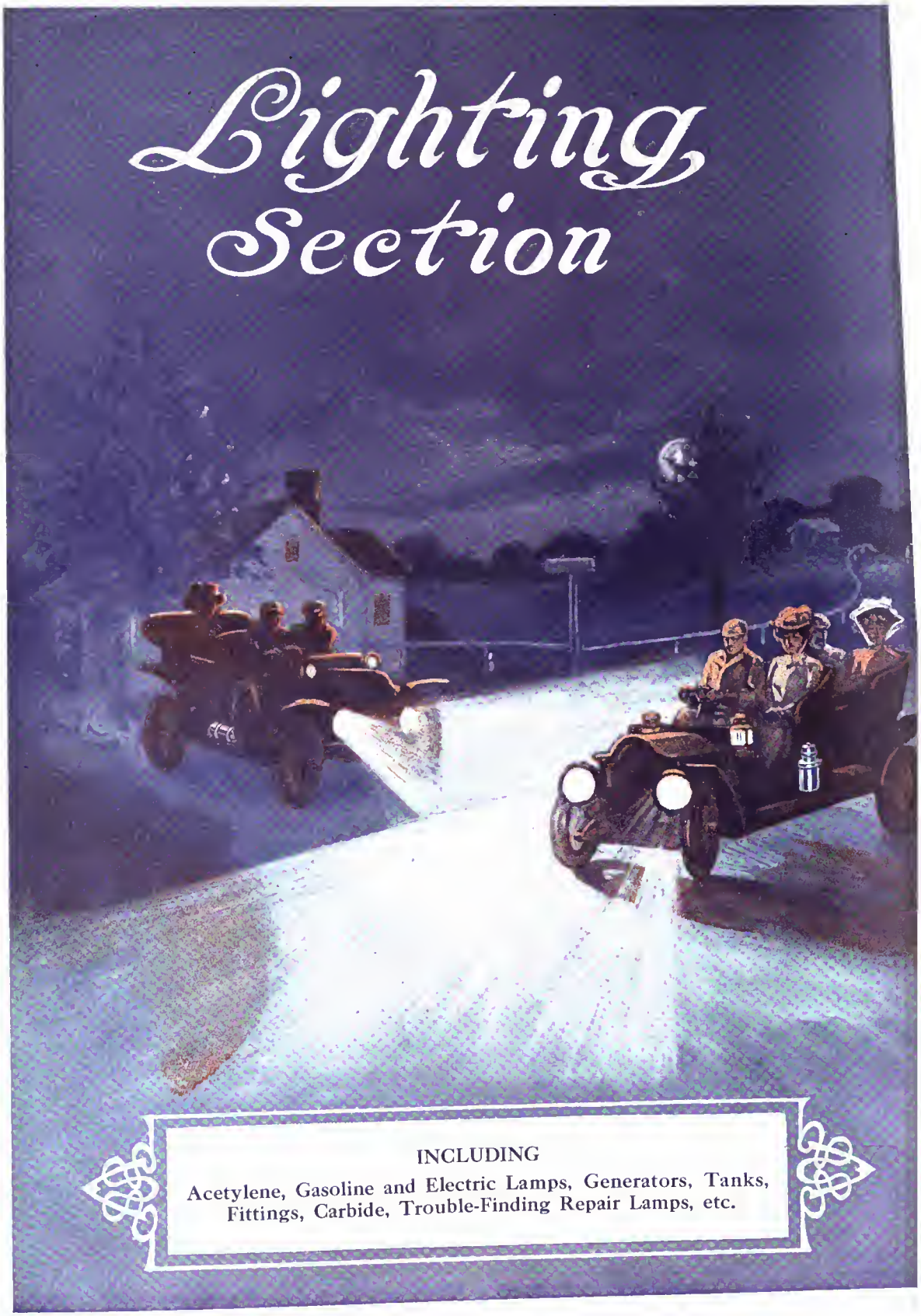
Influence of Good Oil on Maintenance of Cars.—It is not certain that this phase of the subject was so very well understood by even the builders of cars until very recently. At all events, taking the evidence available, it would not be far from wrong to say that there was not a sufficient display of oiling devices on cars until it was adequately proven that the life in service is dependent upon the care with which the oiling is done. This does not mean that a crankcase full of oil will do all there is to be done. A body of good oil laying in the crankcase will scarcely serve to oil the multiplicity of small parts that will soon cry for lubrication in a most distressing way, and if it be denied the car will reach the "noise" stage long before it is ready to "scrap," unless it is true that noise alone is sufficient cause for not wanting a car. A little grease cup on the dozen-and-one small bearings that cannot be oiled in any other way will do a world of good, and the builders of cars now recognize this fact. Users of these same cars will do well to note the fact, and they will be wise if they regard the grease cups in the light of utility devices of a high degree.

It would not be too much to say that a grease cup on a shaft or a spring, as the case may be, will do more to prevent rattle and defeat depreciation than all the polishing of bright work and varnish that can be done during the life of a car. But if it is important to keep the cups full of good grease, it is doubly so to supply a continuous film of the finest lubricant to the rotating bearings. A feast and a famine will do about as much good as no oil. True, there may be a chance of putting off the evil day, but not for long. The one sure way to avoid any trouble at all is to see to it that the oil is not only good, but that it reaches the spot. The builders of cars of the kind that an autoist of experience will be likely to choose have done their part when they provided the devices and protection from "grit." It must be understood that protection from "grit" of the road depends upon profuse oiling, as well as upon such mechanical protection as ingenuity will evolve. The underlying principle is one in which oil going out assures that grit is not passing in. Chains, for illustration, if kept well lubricated, even if they are in actual contact with the dust of the road, will take care of themselves to a marvelous extent, contrary to a popular superstition. This, too, is for the reason that the oil on the surfaces will not allow the grit to get to them. As long as the grit is warded off the situation is healthy. A run of a century on a dry chain is likely to do more damage than ten such runs on a chain provided with enough oil to coat the surfaces. What is true of a chain is equally true of all the other parts of a car, and it is not assured that autoists fully understand this important matter. If they do, it is also important to look out for impure lubricants, such as animal grease in which acid abounds, or the compounds that will become rancid in time, which is not uncommon.


Characteristic Use of Grease Cups.


Illustrating the Applicati[illegible]

Lighting Section



INCLUDING

Acetylene, Gasoline and Electric Lamps, Generators, Tanks, Fittings, Carbide, Trouble-Finding Repair Lamps, etc.

The Necessity of Adequate Lighting

THIS is a matter in relation to which it will be fair to say the equipment can scarcely be too good. In the early days lighting facilities were rather crude and the memory of the average autoist is a little raw when lighting is the subject. Fortunately the experience gained has been put to good account and the lighting equipment now to be had is up to a high standard.

Legal Requirements.—The oil sidelights and a tail-lamp must be used to conform to the law. These lamps are usually of such good value that they serve for lighting "about town" without having to utilize the gas system. The trend in oil lamps is toward more thorough work and greater security as against the loss of parts on the road. The brackets of die forged steel are more substantial than were the castings (bronze) of the past.

Great Variety in Gas Lamps.—The gas lamps to be had are in great variety and efficient in the extreme. The lenses are in sizes up to 12 inches, designed in divers ways to suit conditions. If a concentrated "beam" of light is wanted lamps are made to project the same, or, if a scattered illuminating effect is to be included, then, too, are lamps to be had. The efficiency, as measured in candlepower for a given acetylene consumption, is remarkably high.

Source of Gas Supply.—The gas supply is available in two ways, viz.: (a) from tanks of acetylene under some pressure; (b) from generators in which the calcium carbide is used direct. The acetylene tanks are of convenient size and the principle of the storage of the gas may be briefly stated as follows: Asbestos wool is put into the tanks and a measured quantity of acetone is added. The acetylene gas is thereafter communicated with the tanks and the quantity of acetylene that each tank will hold is very considerably increased because of the presence of the acetone, which has an affinity for acetylene. These tanks are made in various sizes and are in strong demand.

Considering the direct generators, they are in divers form and in sizes for every possible requirement. These generators are generally made in brass, avoiding seams as much as possible, and in some cases a water jacket is provided around the carbide chamber with a view to equalizing the temperature, it being the case that dissolving carbide generates heat. A constant temperature is desirable in any case, and the best way to accomplish this end is to provide a water jacket and afford a means of regulation such as will assure the generation of gas exactly in accord with the needs. In cold weather the water is likely to freeze, and this is a disadvantage to consider.

Means of Regulating Pressure.—Since gas burns under conditions involving pressure on a basis of from two to four inches water equivalent, means must be provided in connection with the acetylene tanks to maintain the constant desired pressure. The tanks are so arranged as to afford this constant pressure throughout the entire range from a full tank down to the last pound. In connection with the direct generation of gas from calcium carbide, regulation is afforded by limiting the supply of water that drips into the carbide. This water supply is automatically cared for by the pressure and means are at hand for shaking the ashes out of the carbide.

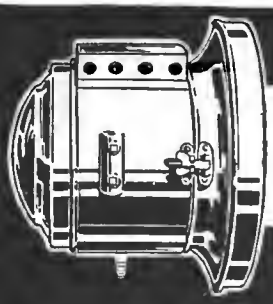
Some General Features.—It is customary, and a good idea, to place the gas tank or the generator, as the case may be, in a very accessible position not influenced by temperature changes. The running board seems to be the logical location, and the security traps or brackets, as the case may be, are generally arranged for quick undoing. While the finish is in brass, as a rule, there are oxidized effects that are well worth considering, since they present less striking appearance and greater permanence. Bright work looks extremely well if there is not too much of it and if it is maintained bright. These conditions do not always obtain.

Incidentals of the Lighting System.—The piping from the generator to the lamps is generally a small annealed copper tube with rubber hose flexible terminals. This piping serves very well if it is not too small, although it is true that a certain surface accumulation is of an explosive nature, which accumulation is the result of chemical action between the acetylene and copper. This detail does not seem to be a matter of any great moment, because the little explosions oftentimes go unnoticed and never are of any great force. Besides copper tubing in the ordinary form, there is a line of flexible metallic hose in both copper and steel that serves very well indeed, although it is considerably higher priced.

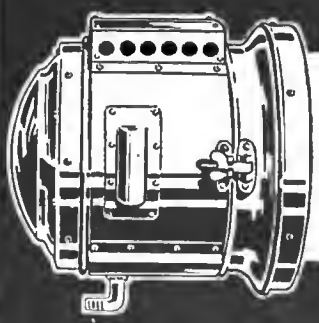
Installation of the Lighting Systems.—If autoists have any complaint to make in connection with lighting systems it is to point out the absence of care in running the piping. Suitable fastenings are not always provided, and piping adrift is likely to cause a rattle, even if it is not damaged at points of contact. These complaints are not general, and in the better class of cars of the present time the piping work is nicely done. As a matter of fact, the tone of the work throughout lighting systems has been considerably enhanced all along the line.

The use of electric lights on the electric types of vehicles was always an attractive feature, and it has always been the desire of autoists to get away from the ills of inferior means. In recent times this question has been agitated at considerable length, and the storage battery has been so thoroughly improved as to lend itself perfectly to the purpose, thus taking care of the lighting as well as of ignition work. The batteries are small, compact and durable. They give a suitable length of service on a single charge, and the facilities for charging are now thoroughly good in every way. The systems are worked out to a nicety, and the cost is well within the means of even autoists who do not complain of a fat purse. In the early days, the batteries were not so good, and, unfortunately, the means were wretched, if not outright bad. The men who were at hand to take charge of the process knew nothing about batteries or electrochemistry, and the batteries being delicate, suffered in consequence.

In some of the systems means are provided for charging the batteries without removing them from the cars, and in the hands of autoists of the least bit of skill they are well worth while. True, many autoists prefer not to do any of the work involved in the upkeep of their cars, and with them it is more to the point to have the work done in a garage fitted out for the purpose. There are just such places everywhere throughout the land, and the scheme has the advantage of assuring one that the batteries will be handled by men skilled in the art. To what extent electric lights will be used remains to be seen.



WHICH GIVES THE LIGHT—



THE LENS MIRROR OR THE FRONT DOOR?

The lens mirror, of course! An extravagant front door is only of value to make a small lamp look big until it is sold. When the purchaser lights the lamps after dark he forgets all about their front doors.

There is not, and there never was, one bit of sham about Rushmore Searchlights and Headlights. They are built for service first, last and all the time; and their outward appearance is simply the artistic expression of their inward excellence. When a man has once used Rushmores of proper size, and has learned what genuine after-dark lighting efficiency is, he is never afterward content to be virtually restricted to daylight use of his car.

1909 RUSHMORE PRICES

are so low that to accept substitutes is simply a waste of good money. An output three times as great as a year ago, combined with modern factory economies everywhere, enables us to-day to sell the best lamps in the world at prices actually lower than those of the nearest imitations.

PRICES

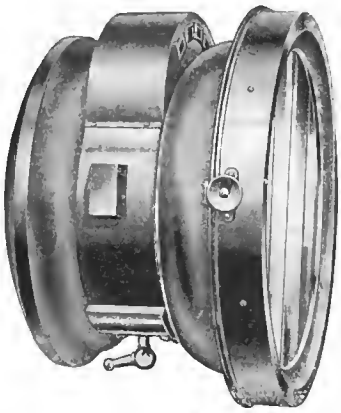
Plain Door Style Rigid Headlights	*Plain Door Style Swing Searchlights*	*Flare Front Style Rigid Headlights*	*Flare Front Swing Searchlights*
6 in. size.....$7.50	6 in $12.50	Size A.....$ 8.50	Size A.....$13.50
7 " " 10.50	7 " 16.50	" B..... 11.50	" B..... 17.50
8 " " 14.00	8 " 19.50	" C..... 15.00	" C..... 20.50
9 " " 21.50	9 " 28.00	" D..... 23.00	" D..... 29.50
10 " " 28.50	10 " 37.00	" E..... 30.00	" E..... 38.50

Size A lights have same lens mirrors as the 6 in. size. Size B same lens mirrors as 7 in size, etc.
No. 1 Square Automatic Shaking Grate Generator, $12.00. No. 2 (capacity 5 lbs.), $17.50

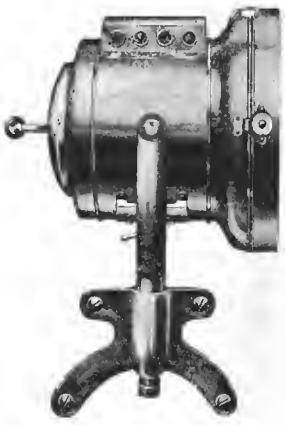
RUSHMORE DYNAMO WORKS

PLAINFIELD, N.J.— CHICAGO, ILL.— LONDON.— PARIS.

GRAY & DAVIS

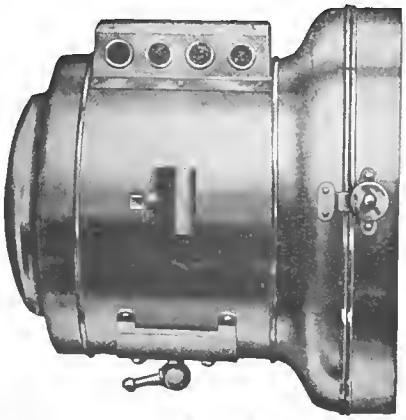


Style Nos	96	97	98
Price, each	$11.50	$15.00	$25.00
Diameter Flenge	9¾	10¾	11¾
Extreme Length	8½	9½	10½
Extreme Height	9¾	10¾	11¾
Distance between cen. preps.	7½	8¾	9 1/16



Style Nos	868	870	872
Price, each	$13.00	$16.50	$20.00

1909 STYLES AND PRICES



Style Nos	867	869	871	873
Price, each	$8.00	$11.50	$15.00	$20.00
Diameter Flenge	9¾	9¾	9¾	10¾
Extreme Length	8	9	9	11
Extreme Height	9	9	9¾	10¾
Dis. between cen. props.	7½	8¾	9 1/16	10

Type G Generator

Price, each $13.50

NEW YORK CITY
377 West Broadway

Main Office and Factory
AMESBURY, MASS.

BOSTON, MASS.
749 Boylston Street

GRAY & DAVIS

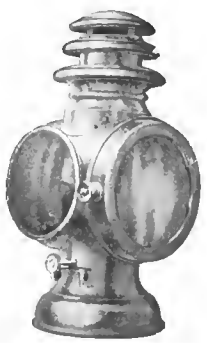
Style No. 838
Price, each.....$9.00
Size Body.....5½x5½
Extreme Height.....14½ Ins

Style No. 835
Price, each.....$9.00
Size Body.....5½x5½
Extreme Height.....14½ Ins.

Style No. 936
Price, each.....$6.50
Size Body.....5½x5½
Extreme Height.....14½ Ins.

1909 STYLES AND PRICES

Style No. 934
Price, each.....$5.50
Size Body.....4½x4½
Extreme Height.....13 Ins



Style No. 917
Price, each.....$5.00
Diameter Flange.....5 Ins.
Diameter Ruby Jewel..3½ Ins
Extreme Length.....5½ Ins
Extreme Height.....11½ Ins

Style No.15
Price, each.....$3.50
Diameter Flange.....4½ Ins.
Diameter Ruby Jewel...3 Ins.
Extreme Length.....5 Ins.
Extreme Height.....9½ Ins

NEW YORK CITY
377 West Broadway

Main Office and Factory
AMESBURY, MASS.

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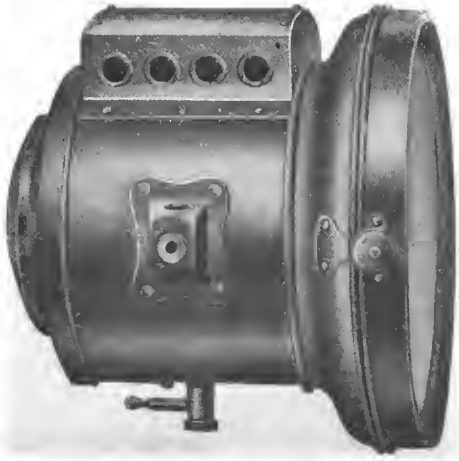
'09 Corcoran Lamps

You Don't Have to Experiment with Auto Lamps and it isn't necessary to Spend a Powerful Lot of Money to Get the Best.

CORCORAN LAMPS

have been made by one concern for nearly a hundred years and think you that in this time that anything good in the lamp way has ever gotten past "CORCORAN." Before you were born, very likely, "CORCORAN" Lamps were good lamps and down to the succeeding years they have been good lamps and for years to come they'll be good lamps. Besides being good lamps (none better are made, anywhere by anyone), they are lamps that cost you but little. Years of fine lamp building has pointed economical methods of manufacture; the economy so acquired, the saving we make we divide with you, so you get as good lamps—better than most—at a very low cost. Is there any reason why you should set up a search for Auto Lamps when you don't have to, when you can come to us and be assured of complete and lasting satisfaction?



In any event it won't hurt and it won't cost anything to find out and we feel sure that you will be well pleased with the results of any investigation you set on foot.

CORCORAN LAMP COMPANY

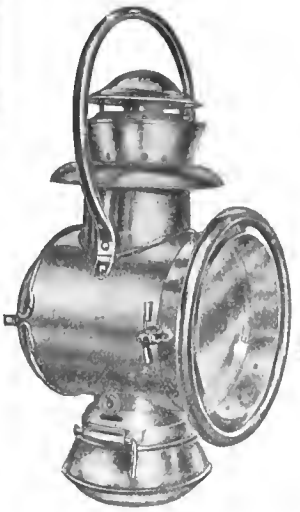
Cincinnati, Ohio.

There is a clever profit in CORCORAN LAMPS, as the dealer who handles them will quickly realize. Dealers:—Ask for the CORCORAN profitable proposition.

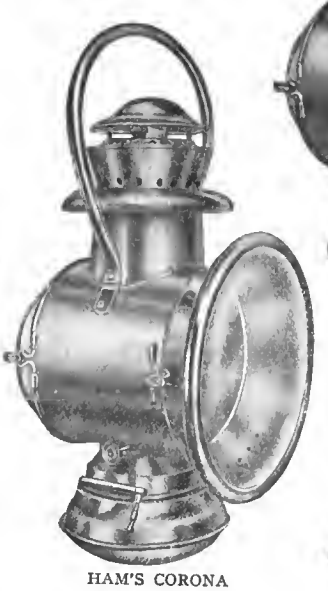
HAM'S "COLD BLAST" AUTOMOBILE LAMPS

Beautiful in appearance. Made very strong of the highest grade, heavy gauge brass and producing a brilliant light. Guaranteed not to blow or jar out. Ham's are without a doubt the finest burning automobile lamps on the market.

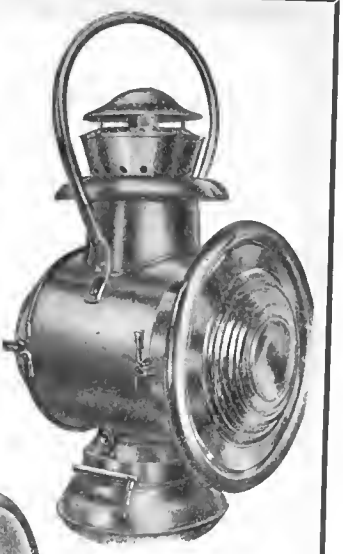
HAM'S LIMOUSINE



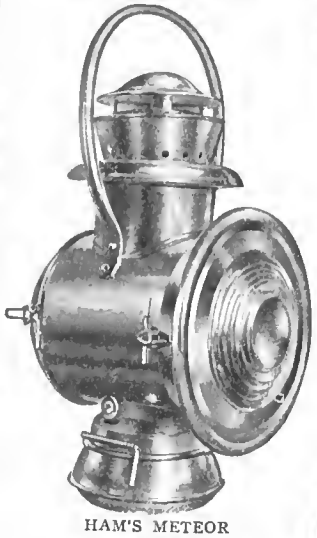
HAM'S STAR



HAM'S CORONA

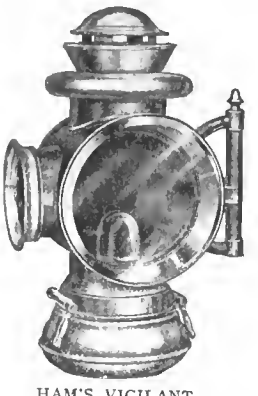


HAM'S TOURIST



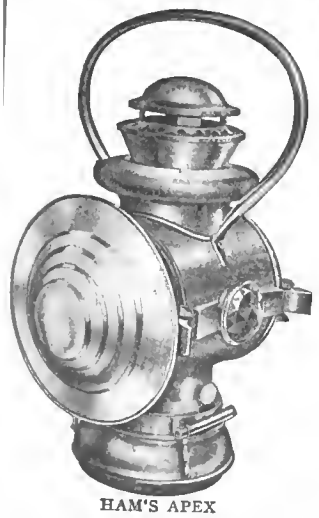
HAM'S METEOR

HAM'S MARS
Tail Lamp

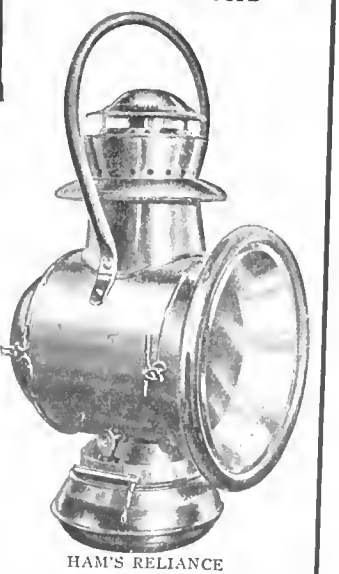


HAM'S VIGILANT
Tail and Inspector Lamp

HAM'S COUPE



HAM'S APEX



HAM'S RELIANCE

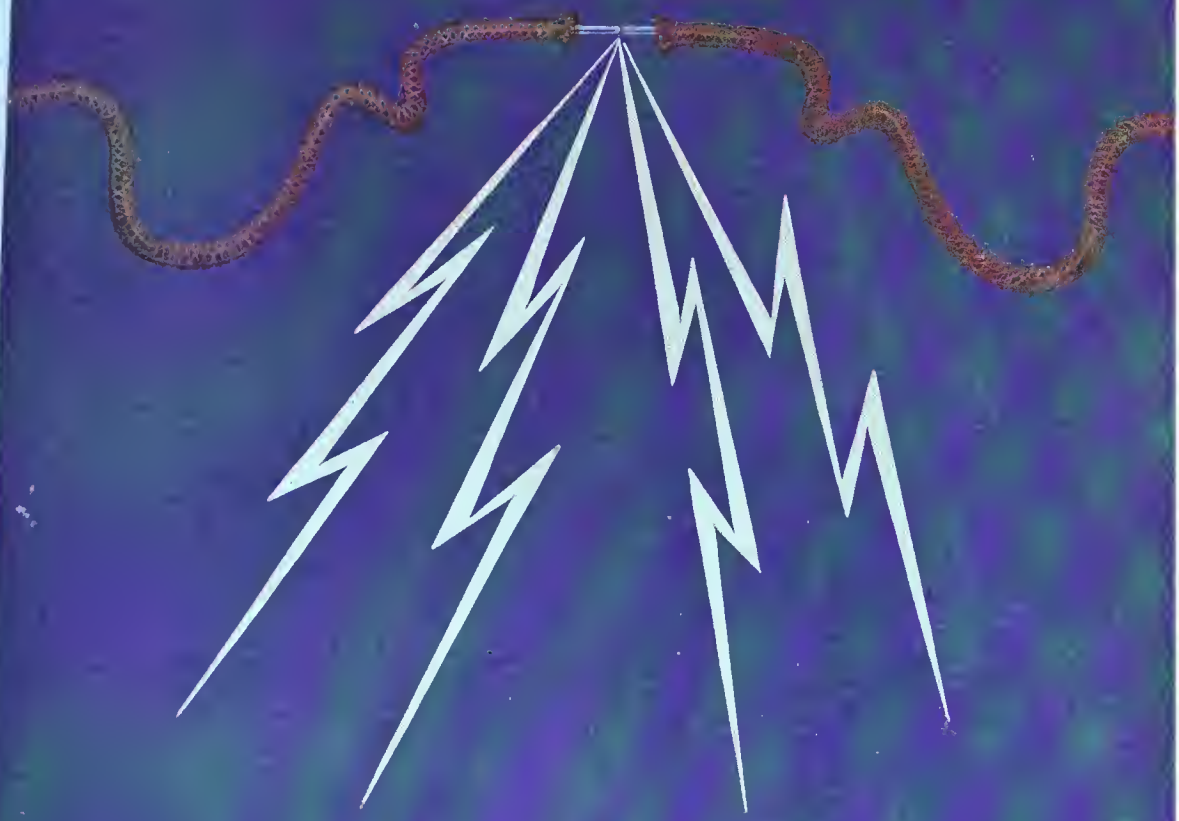
See our exhibit at Grand Central Palace Show. "Space 166, Section U." Opening in New York City on New Year's Eve.

Also write for one of our Handsome New 1909 Catalogues, just out. Address "Dept. B."

C. T. Ham Mfg. Co.

ROCHESTER, N. Y.

Ignition Section



INCLUDING

Magnetos, Spark Coils, Timers, Spark Plugs,
Batteries, Electrical Fittings, etc..

This is the Magneto that Stands the Most Abuse—See it at the New York and Chicago Automobile Shows

The Remy High Tension Magneto is designed especially for American Automobiles. The broadest margins for abuse—both electrical and mechanical—are afforded on the Remy. It is "fool proof."

Positive firing is assured by the Remy under conditions of oil, dirt and water that puts its competitors out of commission.

It will fire the motor properly running at a lower speed than any other Magneto in the world. This is a big point in cities where cars must be run at low motor speed as often as high motor speed.

Anybody can install a Remy whether he is a skilled mechanician or not.

This is the Magneto without brushes. No brushes to wear out, give trouble or be replaced.

The Remy

1909 High Tension Magneto

Double ignition with one set of spark plugs is another Remy feature originated by us.

Starting may be done from the seat of the car without cranking—with the greatest certainty of any system starting from the spark.

We have sold on minimum Specified deliveries over 17,000 Magnetos for 1909 cars. More of these Magnetos are already sold than all other makes combined.

With automobile manufacturers continually striving to build better cars than their competitors, there is a reason for their adopting the Remy Magneto.

It is designed by engineers who have been connected with automobile work since its beginning and embodies ideas suggested or approved by the largest manufacturers.

Our factory was built especially for Magneto manufacturing and is the largest of its kind in the world.

In the hill climb endurance run—speed contest—in all kinds of tryouts everywhere, the Remy has more victories to its credit than all other makes combined. The Buick, equipped with the Remy Magneto, led all American cars at Savannah.

This is a sample of the letters we receive daily:

Boston, Mass., Sept 30, 1908.
"Remy Electric Company.

We have recently entered several racing events and our cars, equipped with your ignition apparatus, have all made wonderfully good records.

At Montreal, our Model 5 had captured eight out of nine events beating Christy and Barney Oldfield's machine and tieing for the fastest half mile track in 1:12 This car was equipped with your Magneto and as the report shows, ran faultlessly throughout the several events.

Buick Motor Company,
Boston Branch,
H. K. Hoyes, New England Mgr."

Write us for illustration and full description of our new high tension Magneto. We are building them in such large quantities that we can make you very attractive prices. We furnish fittings for attaching these Magnetos to many of the old models of the different American cars.

Write us today. Address Dept. 12.

Remy Electric Co., Anderson, Ind.

We have opened a branch house at Thoroughfare Building, Broadway and 57th St., New York

Our Show Exhibits are Located:

Grand Central Palace	Madison Square Garden	Chicago Coliseum
Gallery, Space No. 126	Space No. 125, Elevated Platform	Gallery, Space No. 65

Regular Equipment on these Cars

Regal Motor Car Co.
Maxwell-Briscoe Motor Co.
Apperson Bros. Automobile Co.
Model Automobile Co.
Overland Automobile Co.
Kissel Motor Car Co.
Crawford Automobile Co.
Midland Motor Co.
Cameron Car Co.
Olds Motor Works.
Buick Motor Co.
Pope Motor Car Co.
Buckeye Automobile Co.

Extreme Importance of Reliable Ignition Systems

IF there is any one point in relation to automobile motors that influences for good or ill, according as the system is noteworthy or not, it is the ignition. If the carbureter does not work very well, it is the ignition system that will disguise the fact if the same is of a high order of merit and in good working order. With a good ignition the mixture will scarcely have to be up to a point of high inflammability, whereas if the ignition is not efficient even good mixtures will ignite with difficulty. Under the circumstances it would be by far better to do without some luxury with the idea of purchasing the best possible ignition devices, which, however, would be to no purpose were they but poorly installed.

That a "dual" system of ignition is well worth having is not to be denied, which is not to say that some parts of the system may not be in common. The practice of using a single timer, for illustration, the same to serve for both the magneto and the coil, is not one to be condemned. On the other hand, there is no objection to separating the systems in such a way as to possess two complete and independent ignition systems. Some of the modern low-priced cars are provided with a magneto in conjunction with a "transformer," battery and timer in common. Certainly this is better than the earlier practice, in which a coil and dry battery constituted the whole ignition proposition.

The superior grades of magnetos are rather costly, and it goes without saying that the very low-priced cars can scarcely stand the expense, especially if a dual system is provided. In making a choice it is not far from right in such cases to select a magneto, and some means for starting. At all events, the whole situation is much improved over what it was in the past with divers choices for autoists of discernment.

Magnetos Moved Up to First Place.—That the magneto is now regarded as of the first importance can be taken for granted, which point is adequately illustrated in numerous of the automobiles to be seen at every hand. In one case the magneto is built into the flywheel, thus becoming a part of the motor as it were. In many of the important products the magneto is regarded as finality, if a dual system is used, and in some cars the magneto is considered adequate for the purpose, irrespective of the fact that a dual system of ignition may be provided. In other words, the time has passed when it will be proper to consider the magneto in the light of an auxiliary to the coil system. It is the coil system that has reverted to second place in the onward march of ignition systems.

If magnetos have advances in utility, it is equally true that the coil systems have made strides also. In the old days coils were not quite up to a fitting standard, primarily because the bundle of wire in the magnetic circuit was not of a high magnetic permeability. The lag of the spark was not at a constant rate, and the same lag was overmuch. The result was that the regulation of the spark was beyond the ability of the operator of the car, unless at the lower speeds of the motor. Maximum power of the motor could not be expected under such conditions, nor was it realized within a considerable margin.

The "high tension jump-spark," as compared with the "low tension wipe-spark," it is futile to take space to discuss relatively. The users of both swear by them, and each user backs up his statements with evidence such as cannot be refuted. The probabilities are, both systems being so thoroughly good as to serve well the purpose, it is purely "hair splitting" to discuss the relative merits with a view to finding a difference.

Magnetos have other differences mostly as respects the details of the magnetic circuit, and in placing of the secondary windings as well as the condenser. When reference is had to the quality of the materials in the permanent magnets, there may be differences, since the materials do not all come from the same hole in the ground. As respects the utility of the respective qualities of materials used in the permanent magnets, it is quite another matter to differentiate. It would take a long series of tests to establish the facts, and the cost of the investigation would be out of all proportion to the benefits likely to be derived. In other words, all the materials used are so thoroughly good as to serve well the purpose, and from the point of view of the users of cars it would be a task to try to discriminate. The makers of cars can be relied upon to keep an eye on this phase of the question, since it is to their advantage to see to it that the magnetos they use are provided with permanent magnetos of a stable character. On the whole, the magneto situation is on a very thoroughgoing basis, leaving little to be desired.

Situation in Relation to Coils.—The slight reference made to coils was indicative of improvements in the magnetic circuit windings and insulation, and if coils are better in these ways, it is true of them also that they are improved in all ways. Take, for illustration, the "unit trembler," in which any number of coils are under the control of one trembler only. Certainly it is far less trouble to adjust one trembler for several cylinders than it is to try to adjust one trembler for each cylinder. Then, again, there is the scheme in which one coil is used in common for all the cylinders, taking into account a high tension jump-spark distributor, which coil can be with or without a trembler.

In this class of work, if no trembler is used, the timer is so adjusted as to afford a very short period of contact, thus delivering but one spark at a time; and delivering the same at the propitious moment. One good spark at the right time is what is wanted in any case, and any system that will deliver the one "high energy" spark will serve well the intended purpose.

This is not to say that there is any disadvantage in delivering a series of sparks, as in the coil with a trembler, for there can be none. Indeed, if assurance could be had of delivering a series of sparks so timed as to ignite the "mixture"—(a) at the propitious instant; (b) as many times as possible thereafter—the rate of flame propogation would be greater, and, within limits. it would be an advantage. If no guarantee can be had of de-

livering a series of sparks on the basis as above outlined, the next best thing is one spark at the right time. Fortunately, the several systems are so thoroughly perfected as to perform their functions to a degree of perfection leaving little to be desired.

There are still to be had the class of coils in which a trembler is used for each coil. Some autoists claim that the compression differs in the respective cylinders enough to demand recognition. In other words, they claim that by adjusting the separate tremblers for the respective coils and cylinders, they realize more uniform results; and they probably do. The only point is, it takes a little more skill than can be expected from a novice, and, besides, it would be possible to adjust compression as well as the spark in a case of this sort. These same autoists set up the contention that absolutely independent ignition systems for each cylinder would be an advantage in case of a break down of any coil. There is a good deal in this, since coils are extremely difficult to repair. On the other hand, it is a fact that of all the equipment in cars, coils seem to hold out the best; indeed, it rarely ever happens that the coils fail in actual service. When they do, it is because of positive abuses and much exposure to the elements under sharp variations in temperature.

Advantages of Various Types of Batteries.—The storage battery ranks first because of its higher voltage on open circuit, its lower internal resistance, and its consequent higher "watt" efficiency. Of the storage battery it is also possible to say the actual available energy is considerably higher at a higher rate of discharge. If these are characteristics of storage batteries, it is also true of them that they are "wet" and the "spillage" is diluted sulphuric acid. True, the batteries are very effectually sealed, and the spillage does not amount to anything at all in the cases in which the batteries are accorded a fair measure of attention. If storage batteries are charged at regular intervals, and the electrolyte is maintained at its right strength, they serve well their intended purpose, and well repay the autoist.

Dry batteries are used extensively and in the larger sizes, excepting when they are used as seconds, in which service it is not expected of them to do more than answer to an emergency call. There is no denying the fact that if dry cells are used, it pays to employ the larger sizes. They last far longer and during their life they afford a better result, since the internal resistance is lower and the amount of depolarizer is in far greater excess. In the earlier times the battery connectors were something of a nuisance, but this is of the past owing to the improvements wrought in this direction. It is now possible to purchase batteries of the "dry" variety in boxes of great utility, so arranged that the connections are made automatically.

As between the two types of battery, choice depends upon the point of view. If one cannot have the storage battery charged at regular intervals, it is a waste of money to buy it, in which event the dry battery has many points of superiority. If the coil is economical, the dry battery serves very well in any case. If the battery is for emergency work only, the dry battery will do.

Besides storage and dry batteries, there are primary batteries that should have a place in this class of work. They are good current givers, and the replacement of the "charge" is attended with little or no difficulty. These batteries are of the "wet" description, and on that account may not be preferred by some. To seal them should not be a great task; sealing is effectual in the storage battery work. The difference between a primary and a storage (secondary) battery lies in the fact that with the primary battery the elements are wasted away, and have to be replaced when they give out. In a secondary (storage) battery, the elements do not give out during the natural life, and to recuperate the battery it is but necessary to recharge the same.

Battery boxes are to be had in wood, highly finished, and in pressed steel; under lock and key, if desired. They are made in a variety of sizes to fit on the running-board or under the seats. Batteries are made in certain sizes, and the makers of boxes have taken this fact into account. This automatic cooperation has resulted in the lowest possible first cost, quick deliveries, and the highest possible quality of the respective products.

Something About Chemicals Used in Batteries.—Storage batteries are provided with a solution of sulphuric acid in distilled water. The strength of the same is 25 degrees Baumé. The water must be distilled in a tin-lined equipment and must be free from iron, chlorine, nitrates, mercury, copper, arsenic, and such other ingredients as might introduce undesirable chemical action. A storage battery will last for a long time if it is not allowed to become contaminated by some one of the elements or compounds such as will induce chemical action. There is nothing that will so quickly reduce a battery to a useless state as iron, chlorine, or nitrates. Any of these ingredients can come from the water or from the surroundings. Electrolyte can be purchased from the chemists, guaranteed pure and of the right strength.

Dry batteries do not have to be replenished unless they are allowed to dry out, in which event it is possible to recuperate them by spilling water into them, in which water a little sal ammoniac will serve a useful purpose. Primary batteries may require caustic soda or what not, depending upon how they are made. In any event, it is desirable to use pure chemicals from a reliable source.

Electrical Conductors, Terminals and Fastenings.—However a good coil or a magneto may be it is of no practical avail if the insulation on the secondary winding is below the requirements. It is not far from right to claim that the electromotive force in the secondary circuit of a modern "transformer" will reach the enormous instantaneous value of even 40,000 volts. The wave is an irregular saw-tooth, and the electrostatic strain is so very great as to require an extra thickness of the finest insulation to sustain under such conditions. It is a simple waste of time to use anything but the superior grades of insulated wire in secondary circuits, and the manner in which the terminals are made up is a matter of some moment. Fortunately, suitable grades of insulated wire are to be had and builders of automobiles are alive to the needs of the service. In repair work, or in going over a car, it is not unusual to see repairmen make splices in the wiring. The secondary wires should not be spliced, because it is not easy, if possible, to maintain the high insulation resistance of the wire that should and does obtain when the insulation is new and not spliced.

The primary wiring does not have to transmit high electrical pressures, but the joints have to be good because the voltage is low. With a low voltage, if a joint is not good, the resistance becomes so great as to defeat the aim. Terminal connectors should be used, and in every possible case the joints should be soldered. There are divers forms of terminal connectors to be had; they all answer the purpose to a greater or less degree, and none of them is so inferior as to warrant going back to the simple expedient of twisting the bare wire around the terminal screw.

Of Spark Plugs There Are a Plenty.—The spark plug situation is in good shape, with a considerable selection at the disposal of the autoist. The underlying idea is the same in most of them, but there are considerable differences in point of detail. Of insulators, there are the porcelain tubes on the one hand, and mica on the other. Porcelain is so much improved in modern spark plugs as to give almost no trouble at all, while mica, if it is well selected and nicely put together, will last for a very ong time. The details of finish of spark plugs are much more refined than they were in the past, and the question of the standardization of the thread in the cylinders is receiving a due measure of attention. Ofttimes the trouble experienced with spark plugs is due to ill-fitting threads that allow the plugs to screw in more than they should, or a leak is developed around the plug. In some cases in the past, the plugs were not located in the most efficient zone, in view of the uncertain nature of the mixture in the cylinders. If motors are with a high compression, the question of the location of the plug is not a matter of so much moment provided the sparking equipment is suitable for the purpose in view of a high compression, it being the case that the higher the compression the greater the resistance.

K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W

If you want the best, simplest and most reliable Ignition System, install a

K-W Magneto and K-W Coil

and Forget You Have Any Ignition

YOU CAN PAY MORE BUT YOU CAN'T BUY BETTER

The New Model "G" K-W Magneto, $50.00

GEAR DRIVEN AT ENGINE SPEED
and works with a vibrating
coil and timer.

GUARANTEED TO START WITHOUT BATTERIES.

The model "G" K-W Magneto was designed with the sole purpose of replacing the complicated High Priced High Tension Magnetos of other makes that go wrong. It has standard base and will fit in place of Magneto you take off, or in place provided for Magneto on your motor.

READ THIS:

Minneapolis, Minn., Dec. 1, 1908.

Gentlemen—Wish to say that I have a K-W Magneto installed on my Pierce-Arrow car and there are no words too good to use in connection with this outfit. It is giving perfect satisfaction, and in fact giving much better results than it was possible to obtain from a high priced Magneto which has been installed and taken off from the car in question. Enough said.

Yours very truly, (*Signed*) S. S. JOHNSON.

We can show thousands like this. It's what they all say.

The K-W Magneto is simple and efficient because it is designed right; reliable and durable because it is built right; cheap because it is simple. No complicated traps and triggers to go wrong—no moving wires or brushes or contacts. Runs in Ball Bearings and is built to last, and does last.

The New K-W Coil

Do you know that the average quad coil contains a tablespoonful of water after winding. We take all this out by the advanced K-W system of coil building, giving an anhydrous coil and a coil with a quick time constant—a coil you cannot break down.

The K-W coil is the best that can be made at any price and the price is extremely low for such a high-grade coil. No unfair discounts but true value:—

Plain box coils (Marine coils or unit coils)	$6.00
Single cylinder mahogany dash coil with switch	12.00
Double " " " " "	18.00
Three " " " " "	24.00
Four " " " " "	30.00
Six " " " " "	42.00
For synchronized coils, add to above	10.00
For Synchronizer or Master Vibrator alone in mahogany dash box and switch	15.00

The K-W synchronized coil is like the regular K-W coil, and has an extra unit which contains the Synchronizer or Master Vibrator, and has a shunting device on the individual vibrators so you can use either the Master Vibrator or the individual vibrators at your will, thus giving two systems in one—either of which is better than you are now using. Its advantages are too numerous to mention here. Write to-day.

We make Magnetos for both make-and-break, and jump spark ignition in belt, friction and gear drive, and are constantly adding to our line. Get our catalogue now.

We want live dealers to handle our line in every city. If you can't see us at the show, write us.

WATCH FOR THE NEW K-W HIGH TENSION MAGNETO WHICH WILL BE EXHIBITED FOR THE FIRST TIME AT THE SHOWS. IF YOU WANT TO SEE THE MOST ADVANCED TYPE OF HIGH TENSION MAGNETO—THE BEST ONE YET—SIMPLE, DURABLE, RELIABLE, LOOK US UP.

SPACE 223 MADISON SQUARE GARDEN, NEW YORK CITY, JAN. 16th to 23d.
SPACE 387 BOSTON SHOW, MARCH 6th to 13th.
SPACE 38 NATIONAL MOTOR BOAT SHOW, NEW YORK CITY, FEB. 15th to 23d.

THE K-W IGNITION CO., 34 Power Ave., Cleveland, Ohio, U.S.A.

New York Representative.....A. H. Green & Co., 1666 Broadway, New York City.
Boston " .....W. J. Forbes, 220 Congress Street.
Chicago " .....The Automobile Supply Co., 1339 Michigan Bldg.

Canadian Representative:
The Canadian General Electric Co.
Toronto

K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W K-W

IGNITION RELIABILITY

is, in the last analysis, simply the ability to ***keep going,*** coupled with ease of repair and adjustment when wear occurs.

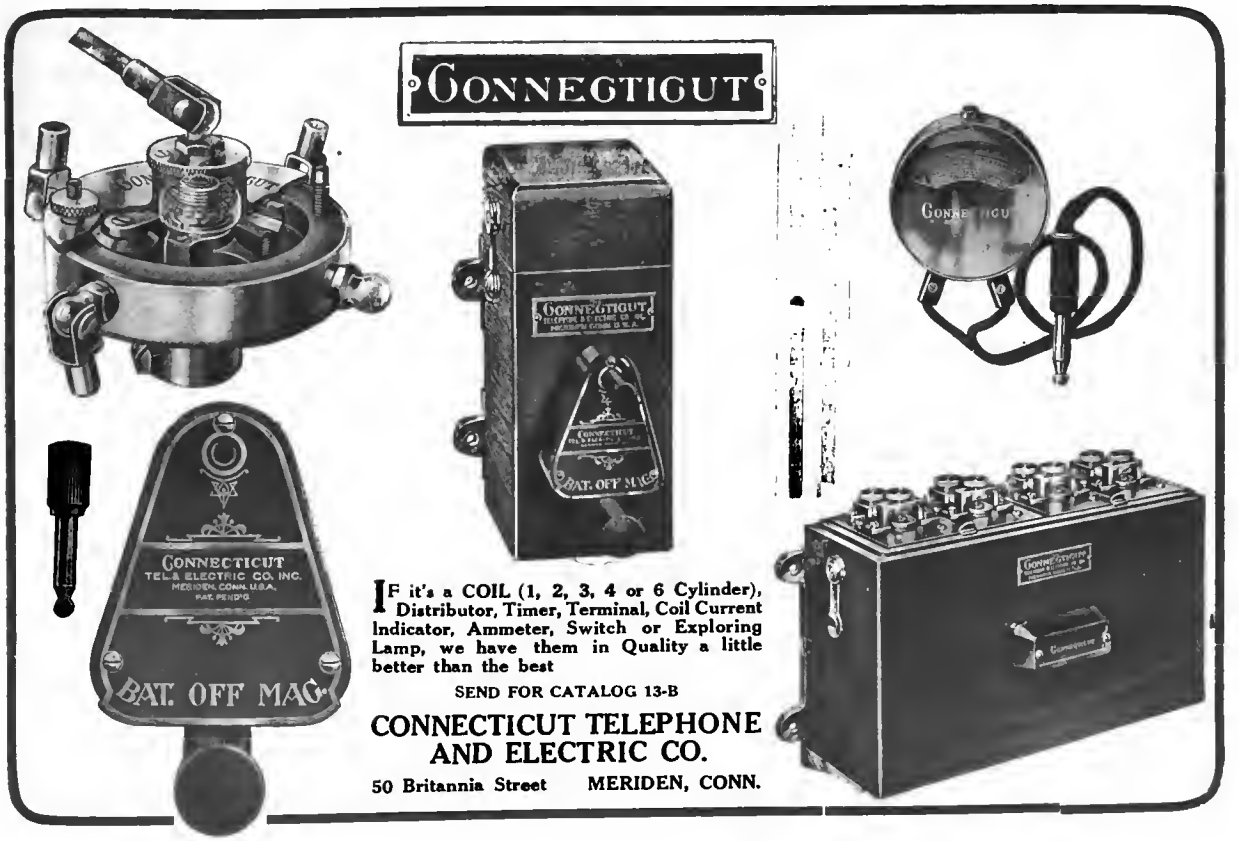
But how long should it "keep going," and what degree of ease in repair is requisite? The standard of Ignition Reliability in the past has been very moderate; and to spend an hour or two a week on the various ignition elements has not seemed unreasonable.

The time is coming when the ignition system will be required, in any reputable car, to do its work with as much uniformity, as little demand for tinkering, adjustment and expert skill, as the valves or the ball bearings.

That is the sort of reliability which users of the Atwater Kent Spark Generator are learning to expect of ***their*** ignition system—and they are getting it.

The Atwater Kent Spark Generator is a high-tension ignition apparatus for multi-cylinder engines. It has a positive mechanical make-and-break, so designed as to run for years without appreciable wear. The moving parts are exceedingly light, and are glass-hard. One spark is made per ignition, and the duration of contact—regardless of the engine speed—is as short as will permit the coil to "build up." Six dry cells last 1500 to 2000 miles. The coil, distributor, spark advance and cylinder cut-outs are as carefully worked out as the contact maker.

Atwater Kent Manufacturing Works 44 NORTH SIXTH ST. PHILADELPHIA, PA.



IF it's a COIL (1, 2, 3, 4 or 6 Cylinder), Distributor, Timer, Terminal, Coil Current Indicator, Ammeter, Switch or Exploring Lamp, we have them in Quality a little better than the best

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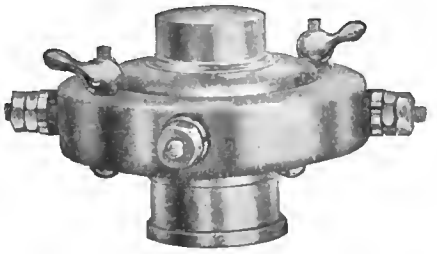
CONNECTICUT TELEPHONE AND ELECTRIC CO.

50 Britannia Street MERIDEN, CONN.

KINGSTON



SPARK COILS
SPARK PLUGS
TIMERS

Larger Output—Lower Cost for 1909
1,000 Coils a Day

Will be our capacity for the next year. This immense output means great reductions in cost of manufacture and a still greater reduction of the selling cost, since every sale of KINGSTON goods sells more without any expense—the high quality of our goods makes friends everywhere—to try them is to use them and to use them once is to use them regularly. The great reduction in cost of production, together with economy in selling end, entitles the user to greatly reduced prices; therefore a new list price for 1909 has been arranged, showing greatly reduced prices on the entire line of KINGSTON IGNITION SPECIALTIES

The KINGSTON line includes Spark Coils for every purpose; Dash Coils; Plain Box Coils; Magneto Coils, specially fast; Motorcycle Coils; Make-and-Break Coils; Mica Spark Plugs, and Timers, all high grade, but at prices based on a reasonable manufacturing cost. The

KINGSTON Line Is RIGHT
High Grade
Reasonable In Price

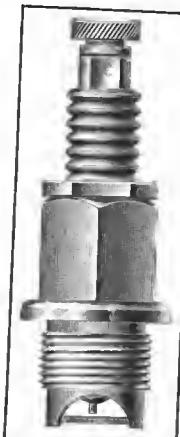
It is easier to sell a high-grade article at a fair price than a high-grade article at a high price or a low grade article at any price.

We want live dealers in every city and town to handle our goods. Write for new quotations and full information. Booklet descriptive of the entire line for the asking.

SEE OUR EXHIBITS
New York: Dec. 31-Jan. 7, Grand Central Palace, Space 154
New York: Jan. 16-23, Madison Square Garden, Space 157
Chicago: Feb. 6-13, Coliseum Gallery, Space 75

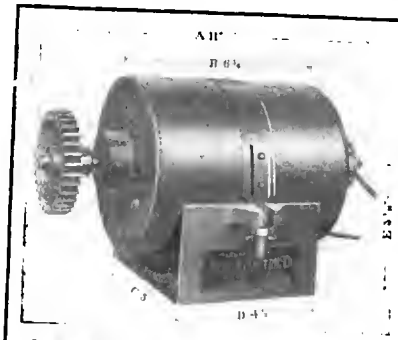
KOKOMO ELECTRIC CO. P. O. BOX 207 **Kokomo, Ind.**

HEINZE IGNITION APPARATUS



Standard ALAM 7/8"-18 thread

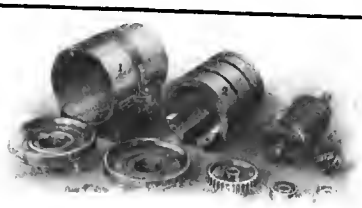
HEINZE IMPROVED MICA SPARK PLUGS



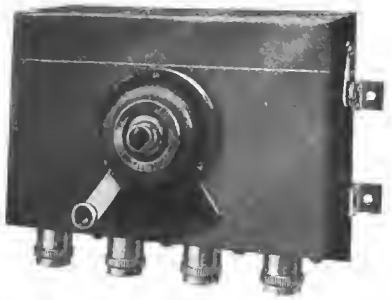
Heinze Low Tension Magneto operating through vibrating coil to spark plug.

HEINZE IMPROVED MICA SPARK PLUGS

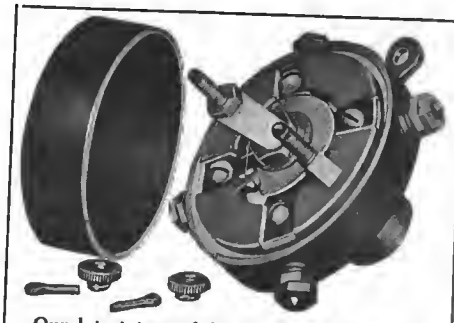
Regular 1/2"-14 Pipe Thread



Showing Magneto disassembled.



Our latest type coil supplied with kick switch for operating either on Magneto or Battery.

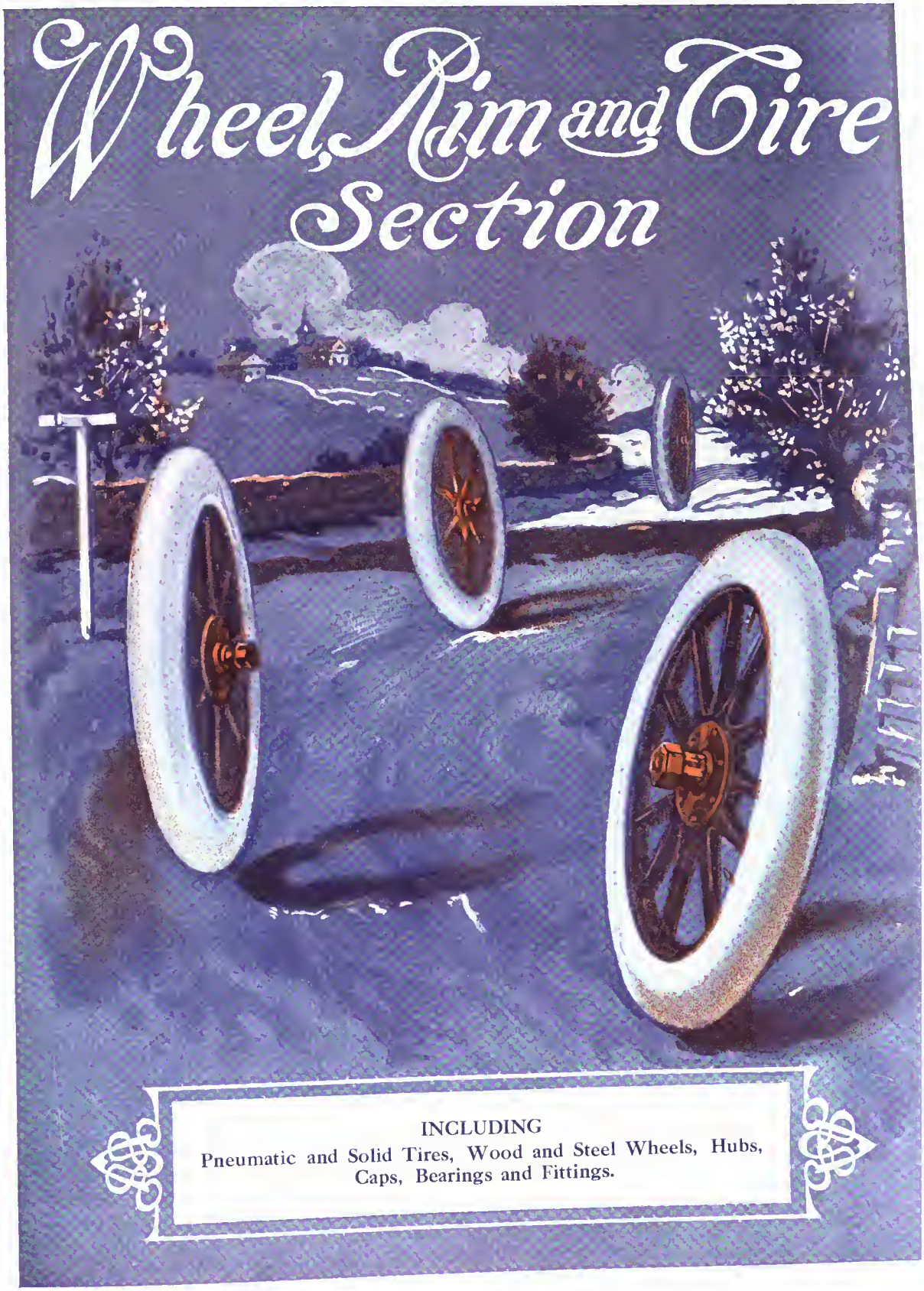


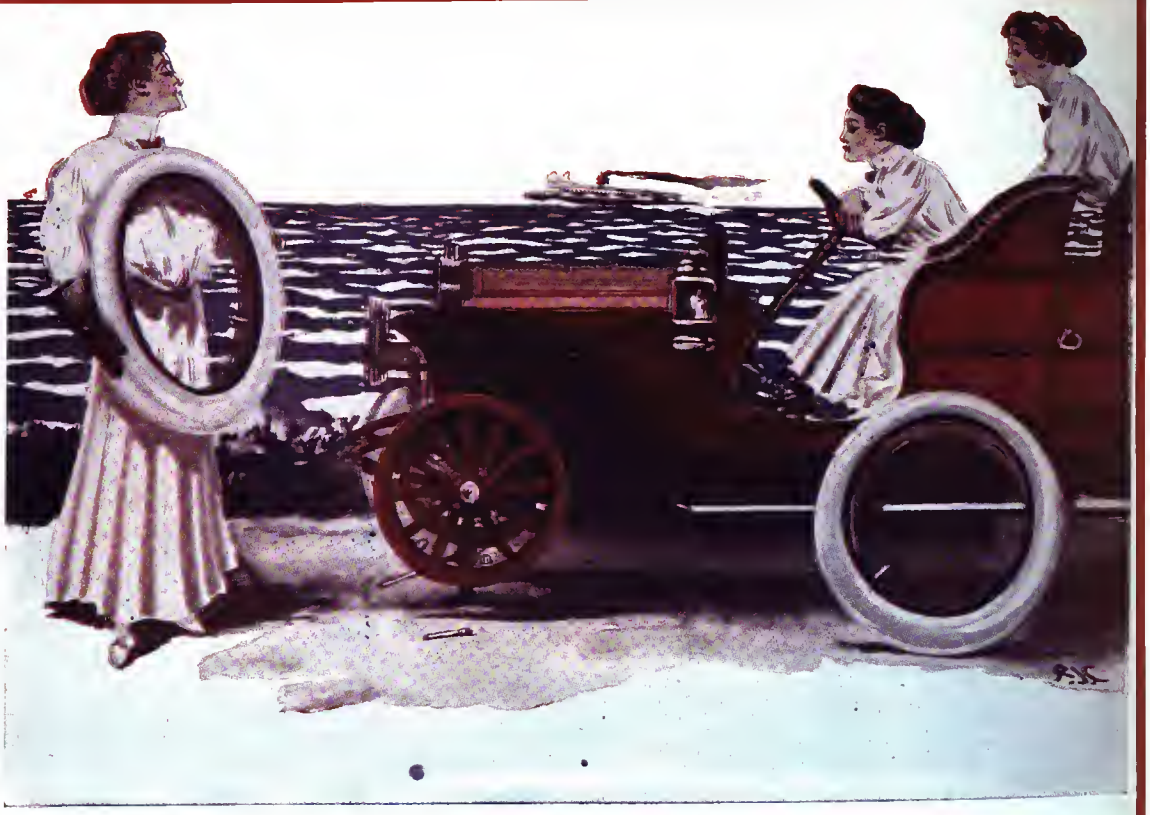
Our latest type of timer with our improved wipe contact, acknowledged by all leading Motor Car Makers to be the most superior type of construction.

HEINZE ELECTRIC COMPANY

Send for our latest catalogue.

Factory and main office, LOWELL, MASS.





A WOMAN CAN MAKE QUICK TIRE CHANGE WITH NADALL DEMOUNTABLE RIMS

THE operation is so simple and easy. Nothing is needed but a wrench to loosen or tighten four bolt-heads which release or clamp the felloe to your tire-rim. In five minutes the old tire is off and the new one in place. No need of fumbling in the dark or cold for nuts and other detached parts. There are no loose parts to a Nadall Demountable Rim. Nothing comes off but the tire and rim.

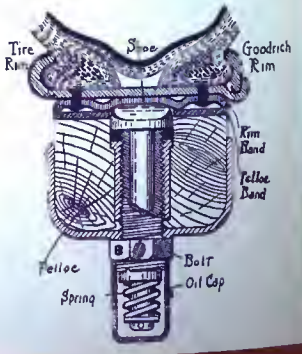
Only DEMOUNTABLE Rim used with a Quick DETACHABLE Tire

This combination is what people must have to avoid delay and trouble for tire trouble on the road. Clincher tires are a nuisance to handle. The detachable tire with a demountable rim requires no effort or mechanical skill and no tools but a simple wrench in the hands of anybody—man, woman or child.

See Our Exhibit at Madison Square Garden, New York, and Coliseum, Chicago.

How the Nadall Demountable Rim Works

Two to four expanding shoes protrude through the felloe rim and fit into grooved depressions on the inside of the rim. By applying a wrench to these bolt-heads the shoes are tightened or released without effort, and the rim quickly secured or released. So securely do these shoes hold that the wheel must break before they could be dislodged. The tire can thus be changed without detaching a single part. An oil cup on bolt-head serves to keep it in perfect condition.



Responsible Agents Wanted to Handle the Nadall Demountable Rim. Address

NADALL MFG. COMPANY

1225 Michigan Ave. **CHICAGO, ILL.**

THE wheelmaker's art is as old as the hills. And there are a good many points in relation to wheels entitling them to more than passing notice. In the first place, the rim speed of a wheel of an automobile reaches the high maximum of approximately two and a half miles per minute. With the idea of illustrating just what this means, it is to point out that the rim speed on the flywheel on a 5,000-horsepower steam engine would be limited to one mile per minute. Wheels for automobiles must be nearly devoid of flywheel effect, and this is an extremely difficult matter, unless the felloes are of wood and of small section. Fortunately, wood exhibits rare qualities under the condition in which it is used in wheels, and the felloes and spokes can be of small cross-section without trespassing upon the desired factor of safety.

The Camber in Wheels.—The better grade of wheels are provided with at least ten spokes for the front and twelve spokes for the rear and the spokes are set at an angle, giving a "dished" effect. This is not with a view to enhancing the appearance, but with the idea of enormously increasing the ability of a wheel to sustain against side strain. The amount of camber given the wheels is enough so that the spokes are appreciable longer than the radial distance from the hub to the felloe. Because of this distance and its influence, a wheel cannot be "dished" by an outside force out of the plane it is given at the time of its construction unless the rim and the felloe part. The reason for this lies in the fact that all the spokes are in compression and all share the responsibilities equally. It is not necessary, then, to have spokes of large section and great weight, whereas, on the other hand, resiliency is imparted to the wheel if the spokes are not of such great section, especially if they are whittled down in such a way as to make them rigid in the sheer plane only. This year's cars have decidedly improved wheels, both as respects the design and in that the diameters are greater than they were in the past. There never was any question as to the undesirability of some of the low diameter wheels used in the past. The wheels lacked resiliency and the tires used were too small to do the work. These matters have been corrected very largely and an attempt is being made to maintain the high standard of second-growth hickory, long the standard wood for wheel-making, and now growing more scarce year by year, thus introducing a considerable wheel problem. This is one of the reasons why steel wheels are used quite extensively, although it is true that steel "disc" wheels are chosen for their great strength, as well as the fact that the service in which they are used demands heroic treatment. Indeed, it is a question if steel wheels may not become very popular in the near course of events.

Hubs in Modern Wheels.—The trend is entirely in the direction of ball and roller bearings for wheels and the hubs are accurately machined from steel castings or die forgings, as the case may be. Provision is made for keeping the lubricant within the hub cavities so that the ball or roller bearings are profusely lubricated. Hub flanges are wide and a suitable number of bolts of good diameter are used to bolt the woodwork into secure relation. There is decided tendency also to have the spokes at the miter very accurately fitted and fastened by glue, so that it will be readily feasible to dissemble the wheels at any time for whatever purpose as, for illustration, a new hub might be substituted at will for one damaged in service.

Something About Rims.—While the clincher type of rim has been long and favorably regarded, the fact remains that the average autoist rarely feels capable of coping with the tire trouble that might arise because of the difficulties involved. Demountable rims came into vogue because there was a demand for means by which tires could be changed by men of ordinary strength under unfavorable conditions. The demountable rims are, apparently, just as secure as the clincher type, and certainly it is much easier to change tires if demountable rims are used. At the present time rims are made of the finest grades of materials and the joint is rendered strong by the electrical welding process. There are several schemes by which the demountable feature is rendered practicable, and experience rather goes to show that any choice is purely as a personal matter.

Improvements in Tires.—The first great improvement in the tire situation came by way of a reduction in price, thus enabling builders of cars to use wheels big enough for the purpose. It would not be far fetched to say that the smallest runabout would have tires as big as we find on the largest touring car to-day, price permitting. The life of a small tire on a big car, in which speed and weight are considerable factors, is too short to be regarded from a commercial point of view. If larger tires are being used at the present time it is also a fact that experience has lent zest to the undertaking and the quality of tires is on a higher plane.

A visit to the tiremakers' plants would show the use of better materials, a more discriminating selection of rubber and refinements in the progress that can only end in better tires. These same refinements and the quickening of the process were, of course, largely responsible for the cut in price, which cut, in turn, as before stated, enable builders of cars to select tires big enough for the purpose. Tires are made in the several well-known standard sizes; they nearly all seem to be of the wrapped tread variety and the non-skid feature is properly cared for just as in the past.

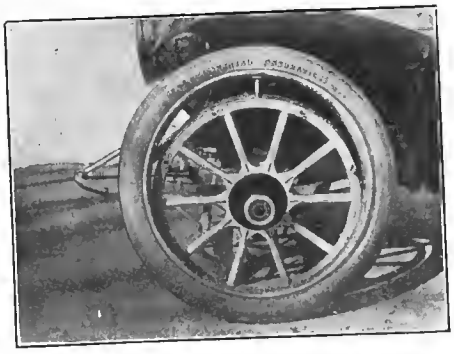
Use of Solid Tires.—Of solid tires and the special forms of rubber tires now much in use a book could be written extolling their well-known virtues and the last word would not even then be said. In trucking work to do without the "solids" would be equal to choosing to do without the trucks. It is quite out of the question to maintain the present pace with trucks considering the use of anything but solid tires or special forms of tires of rubber independently of the well-known pneumatic tires excepting in special cases.

Tire-Filling Compounds.—In certain classes of work the pneumatic tires are filled with a compound instead of air. It will not be possible at this time to discuss the compositions in detail more than to say that they do serve a very useful purpose, and it is due to their use that automobiles are regarded as much improved by the utilization of the compounds in certain classes of service in particular.

Run on Ball and Roller Bearings.—The old types of plain artillery hubs are no longer to be seen. Ball and roller bearings have proven their worth, not only because they "slay" friction, but by reason of endurance as well. The types of bearings available are in such great profusion as to render discussion here futile unless to reiterate their fine qualities.

Continental Ready-Flated Tires

1—Ready-Flated Tire in Position on Wheel



2—Ready-Flated Tire Partly Removed

Permit the carrying of tires already

Inflated

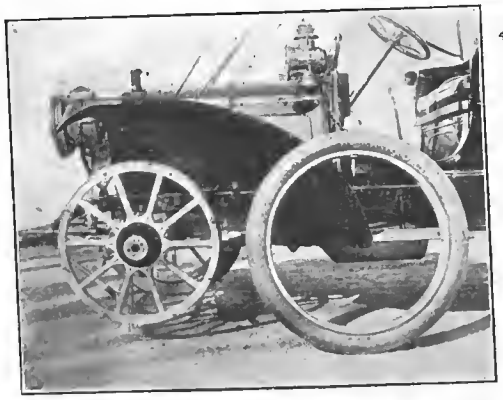
on

Spare Rims

Reduce Tire Expense and make motoring a Pleasure

5—The Finishing Touch

4—Placing Ready-Flated Tire on Wheel



3—Wheel Fitted to Receive Continental Tire—"Ready-Flated"

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Return this coupon and we will send beautiful booklet

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Continental Caoutchouc Company

J. M. GILBERT, General Manager

1788-90 Broadway **New York City**

Branches and Distributing Agents in 18 Cities. DEALERS EVERYWHERE.

Continental Ready-Flated Tires

THESE **popular** tires with **Continental Demountable Rims** will be **exhibited** at **both New York Auto Shows. Every** car manufacturer in America recommends them as the **most** perfect and **economical** tire equipment when the carrying of **spare tires, already inflated,** is desired. **Cheerfully demonstrated at all of our sales offices and orders filled three days from time wheels are delivered.** We know **you** will **want** them on **your new** car, and to avoid delay **you must specify early. Many** present motorists are already "wise"—with them the **fear of tire troubles is a thing of the past. Remember one investment only** covers **all** expense—and **any clincher tire** and standard tube **will** fit. Our beautiful brochure "Continental Ready-Flated Tires" forwarded at your request.

Continental Caoutchouc Company

J. M. GILBERT, General Manager

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Return this coupon and we will send beautiful booklet

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It doesn't take the automobiling public long to learn which tires are giving the best service.

G&J TIRES

are made to give the automobile owner his full money's worth in service—and that they have made good is evidenced by their ever increasing demand. You will make no mistake in specifying them on your new cars.

Yes, we shall exhibit at both the New York Shows. If you will be there, call and see us; if not, write for a copy of our new catalogue.

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Portland, No. 326 Burnside Ave.
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What Good Tires Mean to You

Throughout the world Morgan & Wright tires are known as good tires—because they **are.**

To the motorist this statement of **demonstrated** quality means much, for—

It is a guarantee against wholly unnecessary repair bills—against **all** repair bills, in fact, except those necessitated by accident or natural wear;

It stands for **protection to the car,** which can be secured only by the use of tires that are built to withstand **emergency** tests as well as ordinary service;

It's an assurance that you will be spared the exasperating inconvenience which always attends breakdowns of **any** kind—especially those against which you **could** be protected.

MORGAN & WRIGHT TIRES

have literally **won over** hundreds of motorists by reason of their protective quality—the quality that makes them absolutely safe under **any** condition.

Whether this protection is secured through the grade of materials used, or through our method of tire-building, or as a result of extremely rigid inspection which every tire undergoes before it is permitted to leave the factory, is comparatively unimportant to the user.

The vital consideration—and the only one that appeals to the experienced motorist—is this:

These tires actually stand up day in and day out under every condition of both load and road, as only tires can that are made as MORGAN & WRIGHT tires are.

And it is because users of these tires have repeatedly found this to be true, that we invite **all** motorists to give them an impartial comparative test.

There is no method of making friends
equal to the method of **making good.**

MORGAN & WRIGHT, Detroit, Michigan

Branches, Agencies or Dealers everywhere.

Republic Tires

THAT Staggard Tread is the only satisfactory answer to skidding problems. Other anti-skidding devices (chains, steel studs, etc.) are only for temporary use in wet weather. This tire is for continuous use and is especially valuable in cities where the sprinkling of the asphalt produces dangerous conditions even on fair days.

The Staggard Tread also means longer wear on account of the increased thickness. In fact, the tread is usually the last part of these tires to wear out, since these big studs do not tear off like the small protuberances of dotted treads.

Republic Rubber Co.

Youngstown, Ohio

New York City, 232 W. 58th St.	Seattle.....1419 Broadway.
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Philadelphia.....830 N. Broad St.	San Francisco.....166 First St.
Chicago.....116 Lake St.	Cincinnati...8th and Walnut Sts.
Detroit.....246 Jefferson Ave.	Toledo.....2815 Monroe St.
St. Louis.....3964 Olive St	Indianapolis....208 S. Illinois St.
Pittsburg.....136 Sixth St.	Cleveland....1120 Euclid Ave.
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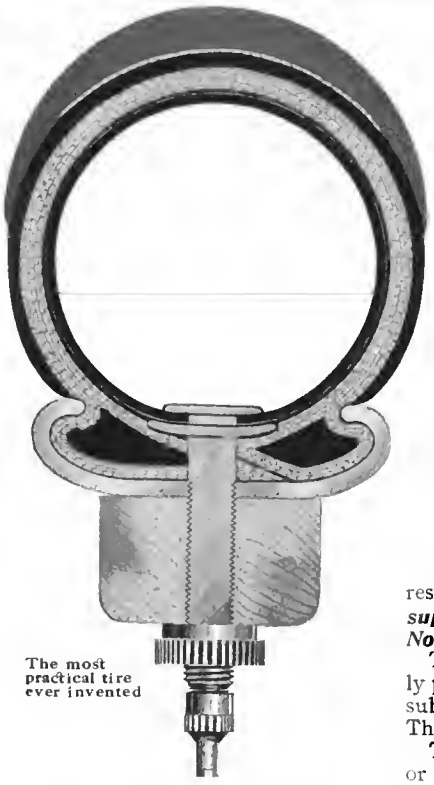
GENESEE MECHANICAL CLINCHER AUTOMOBILE TIRE



The most practical tire ever invented

The Genesee Tire is the *Only* Clincher Tire in the World with the improvements here shown and described.

Speaking broadly, all tires ***except the Genesee Tire*** are of a like construction, differing only as to ***quality.***

Look at this sectional of a Genesee Tire—note the exclusive and ***natural*** wedge lock—and ***mechanical*** lock formed by valve. Not a lug needed—not a bolt needed to secure tire to rim.

Genesee Tires cannot creep. The full, firm foundation is locked to rim by means of valve. The improved formation of it provides ample foundation for itself, and for the inner tube to rest upon. A perfect and complete ***support*** for tire and for inner tube. ***No other make can have this.***

This Genesee construction absolutely prevents water, dirt or other foreign substance from entering the tire. There is no possible space for it.

The inner tube cannot be pinched or chafed, because the inner edge of tire in this construction, as you notice, is ***flush*** with the entire inside surface, thus forming a continuous, naturally round tube. No chance for inner tube to get caught between lugs—there are no lugs.

The entire volume of inner tube is always ***above the rim,*** thus securing the benefit of ***all the air space,*** which means the maximum of resiliency and speed.

The inner tube is supported equally on all sides, which devides the strain evenly on every bit of its area, adding durability and greatest possible mileage.

The Genesee is the only perfectly balanced clincher tire. That is, the weight of the outer edge or circumference exactly equals the weight of its inner edge—the part next the rim. All tire experts have known the good of this principle of weight distribution, but none others have succeeded in carrying it out practically. This feature makes for the maximum of mileage.

This equal division of weight also places all side strains on that part of tire best able to resist unusual strains, and at the same time renders the Genesee Tire absolutely safe against accidentally being stripped from rim.

Tire with Highest Quality

To say nothing of the maker's responsibility, so good a principle embodied in it demanded that the Genesee Tire be as near perfection, in quality of material and workmanship, as human effort could make it.

The very best grade of Old Fine Para Rubber, specially selected; and best obtainable grade of Sea Island Cotton, specially woven to our order; these are the only materials used.

To make good, reliable tires demands a high type of sober, skilled and ***loyal*** men. Our factory located in the heart of the tire-making industry, we know the best men in the business. They are in our employ.

Nothing but the high-grade Gensee Tire is made in this factory. The best thought and undivided energy is being devoted exclusively to the manufacture of this Tire alone.

To the dealer—you can make no mistake in pushing this tire with your trade this season. The quality and construction is first-class in every respect—write for prices.

THOS. D. BUICK CO.
MANUFACTURERS OF
Genesee
AUTOMOBILE TIRES AND TUBES

Flint, Mich.

How To Bring Up A Tire On A Bottle In Thirty Seconds

Goodyear Air Bottle Means No More Tire Pumping

NEVER hear of bringing up a tire on the Goodyear Bottle? Sure! It beats the old-fashioned way of bringing the tire up by hand "all hollow." Not one-tenth the trouble.

And tires brought up on the Goodyear Bottle are well brought up too,—better behaved—more healthy—live longer—do a good deal more work—save you a lot of money.

It's such a big success that we are going to give every motorist in the world a chance to try it free for two years—charging only the nominal cost of the first bottle.

The Goodyear Air Bottle is a small steel bottle charged with pure air (not gas). It is usually carried under the seat or on the running-board of an automobile.

When you want to inflate a tire, you simply attach the rubber tube from the Air Bottle to the tire—open the valve and let 'er fill.

While you stand by and comfortably watch the performance until time to shut 'er off.

Doesn't look much like your old familiar job of giving an imitation of your wash lady in the midst of her Monday morning exercise, does it? Doesn't feel like it, either.

No more back-breaking, hand-blistering tire pumping! That grim task which robbed motoring of its pleasure can be crossed *off your list of troubles.*

Any woman or child can inflate a tire with the Goodyear Air Bottle—it's so simple.

And the beauty of it is that the tire can be brought up to just the right pressure.

This is important. It makes tires last 50 per cent longer. Under-inflated tires give out quickly.

By inflating to *exactly the right pressure* with the Goodyear Air Bottle, rim-cuts and other tire troubles are avoided. Ninety per cent of tire troubles come from under-inflation.

If you have Goodyear Detachable Auto Tires on Goodyear Univers l Rims, the Goodyear Air Bottle will enable you to be on your way a few minutes after the puncture occurs.

And with *any* tire, it cuts out half the work and drudgery.

Any motorist in the last Glidden Tour can tell you what a blessing the Goodyear Air Bottle is. A big truck loaded with Goodyear Air Bottles met the tourists from day to day at the various points of the tour.

All contestants who desired the Free Goodyear Air Bottle service were supplied, regardless of the kind of tires they rode.

Every day the empty bottles were taken back and replaced with fully charged ones.

Thus, the Glidden Tourists always had a fresh filling for a deflated tire right at hand—no delay—no labor.

Altogether the Goodyear Air Bottle was voted the best thing that had happened since the Glidden Tour began.

Write us for our "The Care of an Auto Tire," which gives valuable information about the care of tires and the exact pressure to which each size of tire should be inflated to give the longest service.

Our Offer to all Motorists— Free Air for Two Years

The Goodyear Air Bottle costs only $15 for the small bottle designed to carry under the seat, or $20 for the larger bottle, which is designed for carrying on the running board, filled with compressed air—no gas to ruin the tires, corrode the valves, or condense within a few hours, leaving the tires soft, thus making it necessary to constantly repeat the operation to maintain the desired pressure.

The first cost is the only cost for two years, thereafter we may make a nominal charge for refilling. But for two full years, when the bottle is empty you simply turn it in at any Goodyear Branch or listed agency and receive a new bottle, ready charged.

You do not have to wait. You exchange the empty bottle for a new charged one instantly. Each small bottle will fully inflate four to eighteen clincher tires—according to their size—and each large bottle from six to thirty-five. They will partially inflate many more. The bottles will inflate approximately 15 per cent fewer Goodyear Detachable Tires than Clincher Tires of corresponding size, the reason being that the GOODYEAR DETACHABLE TIRE IS 15 PER CENT OVER SIZE.

See it at the New York Shows, Space 109 Gallery Palace Show, Space 103 Elevated Platform Garden Show

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Milwaukee, 188-192 Eighth Street
St. Louis, 3935-3937 Olive Street
Buffalo, 719 Main Street
Detroit, 251 Jefferson Avenue
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Omaha, 2010 Farnam Street
Washington, 1026 Connecticut Ave.
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New Orleans, 706-716 Barrone St.
Memphis, 181-185 Madison Street
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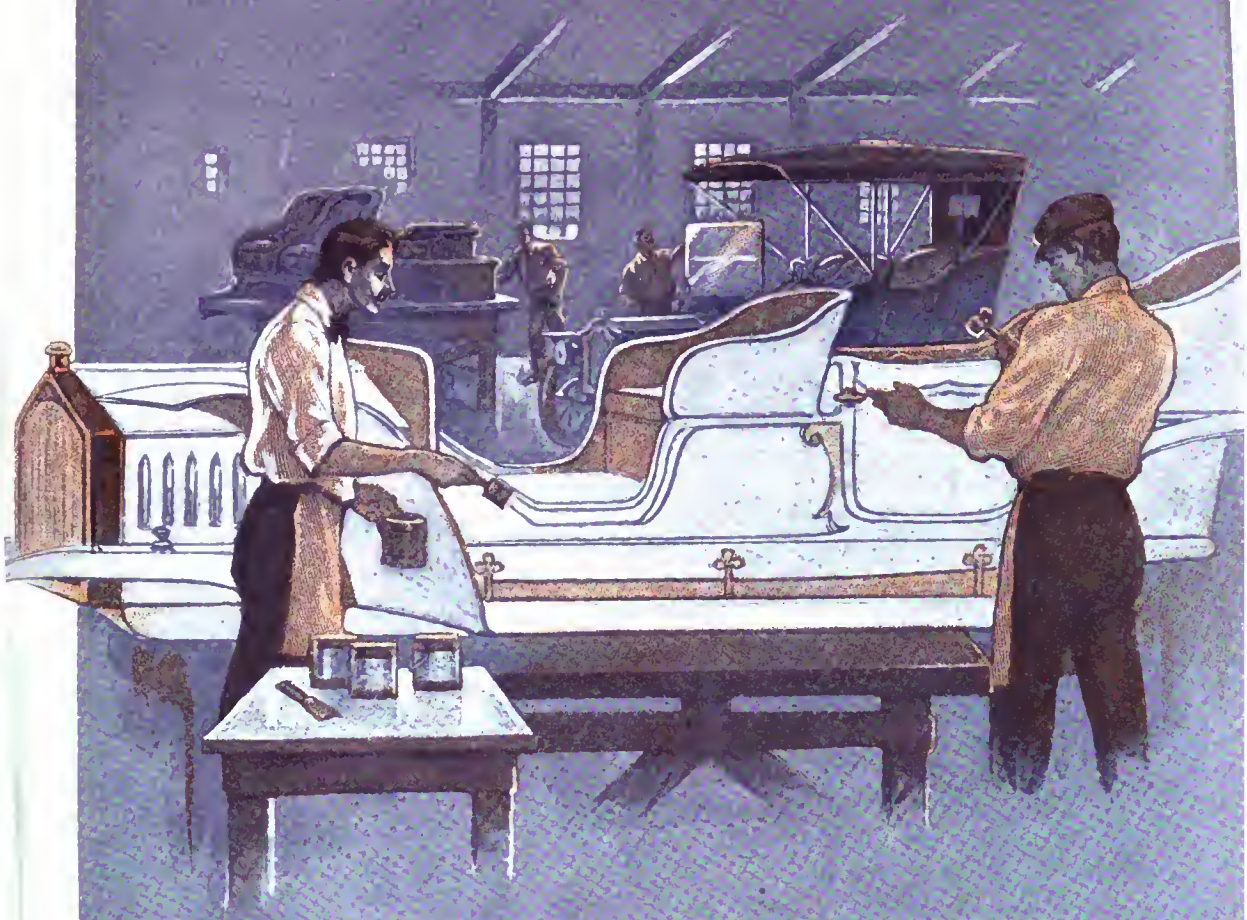
Body Section



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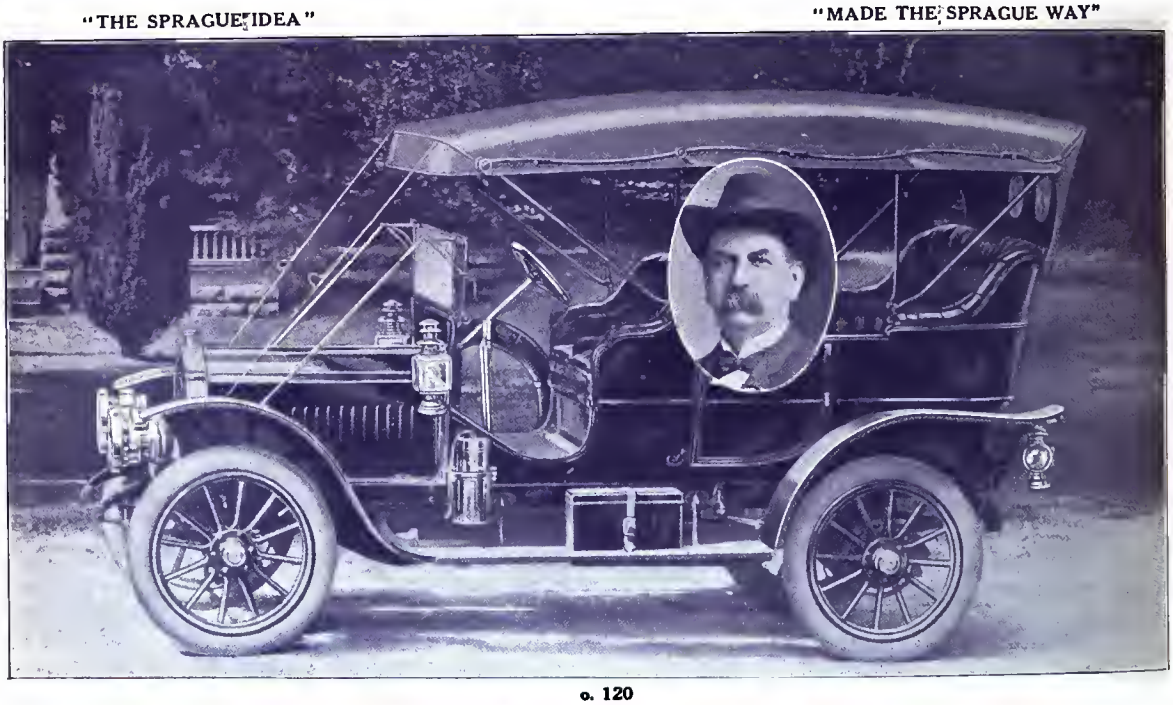
THE MAN BEHIND THE SPRAGUE TOPS AND FRONTS

COL. JAMES H. SPRAGUE

"THE SPRAGUE IDEA" "MADE THE SPRAGUE WAY"



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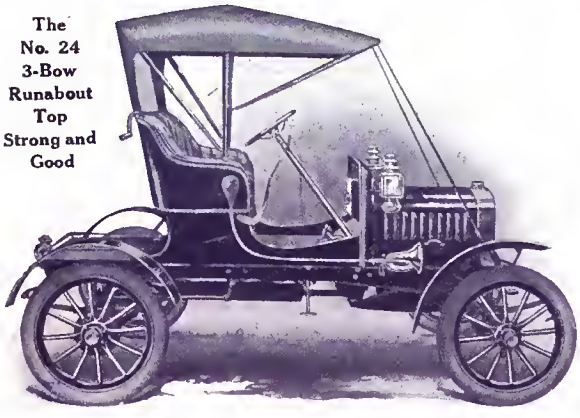
Elegant in detail. Superb in finish. Made as a fitting accessory to the best cars.

If you want the BEST, you can get them nowhere else.

The No. 24 3-Bow Runabout Top Strong and Good



Our No. 70 Solid Brass Front. Perfection, Common Sense.

When you buy a wind shield you should buy the best, therefore you should buy a Sprague. You can see our fronts at the shows on the Elmore, the Pope-Toledo, the Apperson, the National, the York, Pullman and other good cars.

WE WILL ALSO HAVE A FINE EXHIBIT IN ALL THE SHOWS

COL. SPRAGUE WANTS TO SEE YOU

ASK FOR OUR NICE PRICE LIST AND ELEGANT CATALOGUE

Regardless of what others may claim we still have over five acres of floor space in our factory.

THE SPRAGUE UMBRELLA CO., Norwalk, Ohio, U. S.

FROM the rear entrance tonneau to the elaborate creations of two or three years ago were as echoes from abroad. The makers of bodies in America ultimately reached the conclusion that utility and stability ought to have something to do with the project. The side entrance is an American idea, but it did not reach the point of its full significance until American designers interjected a little common sense. The swanlike curves and fantastic configuration so dominant in the late creations have given way to straight line work, comfortable seats, and the requisite amount of foot room. It is no longer possible to induce an autoist, or, for that matter, a builder of automobiles, to consider any scheme of design that savors of the proverbial sardine box.

In bodies of the past the distance from the top of the cushions to the deck ranged from 16 to 18 inches, while in bodies of the present time the average distance is scarcely more than half of the value above given. In the earlier types of bodies the distance from the seat panel to the dash, or between seats, as the case might be, ranged around 20 inches, while in modern work the minimum distance is about 25 inches. In the old days, when designers wanted to know how high to make the seats, they measured the height of a chair from the floor, while in the new bodies they took into account their experience in automobiles. In the course of time it dawned on designers of bodies that racing drivers insisted upon seats very close to the deck, and they seemed to be able to maintain their positions under strenuous conditions for hours at a time, whereas autoists perched high in the seat were much fatigued in a hundred miles of travel. The influence of racing is to be seen in bodies at every hand.

The Several Types of Bodies Extant.—Runabouts, roadsters, five-passenger touring, seven-passenger touring, limousine, brougham, victoria, landaulet, cabriolet, surrey, taxicab, and the types of commercial bodies, as delivery and truck. From the runabout to the seven-passenger touring car, inclusive, the bodies are practically all straight-line effect, and special mention should be made of a comparatively new type of body known as the "close-couple," in which a rumble seat is placed over the rear axle and behind the rear seat proper, thus affording seating capacity for six in cars of a wheelbase length to take a seven-passenger touring body. In the close-couple design the idea is to afford a place for the chauffeur during the time when the owner holds the wheel, and thus the owner is allowed the pleasure of driving the car and greater privacy is offered the party by seating the chauffeur in the rumble seat. This close-couple body has other advantages, among which it might be mentioned that the occupants of the rear seat within the body proper will not be jolted to anything like the same extent as they would be were the rear seat located over the rear axle.

With a view to the greatest possible convenience, numerous of the runabout types of bodies are provided with a folding or rumble seat on top of the tool box in the space available at the back. The little cars are, therefore, more commodious, and they certainly present a better appearance.

Offerings in Runabout Types.—Numerous of the runabout types of bodies are provided with a folding or rumble seat on top of the tool box in the space available at the back. The little cars are, therefore, more commodious, and they certainly present a better appearance, eliminating the "dinky" effects so abhorrent to owners of small cars. These bodies are, of course, prototypes to a smaller scale of the roadster type of bodies to be seen at every hand.

The builders of cars now consider the body question and the space needed to a far greater extent than they did in the past, and in side entrance cars the width of the entrance is generally about 22 inches, far enough towards the front to permit the door to be opened wide without interfering with the rear mud guards. In the shaft drive types of cars the sprocket wheel fender is absent and the side entrance is unobstructed. These improvements naturally indicate an increased wheelbase over cars in the past, and the new drop frame idea has permitted the body makers to drop the sills of the side entrances in the average about six inches, without interfering with the spring play, which is about five inches in the good examples of cars.

Town Car Body Work.—In town car bodies and bodies for taxicabs, the driver's foot room is reduced to the minimum. The motors are made as short as possible, and the wheelbase is made within a hundred inches, yet even so the side entrance is provided with a wide door and the space for the occupants is roomy, with spacious seats, while easy riding qualities are assured through having the seat to the front of the rear axle.

When reference is had to artistic effect and distinctive elegance, it would be a fallacy to assume tbat the straight line types of bodies are at the expense of art, and while it is impossible to say that art cannot exist without utility, it is a fair assumption that utility does not exist to the despair of art. These requisites can reside in harmony, and they do. The modern body maker has solved this difficult problem, and it will not be possible to charge him with spreading out too thin because he has made a residence for symmetry in all the cars from the runabout type to the most luxurious types of town cars.

Materials Used in Body Work.—These bave changed but little in the last two or three years, unless it is to note a more extended use of sheet steel. In some cases this sheet steel is aluminum coated or otherwise suitably protected as against the formation of oxides. At all events, metal bodies are looked upon with much favor; they are very prevalent, and aluminum is still used extensively. The framing work is invariably of wood and the center of gravity is held extremely low. Coming down to the finish proper, there are two fundamental ideas, one of which takes into account painting along lines consistent with machinery practices in which pure lead and zinc ground in pure linseed oil form the basis, while the effects are due to color. If more than the natural luster is desired in this class of finished work, the requisite quantity of varnish is added. A high finish can result from this practice, and bodies so treated will stand a vast amount of washing and rough usage.

For the more costly types of bodies in which the finish is to be the limit of the carriage maker's art, the old standard practice is maintained, stopping off at from 18 to 21 separate applications of finish. The upholstery in the better class of bodies is in hand buff leather of the best selections, with occasional examples in suitable cloth fabrics, notably in town cars. For the less expensive types of cars machine buff cowhide obtains.

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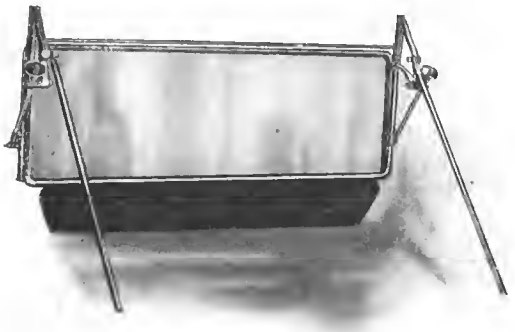

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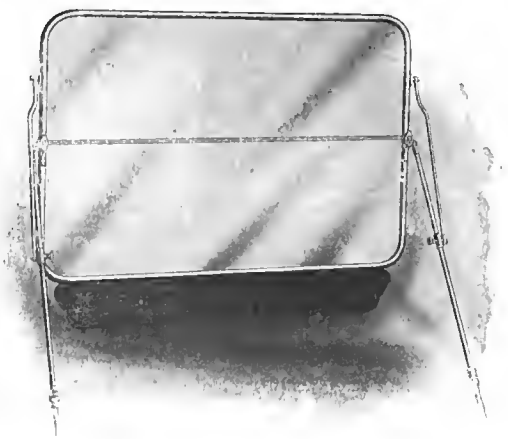

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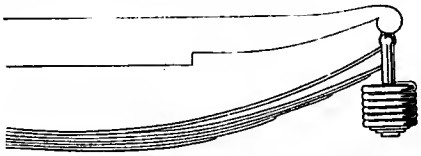

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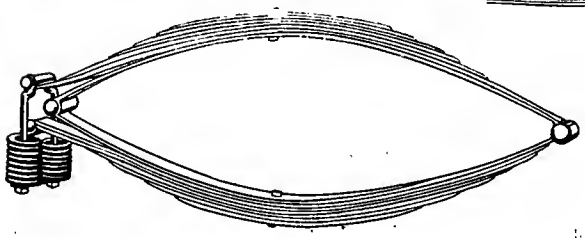

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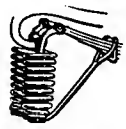

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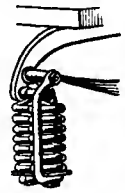

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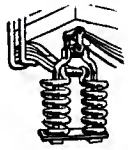

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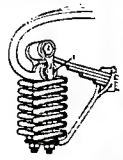


No. 7 Scroll End Spring

Front Springs

No. 5 Shackles attached direct to spring above spring end

No. 6 Curved Hanger. Shackles attached to hanger below spring end

Prevailing Chassis Features

IN the automobile it would not be out of place to refer to the frame as a chassis, nor is it a stretch of the imagination to include the accessories of a frame as springs, etc., together with the axles and the wheels on which they roll. It seemed far fetching to include the power plant, and so it has been discussed separately, and the wheels, the products of an ancient craft, are excluded from this discussion, as they are entitled to separate consideration.

For the present, confining the discussion to the chassis proper (frame), it may not be out of place to lay stress upon the features of the most importance, but the least discernible. A casual observer from the paint that covers the frame might pronounce the frame as good, if perchance the finish makes it look good. The modern automobile maker has the happy faculty of seeing things as they are, and frames of cars as they abound are no longer of cold pressed, mild Bessemer plates. It is the present practice to use fine grades of steel, the quality of which is fairly represented in the mere statement that it will stand in the cold bending test 180°, and, flattened down, without showing signs of distress under a twenty to one glass.

Prevailing Shapes in Frames.—The channel section seems to spell finality, but wood has its strong points. Mathematically, this section holds forth the promise requisite to the occasion, and, practically, this same section lends itself readily to the process. Because of the fine materials and the willingness of the channel section to conform to intricate shapes, the drop frame has come into vogue, thereby rendering it possible to lower the center of gravity, besides facilitating entrance and egress of the car. This same readiness to conform to shapes renders it feasible to fashion the lateral members in a manner agreeable to machinery equipment.

The most recent products are to the gradual elimination of castings at any point on the chassis, and in some of the examples it is to note the presence of pressed steel instead of parts by the drop forging process. The object of resorting to the use of pressed steel fittings instead of forgings is with a view to decreasing cost without suffering a diminution of quality. In the abstract steel plates are of greater strength and in better condition than drop forgings. In the process the pressed steel parts would retain their quality, assuming the riveting is given a due measure of attention. That the builders of cars are fully alive to the advantages of the respective methods is a matter that can be easily settled by merely glancing at the products. They use drop forgings where they will best serve the purpose, and they resort to the use of pressed steel to a marvelous extent.

A Strong Differential Bracket.

Spring Suspension in Automobiles.—There is no one detail of such great importance or so difficult to manage as that of evolving easy riding qualities and longevity of the supple members. The quickest way to break a piece of steel is to subject it to alternating deflections in reverse. Springs have to sustain under these conditions, especially springs in automobiles. They have to be worked to a point near the elastic limit to engender easy riding qualities, hence kinetic ability must be the marked characteristic of the steel employed for this purpose. The improvements wrought in spring steel and in the treatment of the same can scarcely be adequately described in a word picture. In the old days steel that would stand up to half a million of vibrations under the stress of half the elastic limit was said to be good enough to place in a safe deposit vault, but the automobile makers of to-day are making strenuous efforts to exceed one million six hundred thousand vibrations at half the elastic limit. The value stated is extremely high.

It is now a fairly well established fact that the quality of steel, the features of design, and the mode of treatment are the factors of importance rather than the mere question of the types of the springs adopted. Types of springs can be adopted to suit the general features of cars, and the level platform, so much to be desired, will mostly depend upon the other factors.

Practice in Axle Construction.—Front axles are very largely of the "I" section, while knuckles are of divers designs, as Elliot, Lemoyne, Mercedes, etc., with splendid proportions of the steering mechanisms and a special reference not only to liberal bearing surfaces, but adequate means of lubrication. When reference is had to rear axles, the types diverge, depending upon shaft or side chain drives. In the cars utilizing the side chain drive, the "I" section axle is in full force, and it is not uncommon to observe the distance rods of the same section, primarily because of its strength.

With live rear axles there is still a considerable amount of featuring in various directions, but it is plain to be seen that all designers are in favor of increasing the ground clearance under the different housings and increasing stability by the use of more stable truss rods, if they must be used at all. There is a prejudice in favor of the elimination of truss rods, and there are a few examples of rear axles in which

A Characteristic Sub Frame.

autogenous and electrical welding methods are resorted to with a view to the fashioning of the enlargement of the members to accommodate the differential housings in this class of axles.

Semi-floating types of rear axles seem to be very common, and designers are pretty evenly divided between transmission sets in conjunction with rear axles and the same transmission sets as separate units swung on the frame, excepting in the self-contained power plants, in which the transmission sets are integral therewith. Of materials, it is to note the same degree of improvement along consistent lines.

Some Ruling Dimensions.—The advent of the long wheelbase has brought about specific reforms by way of stiffer frames, an increased number of laterals, and better ties. It is now a fairly established fact that the chassis frame should be relatively heavy, if a level platform is desired. Road inequalities, as they affect the springs, will react with a consequent secondary motion of the lightest series. If the chassis frame is heavier than the parts below the springs, the motion will be imparted to the parts below (axles, wheels, etc.), rather than to the frame itself. The law says "a mass will be diverted from its habitual direction to an extent inversely proportional to the weight," etc. Result, if the axles, wheels, and parts below the springs are lighter than the mass above, the excess motion will be imparted to the series below. The cars of to-day are in harmony with the laws, and the builders of automobiles more nearly understand how to bridle the forces.

Improvements in Materials Demanded by Service.—There is no part of the automobile that has undergone so much change in so short a time as the materials used in the various parts of the chassis. The earlier examples of cars had side members of regular structural shapes, as T's, L's, and, for the heaviest work, channel sections. The material used in these products was substantially mild steel in which the mettaloids were held at quite high values. The introduction of the pressed steel frames in irregular channel sections was not at first attended by the utilization of fine material. It was soon found that alignment was conspicuous for its absence after a little road service, because the materials of which the side frames were made had not the requisite rigidity in the first place, and no attempt was made to countcract the ills of sagging.

Discriminating designers soon reached the conclusion that special grades of material would be necessary, and that sagging would have to be fortified against by some means or other. Some of the more ingenious of the designers proposed to put an initial sag in the side members by merely shaping them in the press with an upward camber and in the later process subject them to sufficient pressure to bring on a permanent set, incidentally eliminating the upward camber, hence straightening them out. This practice was resorted to in notable cases, and frames so constructed rarely, if ever, gave any trouble at all.

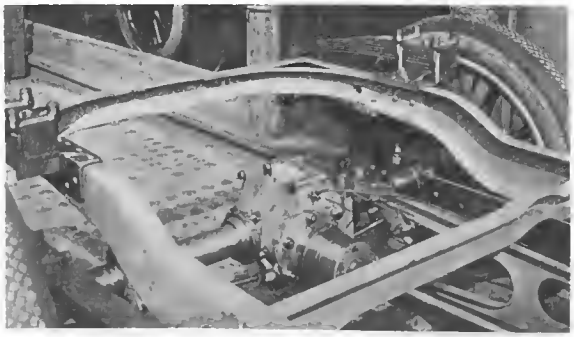
Other improvements were by way of deeper channel sections and a greater width of flanging at critical points, but the greatest gain, aside from the matter of correct design, came from the use of the finer grades of alloy steel. In some notable instances nickel steel, quite low in carbon, was adopted, and silicomanganese products have found a wide application. A goodly number of the frames, however, are the product of spring steel of the low carbon genera. Certainly the materials that would serve well in springs would logically serve as side members, because while it is true that spring steel has certain properties requisite in springs, it is at the same time a product of a high initial rigidity. This is not to say that the conventional spring steel of the market as ordinarily used in railroad car springs would be valuable for this purpose.

Rear Spring Suspension, with Side Chain Drive.

Some of the best examples of cars employ "government inspected" boiler plate in side frame members. This is, of course, fine material to work, and it seems to stand every test, as well as the exigencies of service. Its underlying characteristic involves the use of fine grades of ore in the O. H. process, limiting carbon to about ten points. There are special lines of side frame material to be had, but it is doubtful if they differ very much from what are generally known as the better grades of flange steel, or, for that matter, of the boiler plate above referred to.

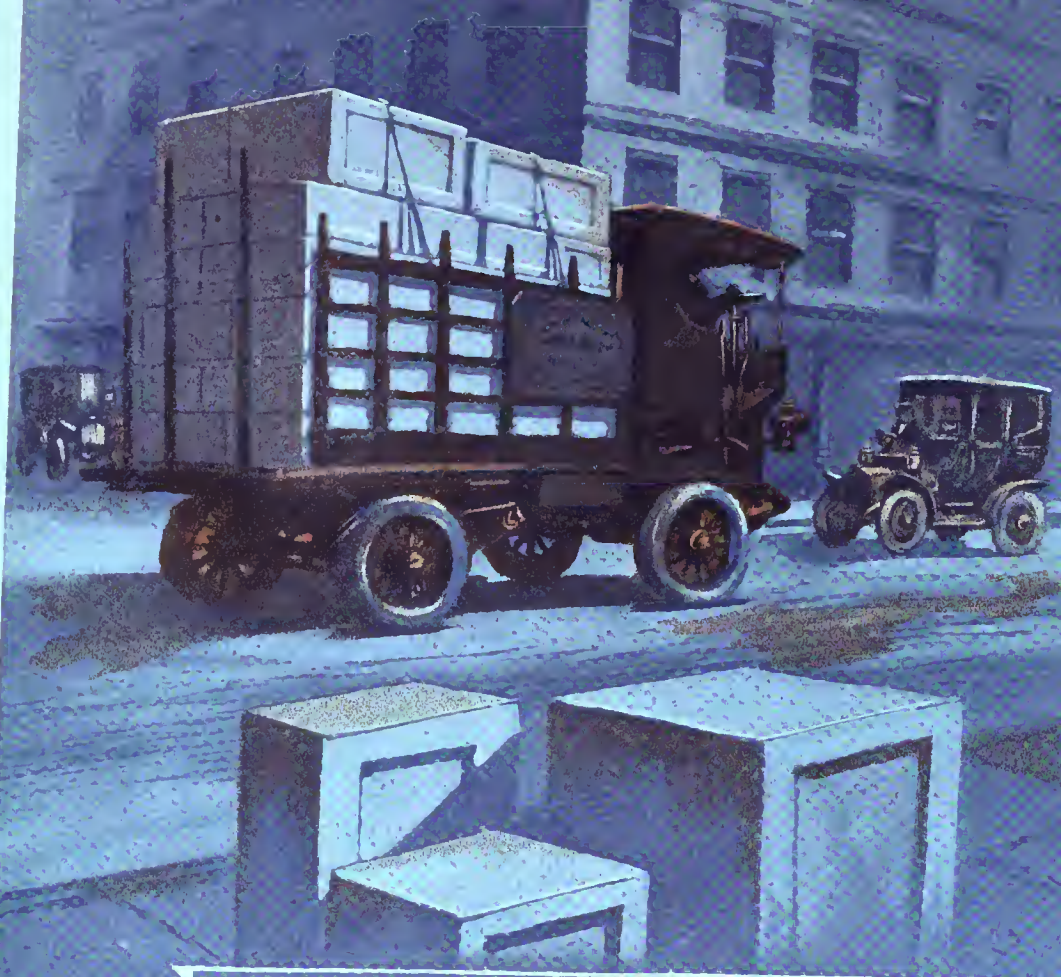
At all events, irrespective of the exact grades of materials used in the different cars, there are none so poor as to support the ordinary grades of steel as found in the cold pressed side members of even two or three years ago. But this is not to say that unsatisfactory service was due to materials even in the majority of cases, since some of the earlier designs looked as if they were fashioned for the specific purpose of failing in service. Of course they were not; the problem was new, and designers lacked experience. A controlling factor was oftentimes a distinctive appearance.

It was not at first supposed that lateral supports would prove to be of any great advantage by way of stiffening the chassis as a whole. It was soon found, however, that the examples in which the lateral members were well designed seemed to do the best work, affording the greatest measure of rigidity.



A Characteristic Drop Frame.

Commercial Car Section



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HART-KRAFT

Commercial Power Wagons

A REVOLUTION IN COMMERCIAL CAR CONSTRUCTION

Delivery Wagons that DELIVER QUICKLY ECONOMICALLY and SURELY

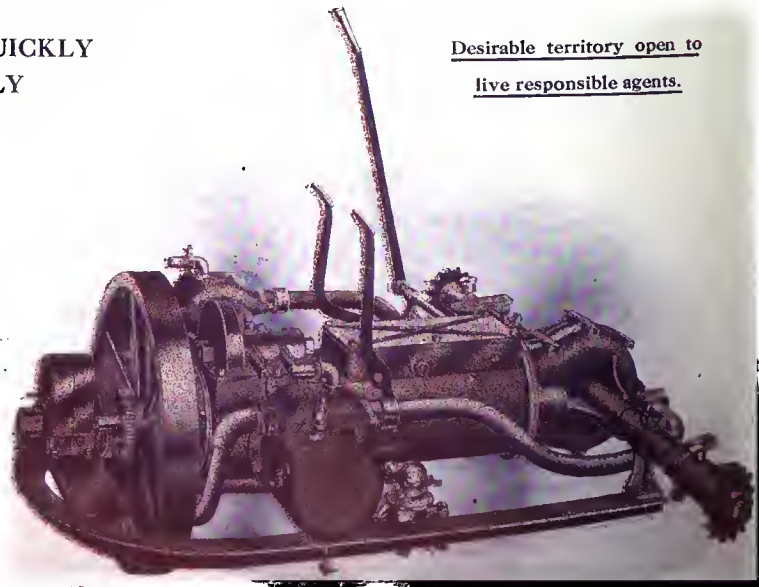
Desirable territory open to live responsible agents.

Manufacturers

Hart-Kraft Motor Co.

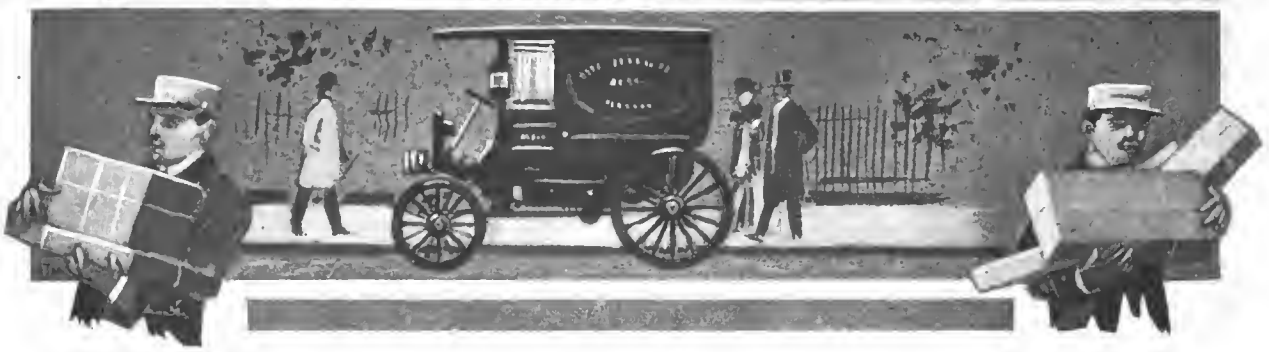
YORK, PA.

New York Distributors:
POST MOTOR CO.
1623 Broadway



Unit Power Plant

The Automobile in Commercial Work



PLEASURE, then profit, seems to be the logic of the autoist. At all events, the pleasure types of automobiles were perfected first, and the commercial types were the product of necessity. The automobile as a mode of motion and a means of transportation can no longer be denied its place at the head of the line, nor will it be subdued in its onward march until it stands in the light of "lock, stock, and barrel."

Of the commercial automobiles, there are steam, electric, and gasoline, named in the order of their coming.

Steam is widely the underlying principle in tractors and heavy trucks, with a growing tendency in the direction of the lighter trucks and delivery wagons.

The electrical automobile long dominated a certain zone, which, for brevity, can be set down as the "short haul" of the electrical commercial, they range from heavy trucks down to light delivery wagons.

The gasoline commercial was slow in coming, but from appearances it will persist in staying. The gasoline automobile may now be seen in divers forms as trucks, tractors, and deliveries. There seems to be no limit as to capacity, nor is the nature of the merchandise to be transported, of necessity, taken into account.

The trend is away from the old practice of trying to impress a touring car chassis into commercial work, and account is now taken of the conditions that surround the work to be done rather than to placate the forces of the shop in which the automobile may be constructed.

It would be very nice, were it possible, to make one chassis serve in all zones of activity. It is very discouraging to try and fail. In all cases thus far, failure (certainly not success) has attended the effort.

This fact probably had more to do with the retarded use of the commercial automobile than any other dozen of conditions The labor problem and the personal equation generally is even now a retarding factor; much improved, however, partially because the automobile has been simplified, and, again, due to the education of men generally in the ways of the automobile. The especially devised commercial automobiles of the present time are so perfectly simple and devoid of delicate parts as to assure freedom from harassing and costly interruptions, if only the operators will confine their attentions to the simple process involved in running the cars. The screw driver, the monkey wrench, and the squirt-can may be left in the garage, and the cars will serve well their respective purposes.

The commercial automobile situation, as it may be regarded at the present time, includes the divisions as follows:

(1) taxicabs;
(2) heavy trucking;
(3) suburban express;
(4) general delivery work;
(5) utility-pleasure automobiles.

In addition to the sub-divisions above set forth, there are divers uses to which the automobile may be put to that will not be elaborated upon here, since the cars do not have to be especially devised for the purposes. In other words, within certain limits, a given model can be used for several commercial purposes, and serve well.

Characteristics of Taxicabs.

In a general way, taxicabs differ but slightly from town cars The town car in private service is maintained on a little higher plane as respects appearance than the taxicab in public service. The underlying mechanical features would be common in the two types of cars. The body work would be a little more stylish and a little less stable in the town car proposition, whereas the taxicab service body should be of neat design, but of great stability. The taxicabs promising most at the present time are of moderate power, short radius of turning action, and easy on tires, which is brought about by way of the elimination of unnecessary weight and good spring action.

Taxicabs are especially economical in the use of gasoline, and, with the customary supply of this fuel, they have a wide radius of action. The cost of maintenance on the whole is extremely low, and the operator is not expected to be able to make any repairs at all. It is but rarely that taxicabs become disabled in the street (accidents accepted), and it is better, in view of this fact, to do without the class of labor that would turn every side street into a repair shop. There is nothing that would retard the patronage of taxicabs so much as the spectacle in its disagreeable aspect represented by a man of no great skill tinkering with a taxicab that refuses to run.

Growing Field of Heavy Trucking.

"The seventeen mule team" hitched to a "prairie schooner" is the best illustration of the stupidity of man that can be found in any land. It is slowly percolating through the centers of intelligence of those who require goods to be transported that the automobile truck is here, and is available for use for every purpose of goods transportation without any limit whatsoever and on a basis of decreased cost per ton mile of the goods transported. If the automobile truck has appeared to be backward in connection with the work in question, it has been through lack of appreciation on the part of merchants rather than lack of ability of the trucks. These outside retarding influences were unfortunate, in that they made it impossible to acquire a full measure of experience, and on this account improvements seen to-day at every hand may be regarded as tardy.

In this zone of activity honors are pretty evenly divided, although in the past the extremely heavy work was done by the "steam lorry," while the average commercial undertakings were partial to electrical trucks. Gasoline trucks did not come into vogue to any great extent until very recently, mostly because the builders of gasoline cars had about all they could handle in pleasure work. A few of the companies handled the commercial situation as a side line, merely converting their

chassis into light trucks, and delivery wagons. This was more a misfortune than anything else, due to the great difference as between pleasure cars and cars required in the transportation of commercial lines. The gear ratio in such cases would scarcely lend itself, and many failures were directly traceable to the use of sprocket wheels with as few as eight teeth. A given motor cannot drive a car as fast as possible and haul a load as big as possible at the same time.

The High Speed Transportation of Goods.

If the heavy trucks are confined to a certain class of work at a slow speed, the modern delivery automobiles make up for any loss of time in connection with suburban express and general delivery work. A single delivery wagon, as they are designed to-day, will make from three to four trips per day, as against one trip with a span of horses. The automobile will do this work "rain or shine" and in the extremes of temperature. These special cars are provided with a commodious platform, are no more limited in load capacity than any other vehicle, and will make as high as 20 miles per hour, as against a quarter of this speed with horses. The same men who formerly handled the horse-drawn delivery wagons can be, and are, used, in automobile service. The labor item is reduced to about one-fifth of that in connection with horse-drawn vehicles, while the advantage of quick deliveries by way of satisfied customers is difficult to estimate, and is rarely ever adequately taken into account.

There are advocates of the automobile delivery wagon who are firm believers in the future of the automobile to the extent that it will displace every other means of transportation in local hauls. Any one who will take the trouble to trace the ramifications through which a small package will have to go in transit from a store in a city to a purchaser in a suburb, not 20 miles away, will quickly reach the conclusion that a single handling and a direct automobile transport is inherently economical. It is the inherent economy that will obtain in the long run, retarded only for a time because of the compactness of commercial organizations so busy conducting a complicated system that they have no time to recognize the merits of a direct method.

Utility-Pleasure Automobiles.

Merchants in a small way are fast becoming used to the idea of displacing the single (horse) delivery wagons in favor of automobiles, so designed as to serve in delivery work during the week, to be converted into pleasure autos on Sundays and holidays. This very large field is being exploited by small cars of considerable merit. The cost of this service, under suitable conditions, compares favorably with the cost in the old way. Runabout types of automobile with suitable body modifications serve well the purpose, especially in the cases in which tires are afforded a reasonable measure of intelligent attention.

High Wheel Types of Delivery Wagons.—In this connection it may be well to mention the advances now being made in high wheel cars in which it appears, some of them at any rate, are finding their way into commercial work, especially for use in the grocery trade and in the service of small merchants generally. This class of cars are of low cost, simple to operate, and they can be converted into pleasure vehicles at will, at a moment's notice. In the towns and villages throughout the land the roads are not so good as to be easily negotiated by cars with a low clearance, especially in the winter time, if there is much snow on the ground. The buggy type seems to serve well the purpose under such conditions, which is a guarantee in itself that the same type is not limited, since if it will do under adverse conditions there is nothing to prevent its working under favorable circumstances. In whatever service the type will serve, it is bound to impress itself, primarily because the first cost is low and in view of the ease with which it can be converted. The simplicity of the type is an assurance that the users will be able to master the same even though skill may be at a low level from the mechanical point of view.

On the whole, the experimental side of the commercial situation passed off smoothly, and the absolute failures were few and far between. They consisted, for the most part, in ventures of a most shady sort, ventures in fact that could only end in losses, as almost anyone of reasonable knowledge of the industry might have predicted. Inventing to fill a long-felt want, which is a practice not uncommon, is always attended with dangers, and it was mostly along such lines that the industry stubbed its toe, so to speak. As the automobile accumulated stability, which was a matter of going slow enough to imbibe of experience, the commercial situation expanded, and to-day there is no chance of failure, nor can it be said that much less than signal success will attend efforts to utilize commercial automobiles in every single instance in which merchants have goods enough to transport to an extent that would keep a hand-cart overburdened.

The old idea of using the automobile as an advertisement is a dead issue. There are now too many of them in use to enable any user to "stand out" as more enterprising than a hundred dozen of his equally prosperous competitors. To-day the commercial automobile is used because it will do more work, and more prompt work, than can be done in any other way. By more prompt work, it is to say, the given quantity of merchandise can be moved in less time. A canal boat will serve to transport goods by wholesale, only time is taken in the process. A railroad will transport the same bulk in far less time. It only pays to use the canal if time is no object. In a big store time is money, because the rent and the other charges are enormous, and they go on, measured only by the tick of the clock. With a canal boat, if the goods are not in immediate need, they are purchased on a low market, and the time taken in their transportation is an advantage, since storage charges will not have to be paid in the meantime. The low freight rate, coupled with the "free storage," renders canal methods especially desirable, which, however, represents a mode of procedure that is foreign to the merchant, whose customers want the goods they order the day they are ordered.

Comparison of Transportation Cost, Auto vs. Horse.

There has been a good deal of discussion in relation to the question of the relative cost of goods transportation, considering animal-drawn vehicles on the one hand and automobiles on the other. Much of the discussion was without good foundation in that the comparisons were not fairly presented. A biased advocate is bound to disregard the side he does not intend to represent, and he is prone to misrepresent the side he espouses. Such presentations are damaging to both sides of a case, and reliance must be placed on the good judgment of those who are the unwilling audience in such instances. In any event, the proof of the pudding is in the eating, as they say, and the merchants who sampled the commercial automobile must have liked the flavor, since the industry has grown and prospered.

Notwithstanding this growth, there is still much opposition to overcome, due in no small measure to the presence of "horsemen" in charge of the transportation of goods for merchants. They know all about horses; they like animals; their knowledge of the automobile would be great if they knew as much about them as they do about "spavins." This loyalty to the horse is commendable in the extreme. Loyalty is a virtue. When it fades away, or when merchants put automobiles in the hands of the men who will appreciate their needs and the conditions under which they will render the best service, then, and then only, will the records of costs be worth taking into account.

It will occasion no great alarm, even if these conditions do obtain to quite some extent, for two reasons at least. In the first place, if merchants really knew how thoroughly good automobiles are for the purpose of transporting goods they would not use horses at all, and the change would come so suddenly as to discommode the breeders of horses, and the wagon builders, whose investment would be destroyed. In the second place, the requisite number of skilled men in the automobile industry would be difficult, if not impossible, to provide.

The Largest Contributor to the Success of Commercial Motor Vehicles

Diamond

Wire Mesh Base Tires

Results

Exclusively for this work. Whether measured by ton mileage, aggregate economy, or length of time in service, they all spell Economy. No machinery needed to apply.

Diamond

Side Wire Solid Tires

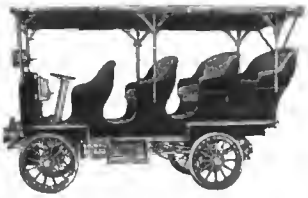
Made Diamond Way Throughout

The side wire feature refers to style and application only. ***Diamond rubber and Diamond know-how deliver the mileage.***

The Diamond Rubber Co.

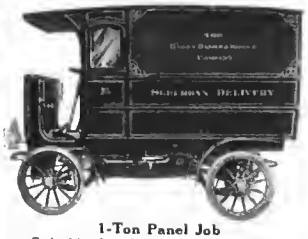
Akron, O.

The Rapid Agency Proposition



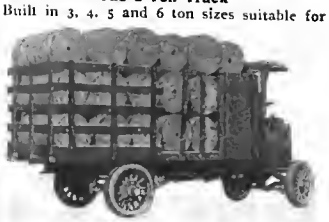
12-Passenger Pullman
For the profitable business of sight-seeing hotel work, summer and winter resort work, etc.

1-Ton Open Job
For all kinds of carting purposes.



1-Ton Panel Job
Suitable for dry goods and general delivery work.

The 5-Ton Truck
Built in 3, 4, 5 and 6 ton sizes suitable for



flour mills, breweries, lumber companies, coal companies and any line of business requiring a heavy-duty power wagon.

HERE is a proposition for the one best man in every city—for the broad-gauge business man or agent—a proposition full of opportunities—one which means more money for the agent during 1909 than ever in the past; namely, *representing* and *selling*

Rapid Commercial Power Wagons

We want agents—hustling business getters—men with financial backing—not chauffeurs or demonstrators—and to the one in each locality who secures the agency for **Rapid Commercial Power Wagons,** we will put behind him one of the greatest selling and advertising campaigns ever put behind any commercial power wagon proposition.

More money, more new plans, more legitimate aids will be given the agent for **Rapid Commercial Power Wagons** than ever before.

Write to-day for our agency proposition.

The Rapid Line for 1909

comprises models ranging from 1,000 pounds up to 6 tons, as follows: **Rapid Commercial Power Wagons** for *any line of business* in ½, 1, 1½, 2, 3, 4, 5 and 6-ton sizes.

Motive power: engines of the two-cylinder opposed 24 to 30-H.-P. type, up to four cylinders, 60-H.-P., vertical, heavy duty motors.

The **Rapid** line for 1909 offers the largest selection of models ever manufactured.

Therefore every user of one or more horses represents a prospective buyer of **Rapid Commercial Power Wagons.**

There are no theories represented in the Nineteen Hundred Nine **Rapid Commercial Power Wagons.** All mechanical and other details have been proved correct by over ten years of actual service in the hands of hundreds of users in oyer fifty different lines of business.

We have spent *over a quarter-million dollars* to bring **Rapid Commercial Power Wagons** up to their present state of perfection and efficiency.

The agent who handles **Rapid Commercial Power Wagons** will have a line that can back him up—a line that has "made good"—one that has met the requirements of commercial motor wagon practice, and needs no apologies.

A word about the **Rapid Motor Vehicle Company:** It is the largest and oldest in the commercial car business—and makes nothing but Rapid Commercial Power Wagons, which are **"BUILT FOR BUSINESS."**

The agent who "ties up" to our organization gets backing which means a great deal, not only in influence, but in protection and fair treatment; a factory which can stand back of its product with a guarantee that means just what it says and a factory which helps its agents in every way possible.

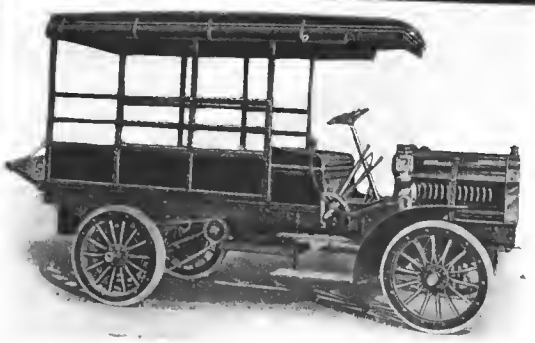
Just to remind you—write to-day.

See us at the New York, Boston and Chicago Shows.

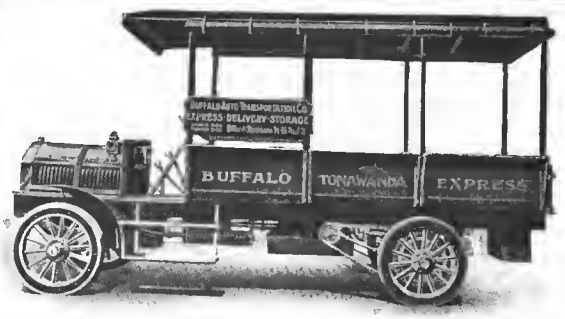
Rapid Motor Vehicle Company

510 Rapid Street, Pontiac, Michigan, U. S. A.

Members American Motor Car Manufacturers' Association.



One-ton, Four-cylinder, 25-h.p. Truck.



Three-ton, Four-cylinder, 40-h.p. Truck.

We Are the Oldest Makers of Commercial Cars in the United States

We have been pioneers in all improvements and design. We have had the experience that must be had in order to build successful commercial cars. The many little kinks in the design and construction of our cars are results of practical operation, a development that overcomes all faults in commercial cars. Our cars have proven themselves; they have been in service for years and have always proved satisfactory.

Now isn't it better to come to us who know and have the **proven goods,** than 'tis to mix up in experiments, that may or may not be right?

We show a few types of our cars here. You will note that there is an element of fine finished design to all of them. While being strong and sturdy, they also carry a pleasing appearance.

In the matter of sight-seeing cars we have built more than any other manufacturers, simply because each last car has been a clean, satisfactory car in efficiency and operation.

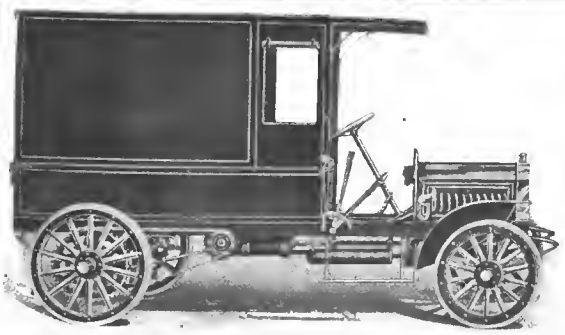
We are making a six-cylinder truck that is pronounced by disinterested people as the finest thing of the kind in the world.

Our hotel Omnibuses have gained especial distinction because of their freedom from repair costs, and their reliable operation under any and all conditions.

We have executed the largest orders for commercial cars in the United States; orders where price was of secondary importance to quality. We have the facilities, we have the men, we have the disposition to make these cars better than any one else, and we are disposed to sell them at a reasonable price.

We shall be pleased to have your inquiries and correspondence. They shall have prompt attention.

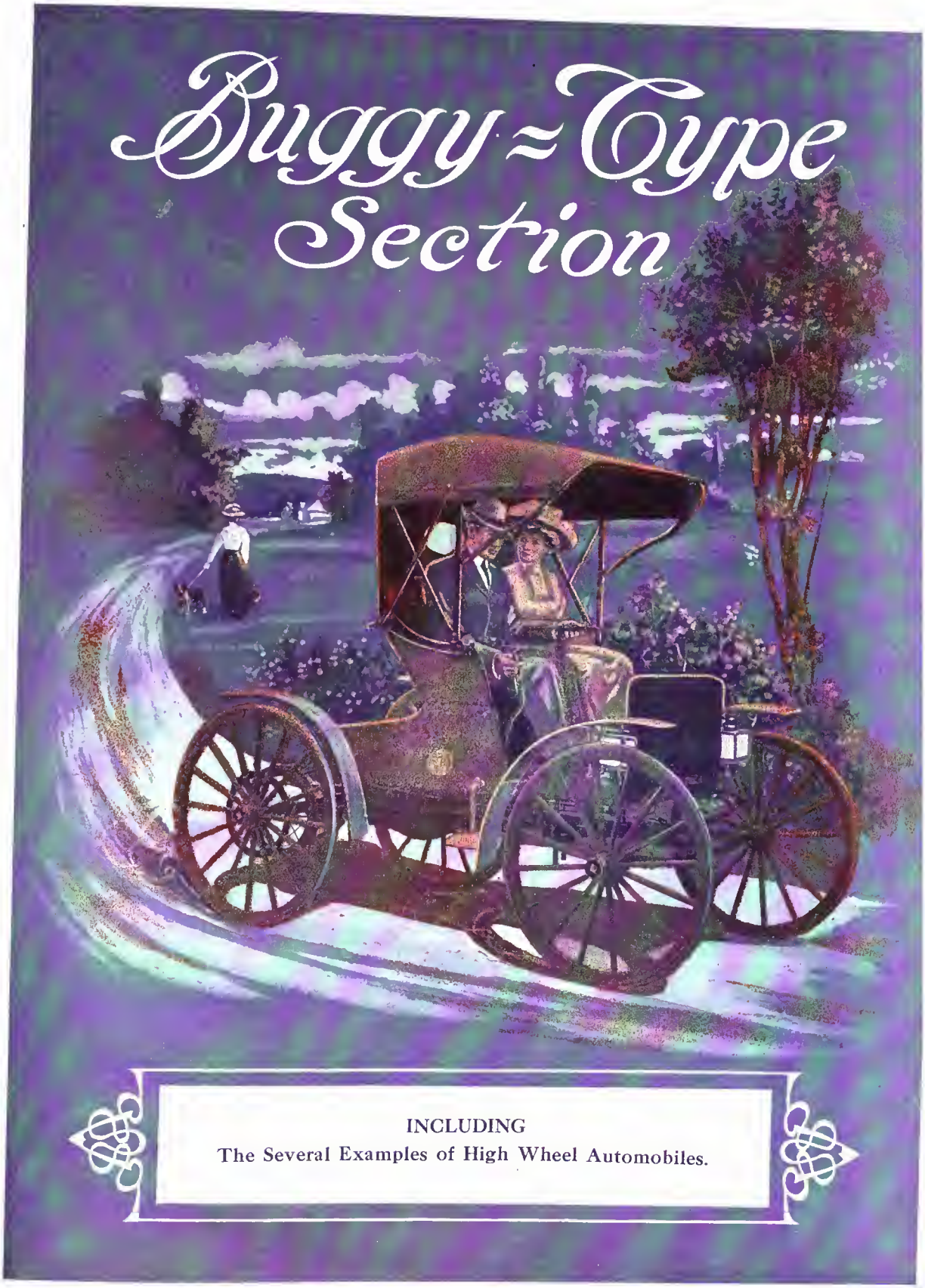
THE AUTO-CAR EQUIPMENT CO., BUFFALO, N. Y.



1,000-lb, Four-cylinder, 20-h.p. Delivery Car.

24-passenger, Four-cylinder, 40-h.p. Sight-seeing Car.

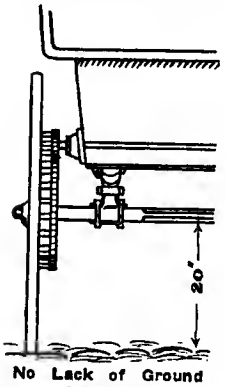
Buggy-Type Section



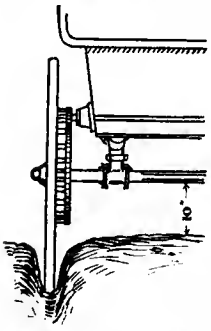
INCLUDING
The Several Examples of High Wheel Automobiles.

High Wheel Types of Automobiles

EARLIER examples of automobiles were, in point of general appearance, close in point of resemblance to animal-drawn vehicles of every kind. In the evolution of the car the pneumatic tires were found to be very desirable (having been tried out in bicycles), but the cost was found to be so very great as to debar the use of pneumatic tires with wheels of such diameter as were found on animal-drawn vehicles. Result: the diameter of the wheels was reduced to a point low enough to bring the cost of pneumatic tires to a commercial basis.



No Lack of Ground Clearance.

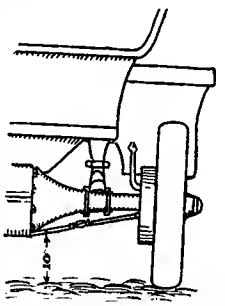


Makes Way in the Mud.

The automobile of to-day, then, is the evolution of the high-wheeler, primarily brought about because of the high cost of pneumatic tires. True, the automobiles were resolved into a distinct machine, involving a low center of gravity, a certain compactness, indicating high speed, great mobility, and all the other factors so well known, among which we must include reasonably good road beds. As the automobile developed along lines requiring good roads it was rendered more apparent every day that there was a legitimate zone of activity involving the high-wheel carriage type of mechanical car. When the high-wheeled vehicle made its re-appearance among the community there were many who regarded it as a mere adaptation of a horse-drawn vehicle for the sake of cheapness, independent of utility to any marked degree. Predictions of this sort were wide of the mark, since the designers of the high-wheeled vehicles had in view the negotiation of impassable roads (from the point of view of the automobile, with a low ground clearance) and they realized that the so-called buggy could make headway under conditions such as would be utterly impossible to any other type of vehicle. The mud roads of the Mississippi bottom developed types of vehicles peculiarly suited to roads in which, if there was a bottom, nothing ever seemed to reach it.

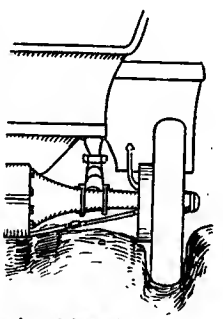
The advocates of the high-wheeled type of car were well experienced in relation to the road conditions, and they kept uppermost in mind the features of construction along lines consistent with the requirements. They could not well improve upon the general features of the conventional buggy, and they were wise in that they did not bow to the clamor of the "pack," who would be most pleased if the automobile were to resemble an "Atlantic" type of locomotive.

While it is true that the high wheel, with a view to increased ground clearance and with a certain symmetry of shape, renders it possible to negotiate bad roads, it is equally true that the long spokes render the wheels pronouncedly resilient, and were we to put this by way of a law, we would say that the desirable properties of the spokes would be proportional to the cube of their lengths. This is equal to saying that a high wheel with long spokes has many, if not all, of the properties of a pneumatic tire. If pneumatic tires are used on wheels of less diameter, it is because the wheels have not the requisite properties, and they must use a pneumatic tire; whereas, with the high-wheel types of cars, the resiliency that resides in the wheels renders it unnecessary, to a large degree, to add further resiliency by way of pneumatic tires.



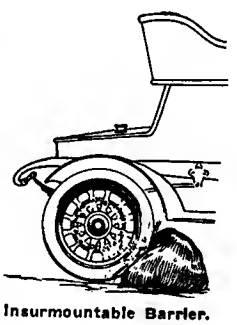
Usual Clearance of a Runabout.

There was a certain definite limit to this reason, but the high-wheel types of cars are confined within that limit, and their utility is by no means reduced to that involving country roads in bad condition. These cars do excellent work on other than bad roads; indeed, it seems almost unnecessary to point out that if they will serve on bad roads, there is nothing to prevent them from excelling if the road conditions are improved. There is a certain economy from the point of view of maintenance in taking advantage of the resiliency of the high wheel to the exclusion of costly pneumatic tires, and it is a fortunate circumstance that the solid tires work better with a limited section than they would on a more extended basis.

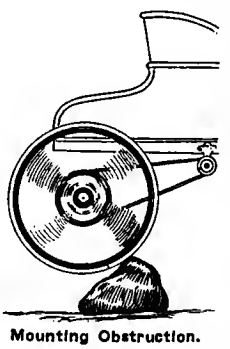


Lacks Adequate Ground Clearance.

Utility is the first consideration, and there is utility in the automobile on good roads, or the high-wheeled mechanical car on the roads not available for the standard types of automobiles. A thing is good if it looks good, and an automobile stuck in the mud does not look good, nor is it good. On the other hand, a high-wheeled type of car wading through that very mud does look good, and it is good. The incentive, then, is there; the car has its utility; it is cheap to build, because there is not so very much of it, and the builders of such cars are in a position to take advantage of the years of experience of the carriage makers.



Insurmountable Barrier.



Mounting Obstruction.

It is not to be supposed that the high-wheeled type of car will lend itself to enormous speed, nor can there be any good reason for wanting to go at racing speeds in cars that are designed to make reasonable headway on country roads. These cars are provided with 18 to 20 horsepower, as a general proposition, so that it cannot be said of them that they are inade-

quately provided with means of locomotion. Instead of being geared for high speed, they are geared to negotiate bad roads, which is a matter of considerable power and a high gear ratio. Even so, the average buggy-about will make 20 miles per hour on good roads, and under pressure it may do considerably better. This speed, in comparison with numerous runahouts of the past, compares very favorably, indeed, and for a doctor (for illustration) it is so much faster than anything possible with horses that the doctor will be justified in taking to the high-wheeler for good and all.

The Question of Tires.

It was pointed out how the automobile of the conventional type came to wheels of a small diameter (a matter of dollars). The high-wheel type of car became possible with the introduction of solid tires (ruhber), the cost of which was not so great as to limit the diameter of the wheels below the diameters customary with carriages. There are one or two points in relation to this phase of the question that will bear discussion, as, for illustration, the tires used on the high-wheeled types of cars are of quite small section, and it is possible that many critics will labor under the impression that this is a matter of dollars, too. But it is not. When solid tires are used they should be of the smallest possible section consistent with the fact that they will flatten out and elongate if the stresses exceed the ability of the rubber to sustain. If, on the other hand, the tires are of liberal section, the rubber will not be sufficiently stressed, and a bouncing effect, most disagreeable in its action, will be the result. When it comes to solid tires, then, the smallest possible section will be the best for use, because the car will stay on the ground, and perform smoothly within the limits bounded by its legitimate sphere of influence. There is just this difference (fundamentally) between the pneumatic tires on the one hand and the solid tides on the other: The pneumatic tires should be as large as possible, and the solid tires should be the reverse.

The Transmission System.

Whatever the difficulties are when it comes to gearing a gasoline motor at a high speed to the rear wheels of an automobile, the latter at a lower speed, these difficulties are much accentuated in connection with the high-wheel type of car, because of the fact that the wheel is of great diameter and one revolution of the wheel means a considerably greater distance on the road than will obtain from one revolution of an automobile wheel, the latter of comparatively small diameter.

In transmitting the power of the motor, involving the high-wheel type of car, devices have been taken advantage of that may not have looked quite so mysterious as are the devices in connection with conventional automobiles. There are, perhaps, a great many people who may have labored under the impression that the transmission devices to be seen on the buggy-about are merely so designed to avoid cost. They can disabuse themselves of the idea, and were they in the position of the designer of the high-wheeled type of car, they would be subject to the same stress of circumstances, and they would have to bow to the same existing conditions. The difficulties are extreme, and the wonder is that the details of the transmission were so nicely worked out in so short a time, and that they worked out so well. While in some isolated instances the details of the transmission are in process of evolution, with strong hopes of evolving means of far more than ordinary merit, the fact remains that the industry on the whole is crystallized, and the patrons who require high-wheeled vehicles were well considered during the process of designing.

Body Work as It Relates to High Wheel Types.

The experience of a century of carriage building is worth something and that the result of this experience still clings to the cars of the subject is to be expected. Naturally there were influences to he considered such as would hring the cars up to date and to the requisite extent allow for the presence of machinery. That the machinery naturally would have to be taken into account is not to be lightly thrust aside, but it was a process that did not result in destroying the fine points in bodymaking as they relate to the buggy type of automobile. In the high-wheel types it is necessary to have strength, but it is also important to eliminate weight. Indeed, if it is important to keep the weight down in automobiles in general, it is of far greater importance to depress the weight in this type.

Experience has taught the builders of this type of cars how to retain strength and at the same time avoid weight, which condition is contrary to the general expectatlon, from the point of view of the design of structures. In general it is the custom to expect weight if great strength is to he a factor. Under these conditions it will he a mistake to assume that the buggy body is used because it is low priced or for any other commercial reason, not taking into account the consideration involving appropriateness as the first requisite. In this service the several types of bodies are used just as in the automobile in general, in which room is afforded for from two to seven passengers, and space is included for the storage of tools or whatnot.

Some General Considerations.

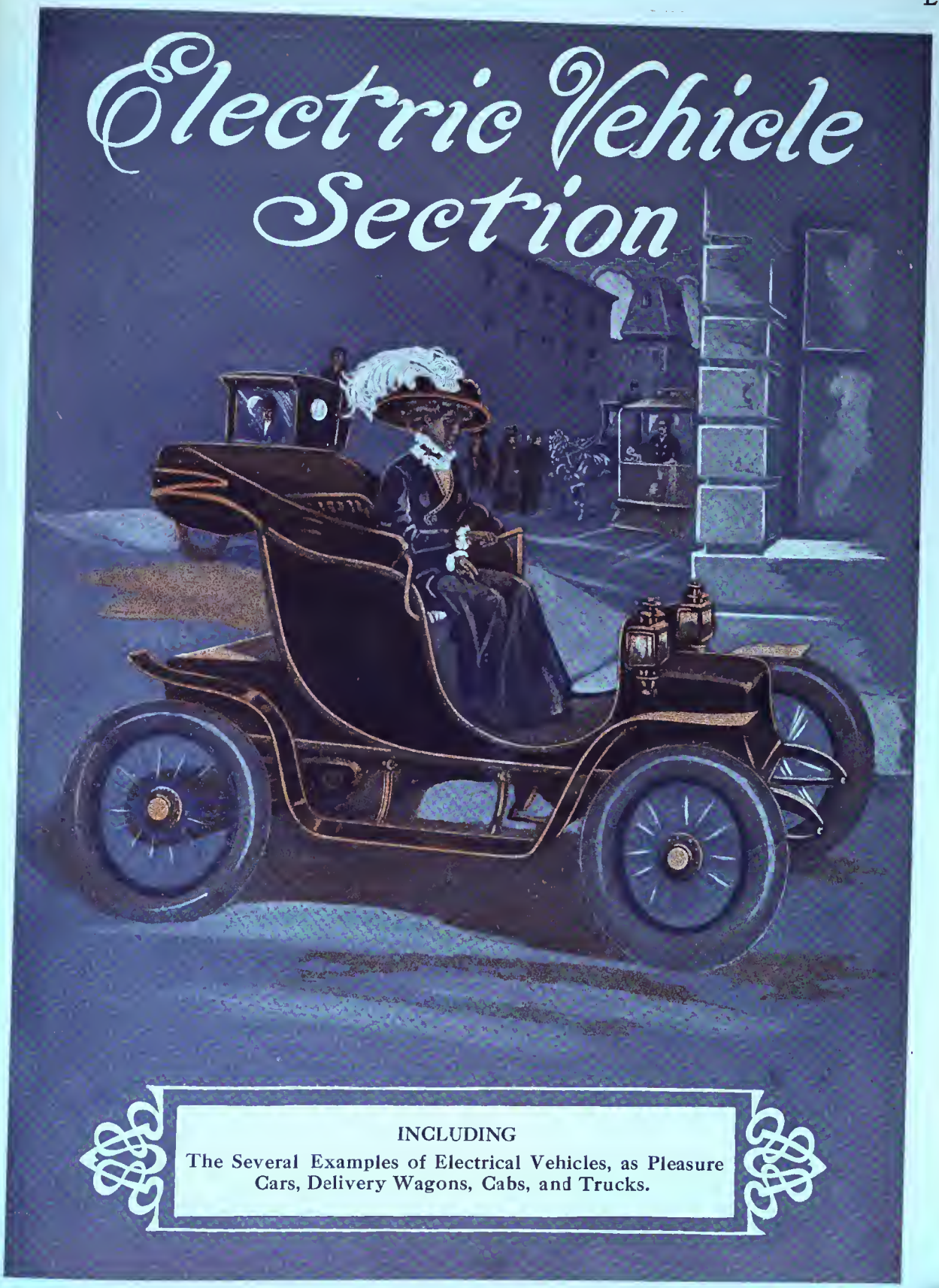
Simplicity in a high-wheel car should be as natural as a duck in a mill pond. This same simplicity augurs for the entire absence of every possihle device for whatever purpose that will not defeat the operation of the car. In this field the air-cooled motor makes it possible to eliminate the radiator, the water pump, and the piping. But if a water-cooled motor is preferred, then the thermo-syphon system of water circulation (the natural water system) renders unnecessary the use of a water circulating pump and such complication as will result from its use. When it comes to the ignition system, it is highly improbahle that a magneto will be necessary, because the motors used are adequate in point of power, without having to squeeze the last drop out of them. It is even possible that an ordinary kick-coil would well serve the purpose, and hy its use do away with the vibrator, which does seem to trouble a great many people with periodic frequency. If the ordinary kick-coil (known in modern and more elegant language as a step-up transformer) will serve on cars of some pretence, costing vastly more than the high-wheel type of cars, it is not too much to say they will prove decidedly advantageous on the cars in which extreme simplicity is worth paying extra for The trend is in the direction of this extreme simplicity and the builders of these cars are staying awake o' nights inventing simplicity instead of complications.

Taking Into Account the Cost of Maintenance.

The first cost of the high-wheel car is low. Interest on the investment is low. Repair parts can be had at low cost. The tire situation is healthy. The utility of the car is assured. These five statements are as a word picture that tells the whole tale to the man who may have had anything to do with the subject at all. It is nothing short of utility that demands just what the high-wheel car affords. It is all very well to own and run a pleasure car of the conventional type under pleasurable conditions, but it is not all right to try to do the work of a buggy type with anything else but a buggy. Cost must be taken into account in the long run, and there are a horde of users of cars at the present time who find in the huggy type the very car they require. This is a fortunate circumstance, in which the low cost of the buggy type, coupled with its naturally low cost of upkeep, are fitting factors.

From the fuel point of view the huggy type has always stood out as all that can possihly he desired by conservative man. In spite of this fact the available power is adequate, in which the power for weight is at least up to general practice. In hill climbing the huggy type has done so well that it surprised the average autoist, who, in his egotistical way, failed to keep abreast of the times. He failed to note, for illustration, that the first automohile in which the motor is arranged to deliver power direct to the rear road wheels is of the very type he was so prone to despise. He failed to take into account the fact that the reason his wheels were not high was because he had not the inclination to pay the price to procure them.

Electric Vehicle Section



INCLUDING

The Several Examples of Electrical Vehicles, as Pleasure Cars, Delivery Wagons, Cabs, and Trucks.

CONCOMITANT with the advances in electrical vehicles were the improvements wrought in storage batteries. The success of the electrical vehicle depends almost exclusively upon the obtainable success of the battery. The question of the chassis was settled in common for the several modes of automobiles. The electrical motors as used in vehicles of this class were refined in connection with street railway and other work. In the early days, before the perfection of the chassis and the details of the electrical system, the problems were more diverse in their characteristics and far more difficult to solve.

The tire problem was more acute in connection with electrical vehicles, because the weight of the battery mounted up to a considerable figure. In some of the carlier types of trucks it was not uncommon to observe a weight of two tons in the battery alone. Gradual advances in battery construction resulted in a very material reduction in the total weight, and this reduction, in view of improvement wrought in tires, resulted in the elimination of what was long termed "impossibilities" in connection with electrical vehicles. True, there remains what is called the tire problem, but it has been reduced to a commercial basis, in that the electrical automobiles do so much and such good work as to earn excellent returns on the investment, besides settling for tires and the remaining costs.

In the early days of the electrical automobile the facilities for charging the batteries were so crude as to be indescribable. A battery follows very well-known, and fixed, chemical laws; it must be manipulated by a man who appreciates the significance of these laws, and every violation of any one of them carries with it a penalty. There was a time when experts in this line worked continuously with the idea of evolving types of battery, less in point of weight on the one hand, and of greater stability on the other. In the long run reliance was placed on the batteries as they are to-day, and when it was found that relief was to come by way of more careful attention to details, rather than through the good office of some revolutionary invention, things looked up a bit and the batteries thrived.

Carrying Capacity of Electrical Vehicles.

As a general proposition an electrical automobile will carry the equal of its own weight. The motor equipment is of such a character as to deliver the requisite torque under the most severe conditions of service. An electrical delivery automobile, then, will make headway on bad roads, up steep grades and in deep snow. They are not vehicles for speed, and while they are relatively slow, they are sure. Because of this reliability, electrical vehicles lend themselves to commercial work, especially to heavy short hauls, and if they are used continuously, as they should be, the batteries will serve best and earn for the owner of the car in every case the price of a new battery, plus a fair return, ere the battery wears out.

Electrical Pleasure Automobiles.

There is nothing that looks more pleasing than a little "piano box" type of electrical runabout, picking its way through busy streets or on boulevards with a lady at the lever. These little cars are perfectly simple to manage; they obtain a speed of from 12 to 18 miles an hour and they rarely ever get out of order if the batteries are managed by persons of fair skill. These cars can be handled by almost any one at all and in connection with other automobiles in a well-equipped private garage they are extremely useful. There are other types of electrical automobiles that are well worth mentioning as, for illustration, town cars as broughams, victorias, landaulets and a type of cabriolet.

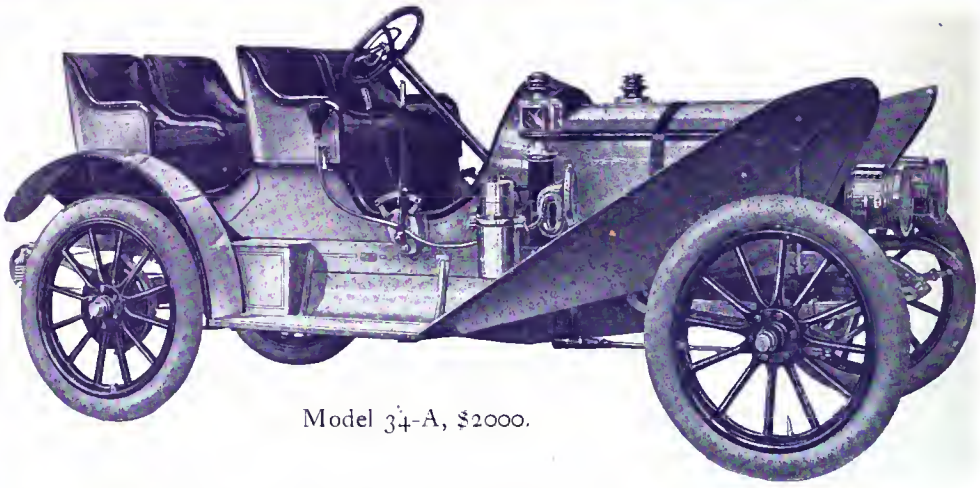
In the Service of a Busy Practitioner.

Medical doctors, in their practice, especially in the winter time, particularly appreciate comfortable and sure means of transportation. The first year that the brougham type of electrical automobile was introduced in the City of New York seventy-two doctors adopted this type of car for use in their service. Some of them complained that the cost was rather high, but none of them made complaint because their radius of travel was increased and their zone of activity brought them better returns. In the long run they tired of complaining, but they stuck to the brougham and, from all accounts, the quality of the service was improved from year to year until to-day it represents much of all there is of sturdy, reliable service and comfort in the extreme without defeating stability.

Wide Range of Uses Outside of Professional Zone.

In private service the electric vehicle may be in divers forms. From the little car with the "piano-box" body to the most luxurious type of town car is a long way, and space forbids a detailed discussion. Moreover, the subject is well threshed out. Even so, it may not be far fetched to say a word or two by way of calling attention to the fact that in various ways consistent with the well-known abilities of the "electric" the service has been on the increase to a very great extent. From early morning to late at night the cars of this class can remain in constant service, beginning with the safe and comfortable delivery of the master of the house to his office in the morning, by which time madam will command the attention of the car for a shopping expedition. In the afternoon the same car will be available for calls or a roll on the "boulevard," unless it is that some special function intervenes. In the opera season the car will be in much demand, in which service it has long riveted the attention of autoists. The time was when the service that a battery would render did not permit of a schedule such as this. That time is past; the batteries now embody the requisite qualities, which was very adequately proven recently, when a car of this class made a touring trip from Colorado to New York, under its own power, over roads such as were long looked upon as entangling propositions for even pretentious touring cars.

Facilities for Charging.—In the early days the question of charging the batteries was so formidable as to retard progress. This phase of the subject made enormous strides until to-day batteries can be charged in garages in every hamlet in the land and in dozens of stations in the large centers. These battery charging stations are beehives of industry.



Model 34-A, $2000.

A BIG RAMBLER YEAR

Dealers who have shared the Rambler success of the past year—a big Rambler year—know of the absolute satisfaction the new Ramblers have given.

No other make at anywhere near Rambler prices approaches the Rambler in quality and exclusive features. The line to be exhibited at the Rambler show, 38-40 W. 62nd St., New York, includes some new models never before shown. These will interest every live dealer in open territory.

Rambler

The Car with the Offset Crank Shaft

Have you seen the Rambler Spare Wheel operated? Call at the Rambler show and we will demonstrate to you how it can be substituted for the regular wheel within three minutes.

During all New York shows Ramblers will be shown and demonstrated at the new Rambler Branch, 38-40 W. 62nd Street, New York. Telephone Columbus 4511; give your address and we will call for you.

Thomas B. Jeffery & Company

Main Office and Factory, Kenosha, Wis.

Utility of the Runabout

WITH the final separation of the runabout from the light touring car, the runabout as a type stands alone, and is limited in its application to just the service it was originally intended to satisfy. This is fortunate for the runabout, because its reputation has sustained severe injury in every case in which the little car has been compelled to "tote" a tonneau.

In a way, the extra service imposed upon the runabout types has augured for advancement in that the wheelbase and other essential dimensions were increased from time to time, in the evolution of the runabout, in the direction of the ligbt touring car. The wheelbase should be more than it was in earlier times, because easy riding qualities do not abound in conjunction with speed and a contracted wheelbase, although it is true for every wheelbase lengths there are limits of speed wherewith the car will perform satisfactorily.

It is not now uncommon to find runabout types of cars with even four-cylinder motors rated at approximately 20-horsepower, while double opposed motors of from 15 to 20-horsepower are common, and the single cylinder motors are designed to be from 10 to 14-horsepower, so that tbe power available in nearly every single instance indicates that the wheelbase should be long. Fortunately, for the patrons of the industry, designers have not been stingy in this direction.

The earlier examples of runabout types of cars were designed with a wheelbase even as low as 60 inches, wbile to-day it is not uncommon to observe cars in which the dimension referred to even exceeds 90 inches. There is all the difference in the world in the performance of a car with a 90-inch wheelbase as against the performance of a car with even 80-inch wheelbase, and when it comes to the performance of a car with a 60-inch wheelbase, the speed is absolutely limited to a point far below that at present attainable.

Relations of Speed, Weight, and Power.

If a car is too light, it will be limited in speed in considering easy riding qualities, because it will not stay on the ground. On the other hand, if a car is too heavy, considering the power of the motor, it will not attain speed. There is a very intimate relation, all things considered, between the power of the motor, the weight of the car, and the obtainable speed. To reflect the entire situation, it will be necessary to call attention to the fact that the attainable speed is a matter involving the diameter of the wheels as well.

The more recent products come very close to perfection in these respects, and designers are alive to the fact that it is useless to add power without affording the conditions essential to the utilization of the same. The same designers learned that it is futile to add weight if the addition is in the vertical plane instead of through the good office of a lengthened wheelbase, and they fully realize that the weight of an automobile should be measured in pounds per foot of lengtb, which is not to deny that fully 60 per cent. of the total weight should be concentrated at the point of contact of the driving wheels.

The Transmission and Means of Control.

It is in the runabout type of car that the planetary gear is in its right element. It is sometimes said of the planetary gear that it is "fool proof." This appelation is not only crude, but it fails to represent the splendid qualities of the planetary type of gear. Among the noteworthy virtues of this type of gear will be recorded its absence of any considerable weight in pounds, the small space it occupies, and the fact that it can be stowed away in a more or less obscure situation, because it is completely housed in and there is no occasion for getting at it while it is in working order, nor would it be an advantage to be able to get at it were it out of order. The planetary type of gear has all the virtues of a chronometer. When it works, which it does for a long time, it requires no attention whatsoever, unless to keep the cavity more or less full of oil, and when it wears out, to replace it is the natural thing to do. This type of gear is much used on the runabouts at the present time, and it is even used on some touring cars, which is an indication of its ability quite in excess of the needs in so far as the runabout type of car is concerned.

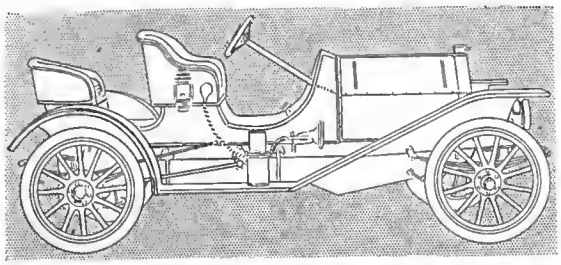
This type of gear gives two speeds and reverse. In the high speed, the gears and pinions remain still, and the whole unit revolves. The gears thus locked are noiseless; equally it is true, they are subjected to no actual wear at all. The cars are light enougb considering the power of the motors, so that it is a very bad road indeed requiring the use of the low gear. The control is so perfectly simple, and so free from any complication, such as would make it possible for the system to get out of order, that it is easy enough to account for the appelation of "fool proof."

The runabouts are not all of the shaft-drive genera, although the shaft drive is more predominate in connection with runabouts than it is with cars of more power. The length of the propeller shaft is invariably a maximum, because the planetary gear is short, and the motor, too, takes up a very little of the available longitudinal distance. Even if sliding gears are used, to which there can be no possible objection (on the ground that they even work in the very largest types of cars), they will not take up a great length in the runabout types, because they do not have to be designed to transmit a large amount of power. It is a matter of expediency, as between the two types of gears, the shaft or the chain drive, the live rear axle or not. Each of the types are represented and merit resides in the cars of the respective methods of construction.

The Utilization of Space.

If the motor is under the bonnet in front, and the front line of the cooler is even with the center of the front axle, which is true in most of the cases, the front edge of the seat comes about 48 inches back of the center line of the axle. Considering the proper depth of the seat and depending upon the wheelbase, the free space back of the seat approximates 30 inches. This space can either be used in connection with a rumble seat, or it affords a very roomy platform or place for a box of light construction for any utility purpose. The rumble seat is much in vogue at the present time. It is positively a great advantage to have one, and if the gasoline tank is located elsewhere, a space under the rumble seat becomes at once available for a tool box.

In the past very little attention was given to the utilization of the available space; in many cases it was even difficult to find a place in which to store such tools and accessories as positively must be taken along with the car. In the best examples of the



Typical Roadster Type That Has Won Popularity.

runabout type of cars to be seen to-day the small details are adequately cared for and the cars of the type under discussion will serve many useful purposes. They become the ideal doctor's rig, increasing the radius of practice, assuring ability to keep appointments, and they perform the service at a cost below that of the horse-drawn carriage.

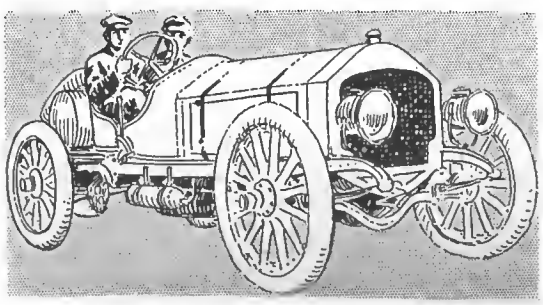
The Fuel Consumption.

The best types of single cylinder runabouts will make from 20 to 30 miles on a gallon of gasoline, and the quantity of lubricating oil required per mile is almost negligible. Increasing the number of cylinders seems to have the effect of increasing the fuel consumption for a given travel, the reason for which lies very largely in the fact that with increasing power the obtainable speed is greater, and reasonable autoists must expect to pay for a little more fuel if they attain a considerable increase in speed. Under certain conditions it is economical to use more gasoline, because with increasing speed more distance can be covered, which is an advantage that can be measured in dollars. When the advantage in dollars considerably exceeds the cost of the increased fuel, it is high time to fix the conditions requiring the increased fuel.

In some of the earlier examples involving the double opposed motor, the fuel consumption was augmented through the imperfection due to the use of a carbureter for each cylinder. This defect, like a great many other minor imperfections, has disappeared, and in the most up-to-date type of these cars as seen to-day a further fuel economy may be anticipated because of improvements in the ignition system.

The Spring Suspension.

The runabout types of cars with the positively short wheelbase were rendered easy riding through the use of "concord" (buckboard) types of springs, but with increasing length of the wheelbase the concord types of springs were abandoned, in view of the difficulties involved resulting in sagging on an unequal basis. It took some little time to design half elliptical and even full elliptical springs, such as would afford a certain suppleness of action without coming down on the axles. Like everything else, it as a problem that has been fairly solved, and the spring action of the runabout types of cars is up to a fairly high standard at the present time. Referring to springs in the "roadster" types of cars, it is to note practices more nearly in accord with the spring suspensions as they obtain in touring car work. As a general rule, the roadsters are of the high power class and the body weighs more than in runabouts; the result is the springs have to be wider, have more leaves (plates) and the length of the springs are greater. When roadsters are merely runabouts with roadster bodies, then, of course, the springs do not undergo change. Probably the greatest advance in relation to springs is in the use of much finer materials for the purpose than any before known, in or out of the automobile zone of activity. The old idea of high carbon steel has been superseded by products in which the carbon content is relatively low.

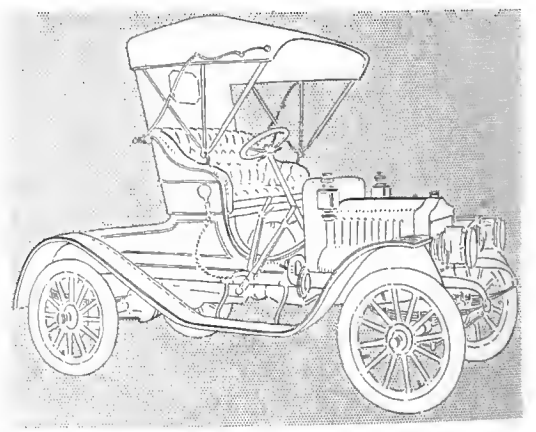


High Powered Type of Roadster—a Fast Goer.

The Body Work.

It is pleasing to note that the bodies of the runabout types of cars are now on a high plane. It finally became a recognized fact that the runabout types of cars filled a niche on a utility basis, and that they were more for utility than they were for pleasure. Under such conditions, the bodies have to stand more washing, the cars are more likely to be out in inclement weather, and the cheaply constructed wooden affair would scarcely serve for any length of time with such arduous work.

The new types of bodies have a certain straight line effect that is positively agreeable in contrast with some of the earlier phantasies, and if they are made of wood they are put together in a definite way, rather to the exclusion of glue and putty. Many of them are made of metal, and on the whole they will stand inclement weather, the washing, and the service. Another point in relation to the finish: the idea of the high carriage finish is a little out of place on a runabout, and a very sensible practice of using a fine grade of paint made of lead with a little zinc and pure oil, colored to suit, is taking the place of an expensive carriage finish, and properly so. The finish on the latter-day cars has the virtue of costing very much less, of looking better in the long run (service considered), and the paint acts as a preservative for the body, preventing the wood from checking and the iron from rusting.



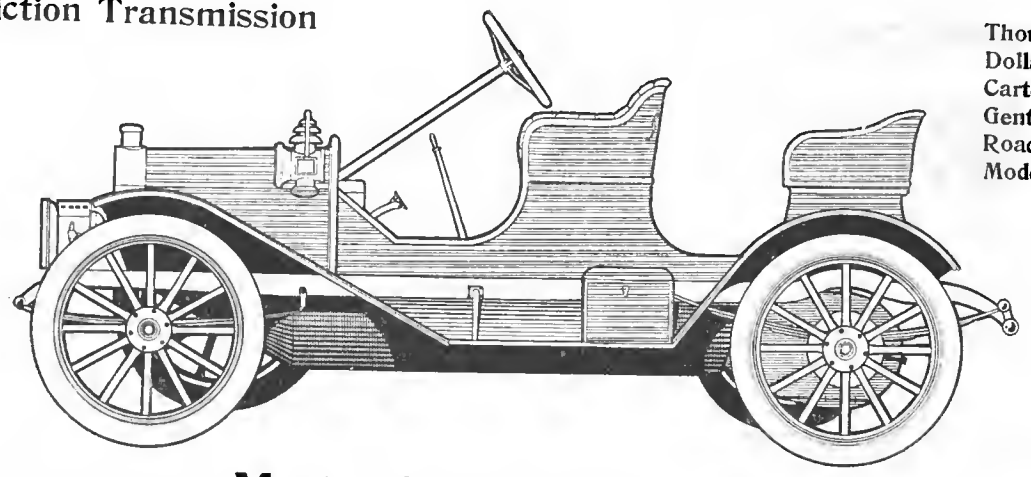
Doctor's Runabout—a Type Popular with Physicians.

The Last Word.

In a hundred ways, the details of the runabout types of cars are on a far higher plane than they were before. A reflection of the trend of the runabout industry would seem to indicate that it will be one of the largest and most important branches of the automobile trade in the not far distant future. These cars are economical to maintain, they are speedy enough, they are a utility proposition in divers ways. No matter how many big automobiles an autoist may have in his garage, he cannot afford to be without a runabout any more than a battleship fleet can afford to be without torpedo boats. The runabout types of cars are, as it were, the "mosquito fleet" of the automobile squadron, and they are just as necessary (because of their nimbleness and utility) as any of the other cars.

Friction Transmission

Thousand Dollar Cartercar Gentlemen's Roadster Model "H"



Become a Motorist Without a Motorist's Troubles

Many have come to believe that "troubles" are a necessary part of motoring—

The thorns that come with roses.

Their experiences have never been different.

The clutch — the geared transmission — the universal joints—the bevel gears—the water pump—all have come in for their share of "trouble."

The Cartercar eliminates troubles by doing away with the troublesome parts with its Friction Transmission.

It is a simple car—so simple, indeed, that there is hardly anything to get out of repair.

It has no clutch to slip—

No gears to strip—

No grease packings to renew—

No water pump to clog—

No noise to annoy—

And only one control lever.

If you have driven other automobiles you will better appreciate what this means.

The Cartercar has a thousand speeds. You can travel from zero up to forty miles per hour.

You can follow a loaded truck on a crowded street without danger of stalling the motor, or speed to your heart's content.

The Cartercar will travel any road any automobile will travel and many that others will not.

It will climb a 50 per cent. grade with a full load.

With our patented aluminum housing the chain runs in a bath of heavy oil, protected from dust and dirt.

It makes it absolutely noiseless, and in connection with our Friction Transmission, is the smoothest running drive yet invented.

The fundamental principles in the Cartercar have always remained the same. Changes have been of a refining and modernizing nature.

It is not an experiment nor the untried product of an overconfident engineer.

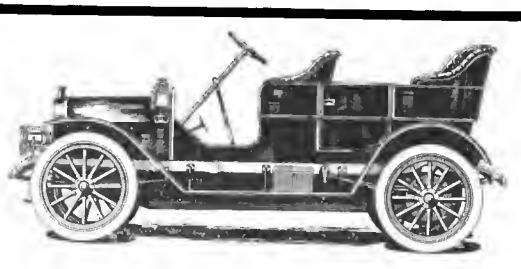
The Cartercar is a high-grade, practical automobile of the finest type.

If you are already an automobiliist—if you are about to become one—Be a Motorist Without a Motorist's Troubles.

Agents who have sold the Cartercar year after year to their nearest friends will tell you about it.

They will tell you of those who have driven over 4,000 miles and have spent only $3.00 for repairs—of 4,500 mile trips without even tire trouble—of 7,000 miles in six months for less than $100.00—and of boys who take all the care of the cars in their father's garage.

Write and we will give you the nearest agent's name and forward literature about our Model "C" Delivery Car, Model "E" folding Tonneau, Model "G" Roadster, Model "H" Thousand-Dollar-Runabout or Model "K" five-passenger Touring Car, Taxicabs, Coupes and Landaulets.



New Model "K" 5 Passenger Touring Car, $1350

It is a beautiful, high grade car with handsome lines conforming with the latest ideas of comfort and class.

A strictly family car for city use or extended touring. It is light in weight, roomy, and the easiest riding car ever produced.

It has our simplified, double-opposed 22-24 horsepower motor.

Carbureter, commutator, etc., easy to reach and adjust.

Lubricator under the hood over motor, avoiding dirt and grease.

Carter patented Friction Transmission, one lever control, noiseless chain drive in dust and oil-tight aluminum housing.

Pressed steel frame of arched pattern giving great spring action.

Long, easy riding springs.

Large, quick detachable tires, 32 x 3½ inches.

A wheel base of 103 inches.

Equipped with three oil lamps, horn, mats, complete set of tools, and tire repair outfit.

Price, $1350, f.o.b. Pontiac.

See us at the Grand Central Palace Show, New York, December 31 to January 7.

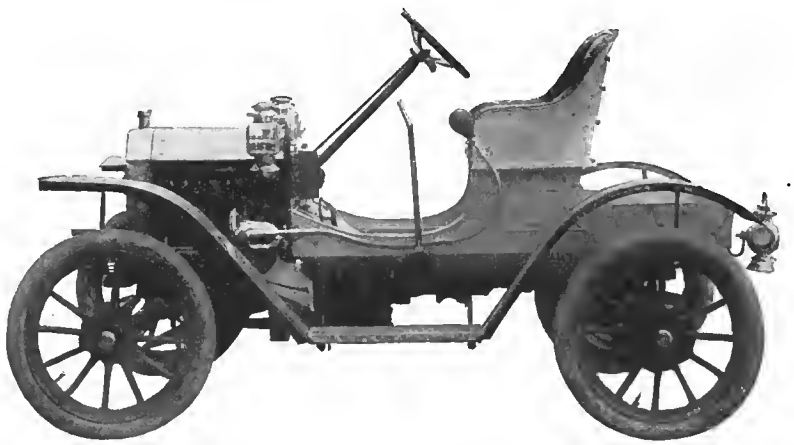
Chicago Automobile Show, February 6 to 13.

Cartercar Company

Pontiac, Mich.

Member A. M. C. M. A.

BRUSH RUNABOUT



Model B
$500
$550

Delivery Wagon
$600

See us at the Palace Show, New York, Dec. 31-Jan. 6

In a certain Michigan town of 1200 inhabitants a live business man took the Brush Runabout agency last August. So far we have shipped him 12 cars and have (at this writing) his order for another carload of 6.

A Western dealer contracted 100 cars for his town for the balance of this Fall and all of next season. Up to December 15 we had shipped him four carloads of 10 each, or 40 cars, with more on order.

Another dealer has taken 60 cars since September.

A small car is a much harder engineering and manufacturing problem than a big car. We have been through the mill. Since the start there have been four years of effort put on the Brush Runabout—one year of experiments, one of designing and testing, one of manufacturing organization and public tryout and one of general use.

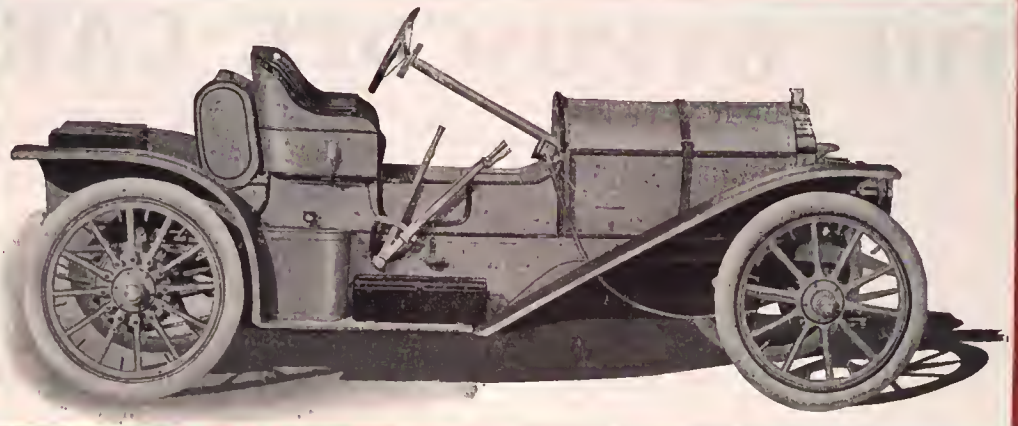
It is no dream or hope. We need no dogs to try it on.

The car is right because people who drive it find it so. The price is not going up nor the quality down, because we KNOW our costs, basing that knowledge on actual past experience in quantity production of THIS CAR. We CAN AFFORD to make every piece in it good. The car sells. Note we don't say "will sell." IT IS SELLING. The profit STICKS TO THE DEALER because he doesn't have to spend it all in free repairs.

Do YOU want territory on it? Some of the most prominent dealers are selling it. It is the BUSINESS MAN we wish to tie up to.

BRUSH RUNABOUT COMPANY, Detroit

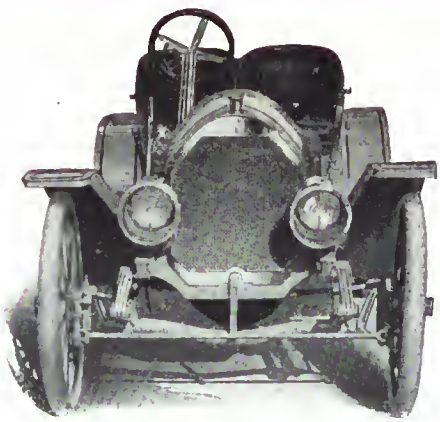
Members A. M. C. M. A.



PETREL

PETREL "6" ROADSTER $2,500.00

Motor—6-cylinder, 4¾x4¾.
Ignition—Double, with U & H Magneto, with self-starting attachment.
Cooling—Water Centrifugal Pump.
Drive—Waite Friction, Double Chain.
Frame—Pressed Steel.
Wheels—Salisbury Artillery.
Tires—36x4.
Gasoline—Tank Capacity, 20 gallons, Gravity Feed.
Upholstery—Plain Imported Patent Leather.
Wheel Base—116".
Standard Color—English Violet with Black and Gold Striping. Piano Finish.
Equipment—Full set Electric Lamps with special 6-80 battery, 50-hour capacity; Horn, Speedometer, Tool Kit, Trunk with two suit cases.
PETREL "6" TOURING CAR—Same specifications with 5-passenger body, no trunk, $2,500.00.



PETREL "4" ROADSTER $1,350.00

Motor—4-cylinder, 4¾x4¾.
Ignition—Battery and coil, Jump Spark.
Drive—Waite Friction, Double Chain.
Frame—Pressed Steel.
Wheels—Salisbury Artillery.
Tires—32x3½.
Gasoline—Tank Capacity, 20 gallons, Gravity Feed.
Upholstery—Plain Imported Patent Leather.
Wheel Base—106".
Standard Color—English Violet, with Black and Gold Striping.
Equipment—Full set Lamps, Horn, Trunk with two suit cases.
"PETREL 4" TOURING CAR—Same specifications, with 5-passenger body, 115" wheel base. No trunk, $1,500.00.

"Petrels" are Silent, Sure, Swift. Get There. Look and Sound Well While They Do It.

PETREL MOTOR CAR CO., Kenosha, Wis.

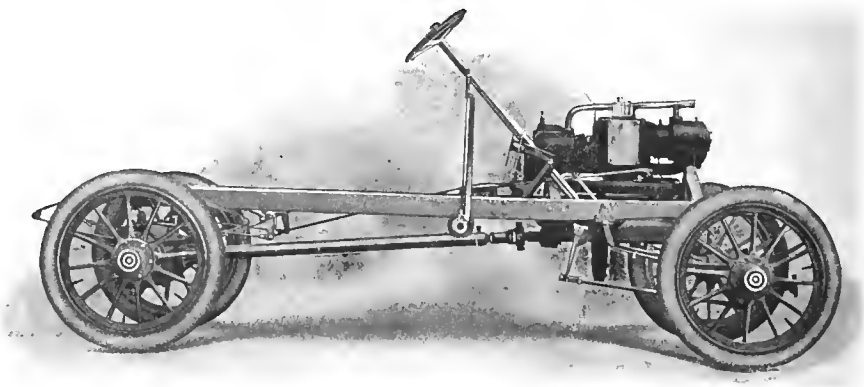
THE GYROSCOPE CAR

The Simplest Automobile in the World

After the initial cost of a car, the possibility of extending and repeating sales depends most on the upkeep.

The Gyroscope Car Has the Lowest Cost of Upkeep of Any Car on the Market

AN IDEAL CAR FOR PHYSICIANS



THE GYROSCOPE CAR HAS

No Clutch. No Change Speed Gear. No Crank. Starts from the Seat. Horizontal Fly Wheel, giving Gyroscopic Stability in Running. No Skidding. Takes Turns at Any Speed. Friction Drive. Absolute Control. 16 H. P. 35 Miles per Hour.

Runabout, $750. Tourabout, $800. Touring Car, $850. Taxicab, $1250.

GYROSCOPE AUTOMOBILE COMPANY (Inc.)

GENERAL SELLING AGENTS AND DISTRIBUTORS

GYROSCOPE BUILDING

231 West 54th Street, New York City

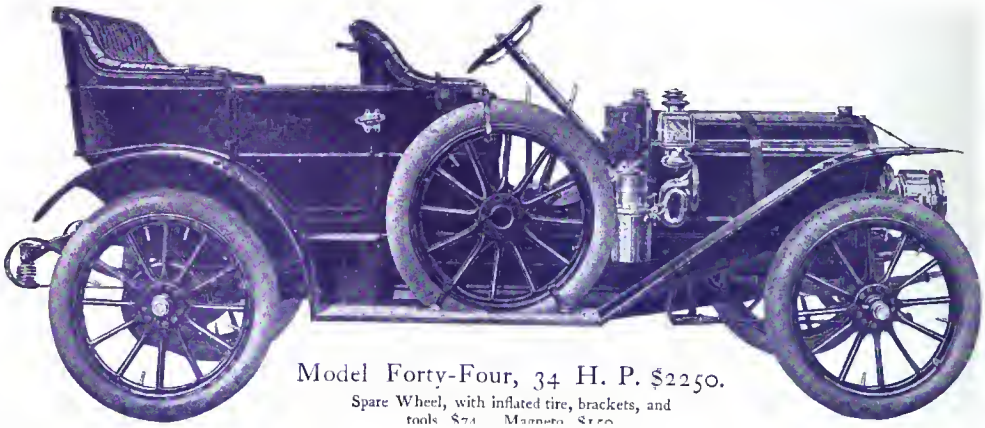
Address A. L. KULL, Gen. Mgr. Telephone, Columbus 4954-4955

☞ *We will exhibit at the A. M. C. M. A. Show, Grand Central Palace, December 31 to January 7*

Touring Car Section

INCLUDING

Light and Standard Designs, in Shaft and Side-Chain Drives.



Model Forty-Four, 34 H. P. $2250.

Spare Wheel, with inflated tire, brackets, and tools, $74. Magneto, $150.

Some Features of Touring Cars.

FORMERLY it was taken for granted that an automobile seating more than two passengers constituted the essentials of a touring car. No attention was paid to the question of the power plant, the strength of the *chassis*, or the accommodations for passengers beyond the seating capacity. It was not uncommon to note a single-cylinder motor mounted in a light frame, on wheels of small diameter, with a body for five passengers weighing more than all the rest of the car combined.

The present trend of the industry is in the direction of the harmonious relation of the *chassis*, power plant, and the line of markation between strictly runabout types and touring cars The runabout types are highly developed, specialized cars, serving definite ends, and are of sufficient importance to entitle them to a separate discussion.

Light Touring Cars.

Instead of overburdened runabouts, we have to-day light touring cars, differing from the standard touring products only in that they are equipped with motors less powerful and fitted out with bodies to seat five passengers. The light touring cars of the present time are more commodious by far than the imported creations of two or three years ago, masquerading as touring cars and all the rage. These light touring cars, in some cases, have a wheelbase of 110 inches, seat five passengers comfortably, and are superior in every way to anything by way of a touring car of two or three years ago. The relation of the ability of the power plant to the total weight is nicely adjusted in that the motors are of the four-cylinder conventional types rated at from 20 to 30 horsepower, as a rule. The total weight of these cars is well within a gross ton, in the most severe examples, and with increasing weight it is customary to increase the power of the motor, holding in nearly every case to the ratio represented by at least one horsepower to one hundred pounds of total weight. These same light touring cars are provided with wheels of more liberal diameter than were wheels heretofore, and it will not be out of place to state that increasing the diameter of the wheels within certain limits is equal to increasing the power of the motor.

While it is true that the shaft drive is very predominate in light touring cars as they obtain to-day, this is not to be construed as indicating any stricture on the side-chain ability, since in all truth, both methods are well represented in the cars of the subject and both methods are competent. In the cases involving the side-chain drive it is not necessary to take into account the angularity, and a point to be made here is that in the shaft-drive cars of the present time the propeller shaft is long and the angularity of the drive is substantially zero under normal conditions of operation.

The universal joint is in every case protected from dust, and in nearly every case provision is made for lubrication, so that the old strictures in relation to this phase of the type of touring car in question have lost their potency. The machinery in all its details is open to inspection, and arranged in such a way as to afford ready access in case of the need of road repairs. This phase of the situation is pleasantly unusual, because there was a time in connection with the light car when to get at any of the adjustments was extremely difficult, if not impossible.

The light touring car has taken on the dignity of an individuality all its own; it bears no relation to its old prototype, and is in no sense a runabout, but, broadly speaking, it is a five-passenger touring car of standard characteristics, differing in no wise from the more pretentious touring cars, excepting that it is lighter, has less need of power, hence a smaller motor, and is geared to speed at about two-thirds of the speed of the larger types of touring cars.

Standard Touring Cars.

If the new crop of light touring cars may be regarded as roomy five-passenger cars, weighing less than a gross ton in almost every case, and equipped with motors capable of delivering at least a horsepower per 100 pounds, the standard touring car differs in degrees.

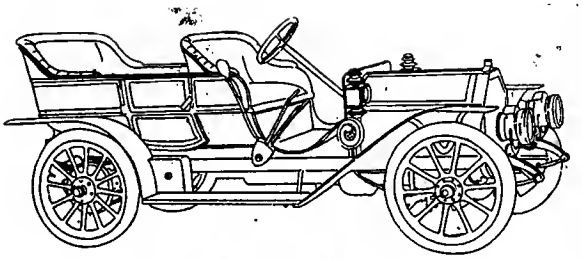
In the standard touring cars seven-passenger bodies of the most roomy description are afforded. The motors are four or six-cylinder types, and the power is on an increased basis, not only because the weights of the cars are greater, but in order to afford a greater ratio of power per hundred weight than the power available in the light touring cars. Obviously, then, the big cars (so-called) go faster, carry seven passengers instead of five, negotiate more difficult roads, because they have more power, wheels of greater diameter, and other parts to match.

In the standard touring cars, the price being considerably higher, there are essential differences which cannot be seen on the surface. Since the motors deliver more power, and since the resistance is greater at every point, the materials must be either initially of greater ability, or the heat treatment to which they may be subjected must be more nearly in accord with the arduousness of the service such cars would necessarily be expected to thrive in.

It is perfectly apparent that to increase the size and the weight of the car, and to increase the motor as respects its horsepower ability in mere direct proportion, would result in a heavier car with a falling off in the speed because the increased weight would sink the tires deeper into the road bed and the road resistance would demand more power for a given speed.

Wheels of Greater Diameter.

Prior to the introduction of the drop frame there was an attempt to placate the ideas of patrons who were quick to see the advantages of a low center of gravity. This attempt took shape by way of a reduction in the diameters of the tires used (diameter of the wheels). The cars looked low, but the center of gravity was about the same as it would have been were the wheels



Characteristic Chain Drive Standard Touring Car.

of greater diameter, all other things remaining constant.

In the modern touring cars the drop-frame idea has rendered it feasible to use wheels of suitable diameter without having to use deception with a view to making the center of gravity look lower than it really is. The standard touring cars of the present time, then, are comparatively low in this respect, notwithstanding the fact that they are more commodious than were cars at any previous time.

The Length of the Wheelbase.

For the standard touring cars in which the motors are of great power, hence of some length, in which a seven-passenger body takes the place of five, the wheelbase distance is, naturally, considerably more than would obtain with the light touring car. In the standard car, then, the wheelbase distance ranges between 110 and 140 inches. The lower dimension would scarcely accommodate more than a five-passenger space, whereas the higher dimensions given take into account seven passengers.

Systems of Control.

If brakes and other means of control are important in cars in general, they are of the utmost importance in touring cars. Touring cars have a wide radius of action, must negotiate country roads of indifferent or even bad construction, and frequently the roads are passed over in the night time under conditions of fog or rain. It is plain to be seen that the brakes must be easy to manipulate and positive in their action. It is equally plain that the new cars more nearly satisfy the exacting demands than they have been satisfied before. The brakes are with larger drums, wider faces, more nearly indestructible linings, and lever systems, laid out to actually accomplish the task imposed upon them.

In the past it was not uncommon to have the speed-changing levers stick on small provocation. This matter has been afforded painstaking care in pretty much all of the line of cars to be seen to-day, probably because all designers realize the necessity of smooth action in speed-changing levers. It is not now possible to find a car in which two separate speed-changing gears could be meshed simultaneously. Fortunately, there never were many cars so imperfect in point of design as to include this defect. One more point, close enough to this phase of the subject to warrant mention, lies in the care with which designers of the present cars have prevented the accidental meshing of the reverse pinion under a misapprehension that a forward speed was being engaged. True, the reverse pinion would refuse its mate, excepting at coincident speeds, or nearly so. A wrecked transmission gear-set is pretty nearly sure to follow the accidental engagement of the reverse gear when the car is driving ahead at even a fairly low speed. Again, in the old days, to motor in costumes of any value was to depreciate the value of the costumes, if grease, grime, or oil would accomplish such destruction. As it is now, the oiling is done by a suitable force-feed oil pump, remote from the space reserved for the occupants of the cars. Under such conditions it is possible to keep the seats, decks and entrances clean.

Some Potential Factors for Safety.

Standard touring cars are essentially capable of speeding; and to speed with safety is a matter of first importance. The modern production requires greater measures for safety because of the greater power of motors used and the increased efficiency of the transmission, thus ending in a greater maximum speed, with a given weight of car and a given expenditure for gasoline. The effect on the parts of a motor is greater for speed than it is for weight (tires excepted). Since cars are lighter to-day than they were before, better materials and superior designs are necessary to insure safety. To assure safety, the vitals of the new cars are properly nested behind less essential heavy parts. The steering linkages, for illustration, will be found above and to the rear of the axles, or in equally protected locations. This is in considerable contrast with some of the cars of ancient vintage in which the steering (drag rod) was the lowest down, and the parts which, if they intercepted an obstruction, would result in the greatest damage.

Designers have taken advantage of experience, and while they have evolved cars with a greater ground clearance, they have at the same time lowered the center of gravity. This means that the parts are closely nested and situated at a near approach to the ground clearance line. This is true in almost every case, whereas a year or two ago there were (only) possible exceptions in favor of a high clearance and a low center of gravity.

Features Indicating Increased Comfort.

The standard touring cars, besides affording luxurious space, are upholstered in a manner befitting the service to be rendered. The cars are heavy enough to maintain a level platform, in view of the improvements wrought in spring suspensions; with such a balance of the relation of the weight of the bodies to the weight of the passengers that the absence of one or more passengers will not seriously affect the easy riding qualities, once a pronounced disadvantage in automobiles.

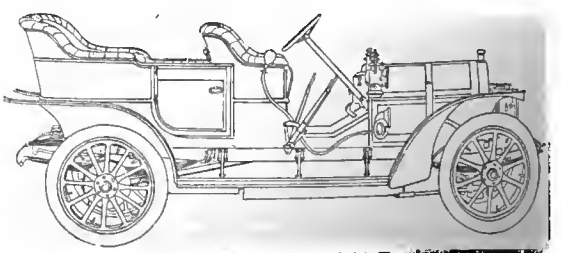
The various noises previously regarded as the most serious drawbacks to cars in touring service are now conspicuous for their absence, not alone as respects the exhaust, but in connection with the linkages and other parts.

Some Special Features.

In touring the question of what to do with the chauffeur, were the owner to drive his own car, as most owners would like to do from time to time, has been very definitely settled by what is now known as the close-couple body. This provides a seat over the rear axle for the chauffeur at all times when he is not actually at the wheel. In his comfortable berth to the rear of the body proper he can neither be seen, nor can he hear what the occupants of the car may be talking about.

The close-couple body brings the side entrance so far in front of the rear wheel as to permit the use of a very wide opening. The shaft drive, if considered in this connection, disposes of the sprocket-wheel housing that always did seem to be in the way. Up to very recently the shaft drive was not regarded as sufficiently rugged to withstand the severe usages incidental to touring. This year's cars would seem to indicate that the shaft drive is not limited by any such considerations at all.

There are numerous other examples in which the side-entrance is quite up to the requirements from the best point of view. Looking at the whole question from any angle, it is to observe a very decided display of ingenuity, the purport of which is to afford to the patrons of the industry the conveniences they express a preference for without in any way defeating the ends from the point of view of necessity, allowing that the design demands cannot well be compromised, even to afford comfort.



Characteristic Shaft Drive Light Touring Car.

The 1909 ROYAL TOURIST

Speedier, longer, roomier, stronger, easier riding and more readily accessible, the Model "M" is without doubt the most permanent car in every particular that has yet been presented to the motor world.

The Model "M"

NEW FEATURES

MOTOR

Chief of the new improvements is the motor, with a larger bore and stroke, the new dimensions being 5½ inches by 6 inches, giving greatly increased power and a range of from 5 miles to 65 miles on high gear. The enlarged motor demonstrates the acme of excellence to be obtained in smooth running and reliability.

CARBURETER

An improved carbureter, actually unique as a fuel saver, *insures* positive service with the minimum of effort and expense.

IGNITION

The improved and independent double ignition system is greatly simplified, does away with much wiring, and is a distinct advance over any system heretofore devised.

LUBRICATION

Two separate force feed oiling devices of increased capacity and efficiency are incorporated.

TRANSMISSION

The selective type of transmission, giving four forward speeds and one reverse, is employed.

BRAKES

Five distinct brakes give perfect security to the Royal Tourist user.

AXELS

The front axle is of I-beam construction and the rear is of the readily demountable floating type.

WHEEL-BASE AND TONNEAU

A considerably lengthened wheel base—the new model being 126 inches—an extra roomy tonneau, accommodating six persons, and luxurious appointments throughout, are features of the Model "M" which will commend themselves to the discriminating.

ACCESSIBILITY

Every innovation, every change and every improvement has been so made as to render it possible to easily remove any part without disarranging any other part.

Nothing has been omitted and everything has been done to make the new Royal Tourist the most dependable car on the American market for years to come.

The Royal Tourist Car Company, Cleveland, Ohio

THE TEST OF SERVICE IS ALL WE DEMAND MEMBERS OF A. L. A. M.

CHADWICK STOCK RUNABOUT, STRIPPED FOR RACING

New Models, to be known as the

"PERFECTED" GREAT CHADWICK SIXES

will be shown for the first time

at the

Grand Central Palace Show, New York

We have abandoned yearly models and standardize The "Perfected Car" which will be exhibited in Touring Car, Tourabout, Runabout and Chasais.

The above illustration is of the victorious test car.

This car made its initial appearance in the Wilkes-Barre Hill-Climb, May 30th, 1908, at which time it shattered all records. Since that time it has won all the big hill-climbs of 1908 in which it was entered, and would easily have won the Vanderbilt Cup Race had it not been for a crippled magneto in the seventh lap. Thus we have tried and tested the new perfected models, exact duplicates of which with the various bodies are being initally exhibited.

IMPROVEMENTS

Note the following improvements in the "Perfected" **Great Chadwick Sixes** initially exhibited at Grand Central palace, New York

WHEEL BASE—Seven-passenger Touring Car and Tourabout, 130"; Racing Runabout type, 112".

BRAKES—Four very large and improved brakes, equipped with air-cooled shoes 1¼" in thickness, instantly adjustable.

CLUTCH—Improved internal expanding type. The band can be entirely removed for inspection in 30 seconds.

DRIVE—The only ABSOLUTELY SILENT chain drive in existence—sprockets and chrome nickel steel chains are so constructed and contained in oil-tight cases that chain noise is completely eliminated in the new model.

MAGNETO—Improved Bosch high tension, equipped with perfected advance device, which insures easy starting on quarter turn without use of the battery system.

HORSE-POWER—An absolute increase of 35 per cent in power; this great increase is obtained by refinements and improvements, while the bore of 5" and stroke of 6" remains the same as in 1908 model.

LUBRICATOR—Improved; the flexible sheft hes been replaced with a direct shaft drive.

COOLING—A most efficient type of Honey-Comb Radiator is used in place of the celluiar type.

TIMING—Hardened chrome nickel-steel time gears, cam shaft and cams accurately ground by special grinding machines, valve lifts readily adjustable.

SPRINGS—Exhaustive tests of the improved suspension have demonstrated greatly increased resiliency and stability.

STEERING GEAR—New Chadwick system of gear, instantly adjustable with large heavy steering post and 19" wheel. The new steering device is made of chrome nickel eteel throughout. The band sectors on wheel controlling the gas and spark are of a new and perfected type.

CONTROL—The gear shift lever, segment and locking device are much heavier and the design is improved. The emergency brake lever is also heavier while clutch, foot brake and foot accelerator are all adjustable for position and refined in appearance.

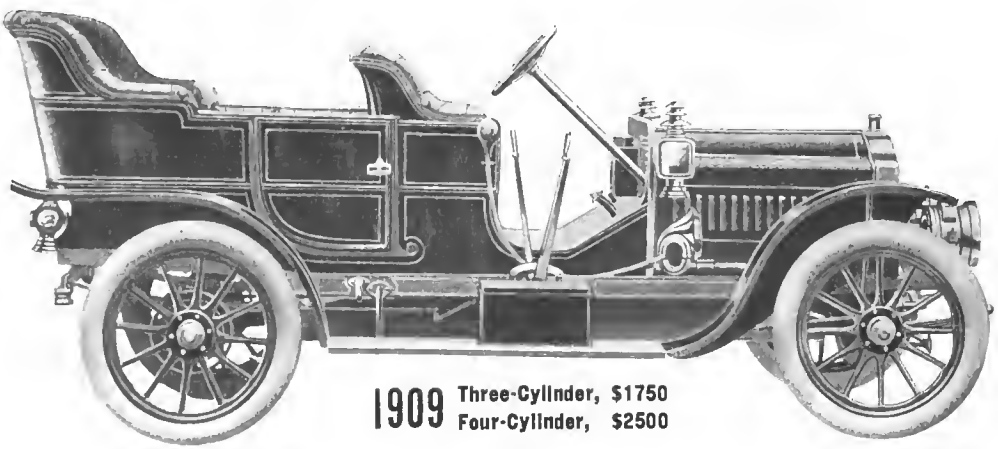
BODIES—The bodies are much larger, while the workmanship and material are the very best that careful attention and unrestricted expenditure can obtain.

Apply for literature and address communications to Department S

CHADWICK ENGINEERING WORKS

POTTSTOWN, PA., U. S. A.

Your Purchase of Any Four-Cycle Car Is Your Perpetual, Unbreakable Contract with Troubles—Troubles Entirely Unknown to the Elmore Owner



1909 Three-Cylinder, $1750
Four-Cylinder, $2500

Right now you are most likely considering the purchase of some four-cycle car.

The question that vexes most is whether it shall be one with a four-cylinder or a six-cylinder engine.

But that which seems so important to you shrivels to insignificance before the greater question of four-cycle or two-cycle.

For on the latter—**entirely** on the latter—depends your future satisfaction with the car you buy.

Yes, the very life of the car itself is prematurely shortened, or prolonged, by the principle of its motor—four-cycle or two-cycle.

If you understood the Elmore valveless two-cycle car, there could be no question in your mind. Your decision in favor of the Elmore would be a foregone conclusion.

You would know why the Elmore runs and runs and runs, with never a bit of unnecessary trouble or exasperation or expense—just as every present Elmore owner knows.

You would realize what you don't know now—how all-powerful is the influence of valves.

The Elmore engine has no valves; it produces the smooth, constant rythm of power known as continuous torque—something that no four-cycle engine, no matter how many cylinders it has, can do.

These differences are comprehensively explained in the 1909 literature. Get it and study it until you are perfectly familiar with the Elmore valveless two-cycle engine.

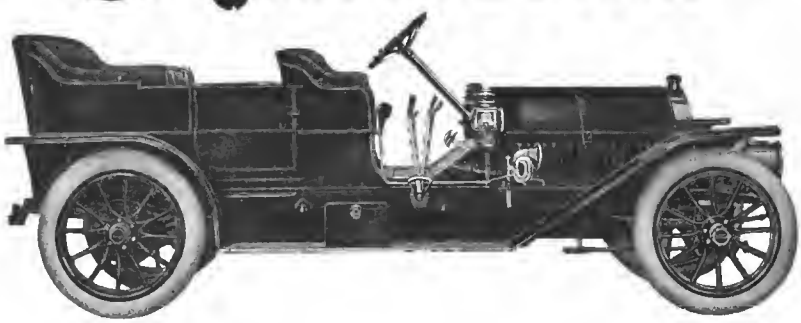
Then seek the Elmore dealer and a demonstration of the car. The dealer has been allotted as many cars as he can obtain, so you realize the necessity of deciding without delay.

THE ELMORE MFG. CO., 1304 Amanda Street, Clyde, O.

Member Association of Licensed Automobile Manufacturers

THE ELMORE WILL BE EXHIBITED ONLY AT THE MADISON SQUARE GARDEN SHOW, NEW YORK, JANUARY 16-23. STUDY IT THERE.

National



Just as Faultless as It Looks

The following specifications should appeal to those experienced motorists who appreciate a car of irreproachable character

MODEL 9-35

Mntor—Four cylinder, 4½ x 4½ inches vertical, cast in pairs, mounted on main frame. Mechanical valves, exhaust and admissioa on opposite sides aad interchangeable. Ball-bearing crank shaft and ball-bearing cam shafts. Tapered nipples used on intake, exhaust and water pipes in place of packing. Extra long Parsons white bronze bearings on connecting rods. Gear driven distributor. Divided aluminum crank case. Iaterchangeable parts.

Clutcn — Self - contained alumiaum cone, leather faced, spring cashioned.

Transmission—Sliding gear selective type. Three speeds forward and one reverse, direct on high. Self-contained annular type ball-bearings on main and counter shafts. Gears run in oil.

Wheel Base—115 inches.

Drive—Bevel gears through ball-bearing propeller shaft and flexible joint to rear axle of improved design.

Beabings—Annular type ball-bearings throughout.

Wnebls—Wood, artillery pattern, ten 1½-iach spokes front and twelve rear.

Oilinn—Crank case, coastant level fnree fecd oiler. Oiling all working parts of motor.

Ignition—Two separate, complete systems. One a gear-drivenhigh-tension. Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs.

Gasoline Capacity—15 gallons.

Tires—34 x 4. Diamond, G. & J. or Michelin.

Brakes—Two systems. Two internal expaading metal to metal hub brakes and two band brakes on outside of rear wheel drums. Hand lever applies one set. Poot push pedal applies the second set.

Frame—Pressed steel 4½-iach channel sectioa firmly riveted and braced and curved up over rear axle. No sub-frame.

Paont Axle—I-beam, steel forging

Raaa Axle.—Compound construction. Inner axle used only as a driver Wnecls turn upon double annular type ball-bearings on hollow axle which carries all weight.

Finish—Coach carmine or national red; black stripes.

Booy—Straight liae sheet metal, side entrances. Divided front seats. Carrying capacity, 5 passengers.

Steraing System—Eighteen-inch hand wheel, inclined post. Worm and gear, non-reversible chuck. Ball joint connections to steering knuckle.

Contanl—Single lever at driver's right controls all speeds. Three forward and one reverse.

Springs—Hslf-elliptic; 40-inch front, under frame; 48-inch rear, outs de of frame; 37-iach cross on rear.

Equipment—Two 8-inch Rushmore searchlights with generator; side and tail lsmps. Storm aprons, horn and tools.

Paice—$2,750.00, F. O. B. Indianapolis.

MODEL 9-40

Mntoa—Four cylinder, 5 x 5 inches vertical. iadividually mounted on sub-frame. Mechanical valves, exhaust and admissioa on opposite sides and interchangeable. Ball-bearing crank shaft and ball-bearing cam shafts. Tapered nipples used on intake, exhaust and water pipes in place of packing. Extra long Parsons white bronze bearings on connectiag rods. Gear-driven distributor. Divided aluminum crank case. Interchangeable parts.

Clutch.— Self - contained, aluminum cone, leather faced, spring cashioned.

Transmission—Sliding gear selective type. Three speeds forward and one reverse, direct on high. Self-contained aanular type D. W. F. ball bearings on main and counter shafts. Geara run in oil.

Wneel Base—125 inches.

Daive—Bevel gear through ball-bearing propeller shaft and flexible joint in rear axle of improved design.

Beaaings—Annular type D. W. P. ball bearings throughout.

Wneels—Wood, artillery pattern, twelve1¼ iach spokes front aad rear.

Oiling—Cnak case, constant level force-feed oiler. Oiling all working parts of motor.

Ignitinn—Two separate, complete systems. One gear-driven, high-tension Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs.

Gasoline Capacity—17 gallons.

Tires—36 x 4½. Diamond, G. & J. or Michelin.

Baakes—Two systems. Pour dust-proof iaternal expanding metal to metal hub brakes. Hand lever applies one set. Foot push pedal applies the second set.

Faame—Pressed steel 4½-inch chanael section—with sub-frame—firmly riveted and braced and curved up over rear axle.

Paont Axle—Seamless, cold drawn steel tubing, heavy gauged, forged yokes, or I-beam steel forging.

Rear Axle—Compound construction. Inner axle used only as a driver. Wheels turn upon double annular type D. W. F. ball bearings on hollow axle which carries all weight.

Finisn—Coach carmine or national red; black stripes.

Cntanl—Single lever at driver's right controls all speeds. Three forward and one reverse.

Spaings—Half elliptic; 40-inch front, under frame; 50-inch rear, outslde of frame; 39-inch cross on rear.

Equipment — Two 9-inch Rushmore searehlights with generator: side and tail lamps. Storm aprons, horn and tools.

Price—$3,700.00, F. O. B. Indianapolis.

MODEL 9-50

Mntoa—Six cylinder, 4½ x 4½ inches vertical, in pairs, mounted nn sub-frame. Mechanical valves, exhaust and admission on opposite sides and interchangeable. Ball-bearing crank shaft and ball-bearing cam shafts, Tapered nipples used on intake, exhaust and water pipes in place of packing Extra long Parsons white bronze bearings on connecting rods. Gear-driven distrlbutor. Divided aluminum crank case. Iaterchangeable parts.

Clutcn— Self - contained, aluminum cone, leather faced, spring cushioned.

Transmissinn—Sliding gear selective type. Three speeds forward and one reverse, direct on high. Self-contained annular type D. W. F. ball bearings on main and counter shafts. Gears run in oil.

Wneel Base—130 inches.

Daive—Bevel gear through ball-bearing propeller shaft and flexible joint to rear axle of improved design.

Ignitinn—Two separate, complete systems One a gear-driven high-tension Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs.

Oiling—Crank case, constant level force-feed oiler, oiling all working parts of motor.

Gasoline Capacity—17 galloas.

Wneels—Wood, artillery pattern twelve 1¼-iach spokes front and rear

Tires—36 x 4½. Diamond, G. &, J. or Michelin.

Baakes —Two systems. Pour dust proof internal expanding metal to metal hub brakes. Hand lever applies one set. Foot push pedal applies the second set.

Pramb—Pressed steel 4½-inch channel section—with sub-frame—firmly riveted and braced and curved up over rear axle.

Faont Axle—Seamless, cold drawn steel tubing, heavy gauge. forged yokes, or I-beam steel forging.

Reaa Axle—Compound construction. Inner axle used only as a driver. Wheels turn upon double annular type D. W. F. ball-bearings on hollow axle which carries all weight.

Bnny—Curved line cast or straight line sheet aluminum side entrances. Divided front seats. Carrying capacity. seven passengers. (Two on folding seats in toaneau.)

Finish—Coach carmine or national red; black stripes.

Bearings—Anaular type D. W. P. ball-bearings throughout.

Sterainn Systrm—18-iach hand wheel, inclined post. Worm and gear, non-reversible chuck. Ball joint connections tn steerinrs knuckle.

Control—Single lever at driver's right controls all speeds. Three forward and one reverse.

Spaings—Half-elliptic; 40-inch front; under frame. 50-inch rear. outside of frame 39-inch cross on rear.

Equipment — Twn 9-inch Rushmore seareh-lights with generator: side and tail lamps. Storm aprons. horn and tools.

Paice—$4,200.00, P. O. B. Indianapolis

MODEL 9-60

Motar—Six cylinder, 5 x 5 inches, vertical, individually mounted oa sub-frame. Mechanical valves, exhaust and admission on opposite sides and interchangeable. Ball-bearing crank shaft and ball-bearing cam shafts. Tapered nipples used on intake, exhaust and water pipes in place of packing. Extra long Parsons white bronze bearings on connecting rods. Gear driven distributor. Divided alumiaum crank case. Interchangeable parts.

Clutcn—Self - coatained aluminum coae, leather faced, spring cushioned.

Transmission—Sliding gear selective type. Three speeds forward snd one reverse, direct on high. Self-contained annular type D. W. P. ball-bearings on main and counter shafts. Gears run in oil

Wheel Base—137 inches.

Daive—Bevel gear through ball-bearing propeller shaft and flexible joint to rear axle of improved design.

Beaarings—Annular type D. W. P. ball-bearings throughout.

Wneels—Wood, artillery pattern, twelve 1¾-inch spokes front and rear.

Oiling—Crank case, constant level force feed oiler, oiling all working parts of motor.

Ignitinn—Two separate, complete systems. One a gear driven high tension Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs.

Gasoline Capacity—20 gallons.

Tires—36 x 5. Diamond. G. & J. or Michelin.

Brakes—Two systems. Four dust proof internal expanding metal to metal hub brakes. Haad lever applies one set. Foot push pedal applies second set.

Prame—Pressed steel, 5-inch channel section—with sub-frame—firmly riveted and braced and curved up over rear axle.

Prnnt Axle — Seamless, cold drawn steel tubing, extra heavy gauge, forged yokes—or I-beam steel forging.

Rear Axle—Compound construction. Inner axle used only as a driver. Wheels turn upon double annular type D. W. P. ball-bearings on hollow axle which carries all weight.

Bony—Curved line cast aluminum, side entrances, removable tonneau, platform type. Divided froat seats. Carrying capacity, seven passengers (five carried in tnnneau).

Finish—Coach carmine or national red; black stripes.

Steering System—18-inch hand wheel, inclined post. Worm aad gear, non reversible chuck. Ball joint connections to steering knuckle.

Control—Single lever at driver's right controls all speeds. Three forward and one reverse.

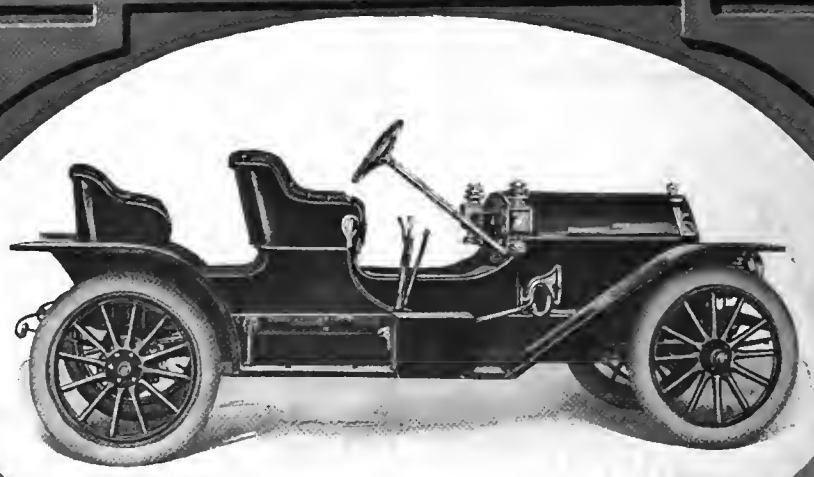
Springs—Half-elliptic; 44-inch front, under frame; 56 inch rear, outside frame; 39-inch cross on rear.

Equipment — Two 9-inch Rushmore searchlights, with generator; side and tail lamps. Storm aprons, horn and tools.

Price—$5,000.00. P. O. B. Indianapolis.

NATIONAL MOTOR VEHICLE COMPANY, 1000 East 22d Street, INDIANAPOLIS, IND.

Standard Manufacturers A. M. C. M. A.



The Inter-State, Model 28
$1,750.00

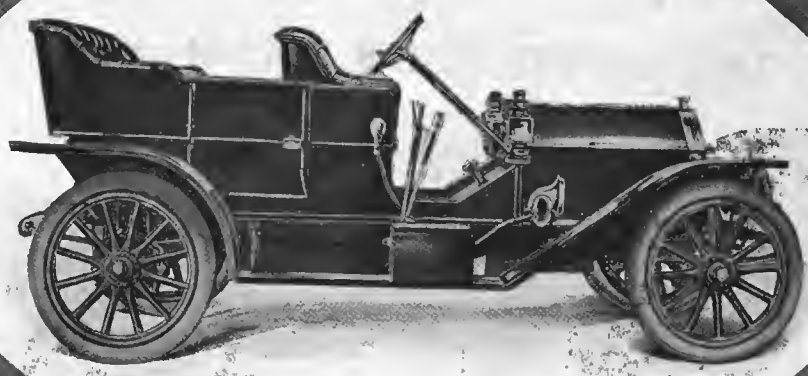
The Inter-State

THE INTER-STATE AUTOMOBILE is built for the intelligent purchaser who wants the high quality which heretofore has been found **only** in **high-priced** cars, but who does not want to pay from twenty-five hundred to five thousand dollars.

The Inter-State makes it unnecessary for such purchasers to pay such prices. It is a **permanent** car, embracing every essential factor of worth in automobile design, style, comfort, speed, endurance, dependable materials and workmanship. And it is sold at a price—$1750 complete, including Eisemann Magneto—but little higher than the cheap good-enough-until-later cars.

There is no economy and most assuredly no automobile satisfaction in buying a car that you will want to discard the second season for a **real** car. Especially since you can buy the **real** car, the **satisfying, permanent** car **this** season for just a little more money than a temporary car.

In justice to your own best interests, let us urge you not to **think** of spending your money for a "cheap" car, or even a higher-priced good car, until you have seen the Inter-State. We are glad to let you be the sole judge as to its worth at $1750.



The Inter-State Touring Car, Model 25
$1,750 00

DEALERS AND AGENTS will appreciate the opportunities opened to them by the Inter-State. Write for our attractive proposition.

At the Shows

The full line of Inter-State automobiles, including Standard Touring Car, Demi-Tonneau, Double Rumble Roadster, Single Rumble Roadster and Tourabout, will be exhibited at Grand Central Palace, New York, December 31-January 7, and at the Coliseum, Chicago February 6-13.

INTER-STATE AUTOMOBILE CO.

127 Willard Street, MUNCIE, INDIANA

SPECIFICATIONS:

Frame—Pressed from cold rolled steel, special stock.

Front Axle—"I" beam, drop forged in one piece—not welded—and double heat treated.

Rear Axle—The reliable semi-floating type with large axle shafts and Hyatt Roller Bearings.

Wheels—Artillery type, 12 spokes, 1¾-in., 34-in. diameter.

Tires—Standard Goodyear Quick Detachable, Continental or Diamond, 34x4 inches.

Brakes—Four 12-in. brakes all acting on rear hubs, external and internal.

Transmission—Three speed selective type and reverse, with vanadium steel gears. The selective mechanism built inside transmission case, thoroughly lubricated at all times.

Gear Ratio—3½ to 1, giving from 5 to 60 miles on high gear.

Horsepower—35 to 40

Motor—Four-cylinder, 4¼x5, water-cooled, cylinders cast in pairs.

Crank Shaft—Special drop forging 35 to 40 carbon steel, double heat treated.

Ignition—Double system Eisemann Magneto, commutator, battery and quadruple coil.

Body Styles—Touring Car, Double Rumble Roadster, Single Rumble Roadster, Tourabout and Demi-Tonneau.

Wheel Base—112 inches.

Tread—56½ inches.

Color—Standard Inter-State red.

Price—With best of equipments, head lights and generator, side oil lamps, tail lamp, tube horn, tire repair kit and tools—Eisemann Magneto—F.O.B. Muncie, $1,750

Automobile and Service. Make sure that you pay for nothing else but this. Check over every car offered you point by point.

You can pay $2500 for a four-cylinder 40-horsepower car, if you want to, but it isn't necessary. You can even go higher, but every dollar you add over the $1600 you pay for Oakland four-cylinder Forty is just so much money wasted. You get not one cent extra value in either service or appearance.

Consider the matter from the common-sense standpoint.

There are five items you want to be sure of in the car you own. Here they are:

1. Ample power—that's for speed and hill-climbing.

2. Ease of handling and operation. You want a car that you can enjoy riding in.

3. Low cost of maintenance. What it costs to run a car is just as important as what it costs to buy one.

4. Style and finish—a car that will be a credit to you when you drive in it—a car for you and your best friends.

5. Simplicity of construction—so that you can master and understand every detail.

The Oakland "Forty"

40 H.P. Touring Car.....$1600
40 H.P. Runabout..... 1600

When you see this big car, and ride in it, it will be hard for you to understand why we do not add at least $500 to its price.

The Oakland "Forty" has a 112-inch wheel base, weight, 2100 lbs., shaft drive, four-cylinder motor, cylinders cast in pairs, 1-2-inch bore by 5-inch stroke, making a power plant that we could rate higher than 40 h.p. if we were inclined to follow the practice obtaining with many makers. It is sufficient to say that no matter how much you "let her out" you will always find the Oakland "Forty" has just a little more reserve power ready for emergency. 34 x 4 tires, front and rear. Cooling is by centrifugal pump and vertical tube radiator. Brake external and internal, acting direct on rear wheels. Transmission is of the selective sliding gear type, three speeds forward and reverse. Steel I-beam front axle. Price includes three oil lamps, two large headlights, horn and complete tool kit.

Its flexibility of control, its quiet, steady transmission, and its remarkable roadability make it the one biggest $1600 worth of automobile you can buy to-day.

Now the Oakland cars (this is true of both the "Twenty" and the "Forty") were not built to meet a preconceived price.

We have other ideals beyond producing the cheapest car on the market.

We designed and built the Oakland car up to a standard that would not admit of the slightest compromise—and then set the price.

The fact that we were able to produce a car that in every respect met the demand of a high-grade family car at a sensationally low price, is just an incident—but a mighty satisfactory one—to the man who wants to get the best car in the country for his money.

So we say again, check over these points before you select your car.

The Oakland "Twenty"

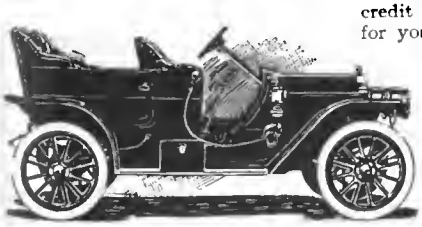
20 H.P. Touring Car or Roadster.....$1250
20 H.P. Runabout..... 1200

A comfortable, roomy family car, equipped with the unique Oakland two-cylinder vertical motor, 1-2-inch bore by 5-inch stroke. Don't confuse this with motors of the double opposed type. It is entirely different and altogether superior, and as they are equipped with an extremely ingenious counter-balancing device, they run with all the smoothness and absence of vibration formerly thought possible only with the four-cylinder motor.

In fact, anyone taking their first ride in an Oakland "Twenty" finds it hard to believe that it is not a four-cylinder motor under the hood, so noiselessly and smoothly does it run.

The "Twenty" has 100-inch wheel base. Weight, 1700 pounds. Shaft drive, 32 x 3 1-2 front and rear tires. Thermo-syphon system of cooling with fan in fly-wheel, vertical tube radiator. Brakes external and internal, operating on drums of rear wheels. Transmission of a superior planetary type, two speeds forward and reverse without a single adjustment ever necessary or possible. Price includes three oil lamps, two headlights, horn and complete tool kit.

You must see an Oakland and ride in it to appreciate the perfect result of Oakland design and Oakland skill in construction. Write for the name of our nearest dealer who will, by actual demonstration, make its superiority clear to you.



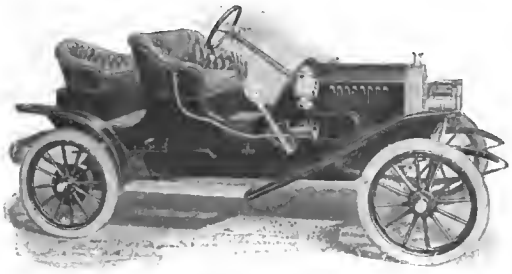
Oakland "Twenty" 2 cylinders vertical 20 horsepower, $1250.

Oakland Motor Car Co.

204 Oakland Avenue
PONTIAC, MICH.

Standard Mfrs. A. M. C. M. A.

We exhibit in New York only at Grand Central Palace Auto Show, opening Dec. 31, and at Chicago Feb. 6 to 13



Model A-1. $800

Specifications

Model A-1.—Will accommodate three passengers; rumble seat; 30"x3" tires; 18 H. P.; speed, 1-35 miles; single chain drive, enclosed; weight, 1350 lbs.; 2 gas lamps and generator; 2 oil lamps; tail lamp; 40" flexible tube. Horn and full tool equipment.

Model A-3.—($875.00). Carries the same specifications as Model A-1, with the exception that it is equipped with a surrey seat in rear instead of a rumble seat.

LAMBERT FRICTION DRIVE CARS

Each Model a Leader in Its Class

The Lambert Car is a **good** automobile at a low price—not for one moment to be confused with **cheap** gear-driven cars.

The lower cost of the **more** efficient, simple Lambert friction transmission is what enables us to make a far better car than **any** manufacturer of gear-transmission cars can make for the same money.

In the Lambert Car there's a full dollar's worth of automobile value for every dollar of the price—and more, too, if judged by the ordinary standards.

We say the Lambert friction drive is more efficient than gear transmission. It is. It transmits under all conditions a higher percentage of the power generated than any type of gear transmission. It is the simplest form of transmission. It eliminates gear troubles and gear expense. It gives to the Lambert Car a smooth-running quality found in few cars.

Each Lambert model is distinguished by **other** simplicity, big-value features. Each is a leader in its class.

Buckeye Mfg. Co., Anderson, Ind.

Model 19. $1750

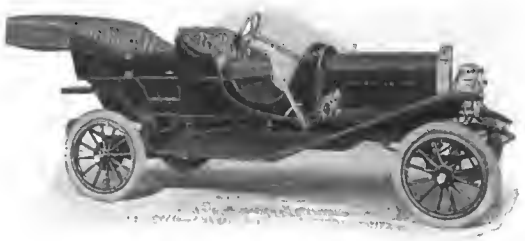
Specifications

Model 19.—Carries 5 passengers; 117" wheel base; 32"x3½" tires; 4 cylinder Rutenber motor with adjustable fan; 35-40 H. P.; speed, 1-50 miles per hour; single silent chain drive, enclosed; painted Lambert green, striped with light green. Special colo on proper notice. Weight, 1900 lbs.; 2 large gas lamps with generator; 2 oil lamps; horn; tool box on running board; full tool equipment.

Specifications

LAMBERT "30"—Capacity, 5 passengers; 28 H. P.; 4-cylinder Rutenber motor, with fan attached; speed, 1-45 miles; wheel base, 110½ inches; single silent chain drive, enclosed in dust-tight metal case; tires, 30"x3½" quick detachable pneumatics; detachable tonneau; weight, 1,600 lbs.; body painted deep red, light red stripe on panel, black moulding, running gear light red, striped with English vermillion; special color on proper notice; equipment, 2 gas lamps and generator, tail lamp, 2 oil side lamps, 40-in. flexible tube horn and full tool equipment. Price, $1250, f.o.b. factory.

The $1250 Model 27 carries the same specifications as the Lambert 30, except that it is equipped with two bucket seats instead of tonneau.



Lambert "30." $1250

LAMBERT FRICTION DRIVE CARS

We Want Lambert Representatives

The demand for automobiles at a low price is unmistakable.

The agent who represents a **good** low-priced car—the Lambert—will get the cream of the business.

Lambert cars, friction driven, have the power, the speed, the endurance, the snappy style, the finish of cars that cost half again as much.

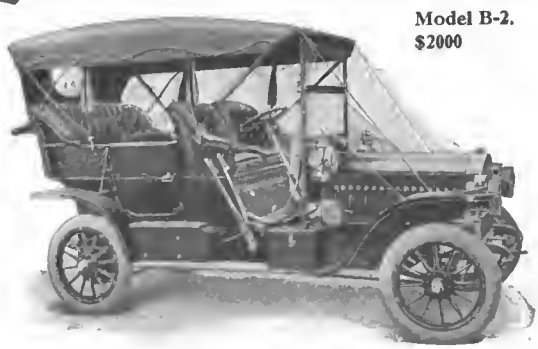
In all territory now unoccupied we want representatives for the Lambert Car. We have an unusually attractive offer to make to the right kind of men who will take up our proposition and look after our interests. We want men who appreciate and will **talk** the Lambert friction drive. Men who know enough about automobiles to recognize the fact that the Lambert Car—each of our six models—is the biggest value on the market at the price.

If you would be interested in taking up the agency question with us, write at once for full details of our proposition. In writing, you will please state what cars you are now handling and your facilities for representing the Lambert. Address BUCKEYE MANUFACTURING COMPANY, Anderson, Ind.

Lambert Cars will be exhibited at the Grand Central Palace Show, December 31 to January

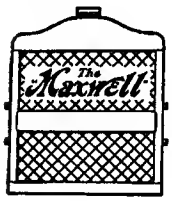
Buckeye Mfg. Co., Anderson, Ind.

Model B-2.
$2000



Specifications

Model B-2.—Carries 7 passengers; wheel base, 106"; 32"x4" quick detachable tires; 4-cylinder Rutenber motor with adjustable fan attached; 35-40 H. P.; speed, 1-45 miles per hour; direct chain drive to each rear wheel; body imperial green, striped with carmine; cape extension; top, with full set storm curtains; glass wind-shield; 2 large gas lamps with generator; oil lamps; tail lamp; horn foot rail; tool boxes on running board and in rear; full tool equipment.



A Personal Invitation to Every Dealer and Prospective Motorist at the Grand Central Palace Show to Visit the Exhibit of

Simply Perfect

The "Maxwell"

Perfectly Simple

"The Aristocrat of Moderate Priced Cars"

I want you to see the Maxwell at the Grand Central Palace show.

In the making of the Maxwell it has been my belief that we could not afford to use anything but the best materials, because a moderate-priced car, to be as successful as the Maxwell is known to be, must be more durable than the highest-priced cars—because in the very nature of things they receive harder service and less expert attention.

I consider Mr. J. D. Maxwell the foremost automobile designer of the world. Practical to the extreme, Maxwell cars are simple, and because of their simplicity—reliable.

You know the Maxwell principles—principles which have been built in these cars since 1904.

We have issued a magazine; like the foundation of Maxwell success, it is the result of mutual effort. So we call it "The Cooperator." Ask for a copy at the Maxwell booth.

Benj. Briscoe President.

MAXWELL-BRISCOE MOTOR CO.

The Maxwell Principles Thermo-Syphon Cooling. Three Point Suspension. Multiple Disc Clutch. Unit Construction. Shaft Drive. Metal Bodies.

The Maxwell Line—Magneto Equipped

30 H. P. Four Cylinder Touring Car or Roadster.....$1750.00
20 H. P. Two Cylinder Touring Car or Roadster, fully equipped.....$1450.00 - $1350.00
14 H. P. Two Cylinder Tourabout, fully equipped.....$825.00
10 H. P. Two Cylinder Maxwell Junior.....$500.00

Get posted now—ask for a catalogue, or better, arrange at our Exhibit for a Maxwell demonstration.

Maxwell-Briscoe Motor Co.

P. O. Box 103

Main Office and Factory: TARRYTOWN, N. Y.

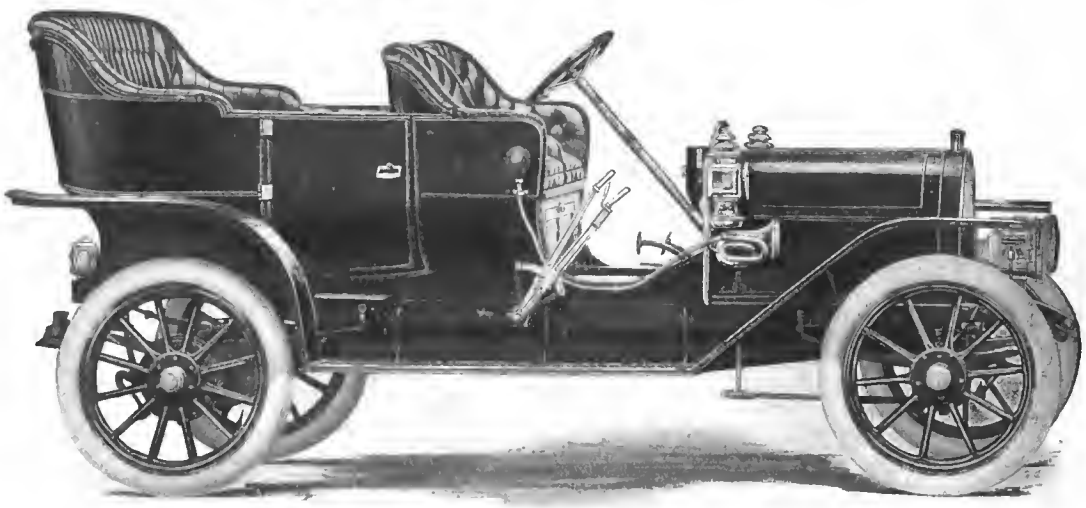
PAWTUCKET, R. I. NEW CASTLE, IND.

Some conditions which make possible the splendid

Cadillac

"Thirty"

at $1400.00



FOUR CYLINDER—30 H. P.—SHAFT DRIVE—SELECTIVE TYPE SLIDING GEAR TRANSMISSION, 106" WHEELBASE.

Ninety-five per cent. of all parts which enter into the construction of the Cadillac Thirty are manufactured in the Cadillac plant.

The Cadillac Company maintains its own brass and iron foundries; its own pattern shops; sheet metal shops; machine shops; gear cutting plants; painting, finishing and upholstering departments.

It makes the magnificent motor and it makes even the little bolts, nuts and cap screws which go into that motor and the car.

It manufactures its own transmissions, its own radiators, its own hoods and its own fenders.

The Cadillac Company operates its own tool making department, in which are made all the special jigs, tools and dies used in the manufacture of the Cadillac Thirty.

Every one of the millions of pieces made each year passes through the hands of a corps of trained inspectors whose watchword is—precision and perfection.

The expenditure for tool maintenance alone in the Cadillac plant in a single year is $60,000.

So accurately is every part finished that thousands of pieces of a kind with thousands of pieces of other kinds, are sent to the various assembling departments and there united without so much as the use of the finest file or emery cloth.

There is no occasion for special "fitting." The limits of measurements in many parts of the Cadillac motor, transmission, etc., are specified to the one-thousandth part of an inch.

More than 500 specially designed automatic labor-saving machines which enable one man to do with greater accuracy the work of four or five, or maybe ten, cut a tremendous figure in reducing cost on an output of ten thousand cars.

Two complete and separate mechanical organizations consisting of 3,200 men are working continually night and day on this same output of ten thousand cars.

It has always been admitted that the Cadillac was the most perfectly standardized car in the world—that its interchangeability of parts was practically absolute.

Now the plant that achieves perfect standardization likewise produces the most perfect running car, provided, of course, the motor and other vital parts are competent.

The Cadillac motor bears a reputation without flaw or tarnish. Twenty thousand Cadillac motors are and have been for four, five and six years operating all over the world, and so far as we know, not one has ever gone out of commission.

The Cadillac Thirty motor is direct heir to all the virtues of the 20,000 other Cadillac motors which have gone before—the most perfect motor the Cadillac plant has ever produced.

Bearing in mind the output of 10,000 cars and the continuous force of 3,200 men and 500 automatic labor-saving machines employed in making them, and the perfect standardization produced by manufacturing all the parts, you will begin to understand why the Cadillac Company is able to build a high grade car to sell at $1,400—a car which in all probability no other plant in the world could build and sell for less than $2,500.

The next step is to see the car (it will exceed your highest expectations in dignity, proportion and richness); to ride in it at any reasonable speed up to 50 miles per hour; to examine carefully the engine and the mechanism and then to put it into active road competition with any higher priced car you may choose.

If you will do this our car is installed.

In New York Cadillacs will be exhibited only at Madison Square Garden, Jan. 16-23, and in Chicago at the Coliseum, Feb. 6-13.

CADILLAC MOTOR CAR CO.
DETROIT, MICH.
Member A. L. A. M.

Gearless and Olympic Line

FOR 1909

GEARLESS

Model 30-60, 6-cylinder - - $3250.00
Model 50, 4-clyinder - - 2750.00
Equipped with Gearless Transmission
Model 35, 4-cylinder - - 1500.00
Friction Drive

OLYMPIC

Model 30-60, 6-cylinder - - $3250.00
Model 50, 4-cylinder - - 2750.00
Selective Type Transmission
Model 35, 4-cylinder - - 1650.00
Selective Transmission Axle

GEARLESS 35. 35 H. P.

MOTOR: 4-cyl. 4½″ x 4½″, Renault type. Water cooled
WHEEL BASE: 119 inches
WHEELS: 36 inches
TIRES: 3½ inches

MAGNETO IGNITION, $1500.00

AXLES: I-Beam front and rear
IGNITION: Low tension magneto and dry cells
TRANSMISSION: Friction disc operating by spring pressure. Side chain drive.
BODY: 4-passenger roadster, 5-passenger touring

Write for Catalogue

GEARLESS MOTOR CAR CO.

295 PLYMOUTH AVENUE **ROCHESTER, N. Y.**

THE MARMON

"A Mechanical Masterpiece"

Marmon "Thirty-two", $2400

An Automobile Classic—A Conspicuous Value

The Marmon "Thirty-two" is neither a cheaply built car at a low price nor a "good enough" car at a high price.

It is a high grade car in every sense of the word, built as carefully as a fine watch. The parts are interchangeable, all of them manufactured by us, rigidly tested and carefully assembled into a harmonious whole.

Weighing not over 2,100 pounds, with 32-40 H. P., this "Thirty-two" has a world of speed and ability. In performance, as in appearance, it is a car that needs no apologies—occasions no regrets—a car you will be proud to own.

The "Thirty-two" sustains the Marmon reputation for mechanical excellence. It can be depended upon to stand up under the most severe usage year after year.

To the man who looks ahead and buys with his eyes wide open, this car is an emphatic bargain. No other car on the market at $3000 or less offers so much actual value.

Get the specifications, notice the character of design and equipment, and make a few careful comparisons.

Genuine Krupp and Chrome Nickel Steels are used for important parts. Bosch magneto and battery—dual system. Three point motor support. Straight line shaft drive. Rear axle and transmission in one unit. Marmon oiling system. Large brakes. Hess-Bright imported ball bearings. Big tires (34 x 4 all around). Complete equipment. Furnished as Touring Car, Roadster, Suburban, Coupe, or Limousine Town Car.

The Marmon "Fifty," $3750

A superb car, of most distinguished appearance. In hard, practical cash value, it is the superior of the most famous foreign cars selling at two or three times the price. Furnished with seven-passenger body. 50-60 H. P. Completely equipped.

Marmon "Forty-five" Roadster, a special model, $3500

The 1909 Marmon models are being exhibited at the Grand Central Palace Show, New York
They will also be exhibited at the Chicago Show, Feb. 6-13

Nordyke & Marmon Co.
Estab. 1851
Indianapolis, Ind.
Standard Mfrs.,
A.M.C.M.A.

Built Here

Marmon Fifty, $3750

The Easiest Riding Car In The World

Pullman '09

ANNOUNCEMENT

WE are ready for 1909 business. As hitherto in years past, the "PULLMAN" cars will maintain leadership as positively the very best automobile value obtainable.

If it is possible to attain perfection, we have reached that state in the 1909 "PULLMAN" cars.

Viewed from any standpoint—as a prospective purchaser or a dealer in motor cars—you can't match the "PULLMAN" quality, the "PULLMAN" prices or the wonderful "PULLMAN" efficiency, design, simplicity of construction, ease of operation, economy of up-keep, durability; in fact, "PULLMANS" are in every feature incomparably superior to any cars yet designed.

Model "K" 30 H.P. Touring Car. 4½ inch bore, 4½ inch stroke.
Price, $2000.00, including Bosch Magneto.

Every step from the raw material to the finished car in the progress of the making of a "PULLMAN" Automobile is under the eye of an expert in OUR OWN FACTORY and we stand back of the quality, which is the highest standard that can be produced.

In your own interest, don't buy a car, don't accept an agency, until you have full particulars about 1909 "PULLMAN" CARS.

A Model to meet every requirement at the right price. WRITE TO-DAY

York Motor Car Co.

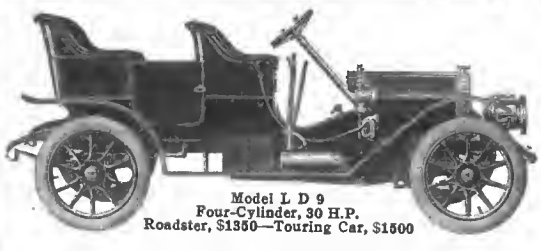
York, Pa

KISSEL KAR

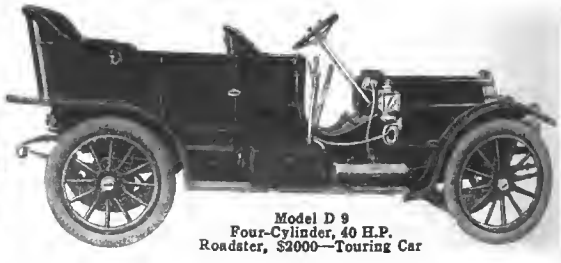
SEE THEM AT THE SHOWS

Remy Magneto or Atwater-Kent Generator and Dry Cells

A LOW-PRICED CAR ALL QUALITY



Model L D 9
Four-Cylinder, 30 H.P.
Roadster, $1350—Touring Car, $1500



Model D 9
Four-Cylinder, 40 H.P.
Roadster, $2000—Touring Car

SEE them at the shows, and if you are going to be open-minded about buying a car it will mean a saving of as much as a thousand dollars. Kissel Kars have the same construction and features as cars costing from $3000 up—Double ignition, three-quarter elliptic springs, floating type rear axle, I-beam front axle, Timken roller bearings throughout, and two on rear axle instead of one as an extra provision to secure perfect alignment. *Remy magneto with single unit coil, or Atwater-Kent generator and dry cells on Model D 9 and on Model G 9; the 6-cylinder, 60 H. P. $3000 Kissel Kar, and Remy magneto with single unit coil, and dry cells on Model L D 9.* Model D 9 is a five and seven passenger car, Model L D 9 four or five passenger—that's the only difference. **SEE THESE CARS AT THE SHOWS.**

Write to-day for catalog and name local dealer.

Kissel Motor Car Co. 122 Kissel Avenue **Hartford, Wis.**

Premier

The direct comparison between American and foreign cars under the same roof at the Grand Central Palace emphasizes the fact that Europe has lost her supremacy.

The Premier stock chassis is generally conceded to represent the highest achievement in motor car engineering.

"The Quality Car"

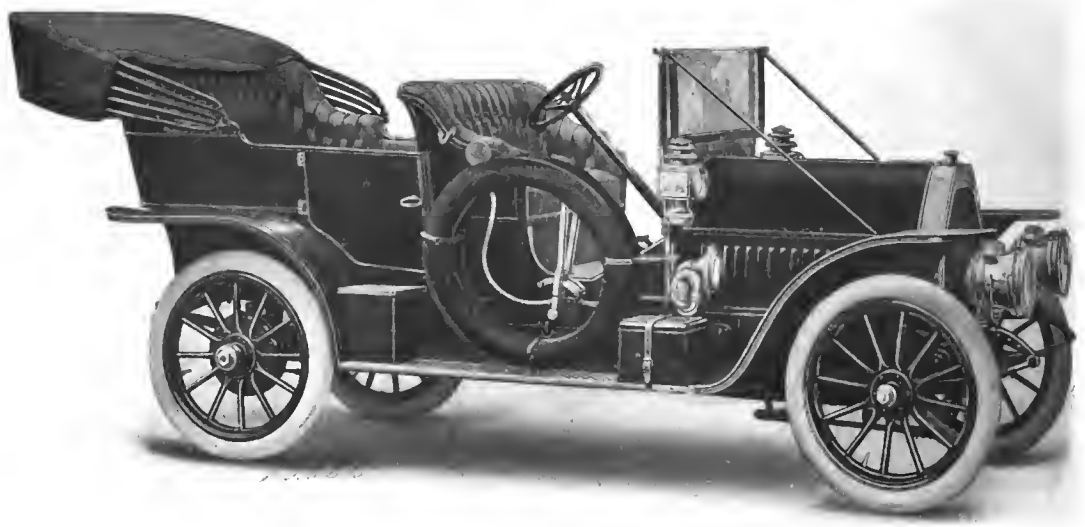
Send for Catalogue T

Premier Motor Mfg. Co.
Indianapolis, Ind.

R. M. Owen & Co.
Distributors
East, North and Northwest

The Jewel "40" Touring Car

Price $3,000 Complete



A Suggestion of Its Completeness

Rutenber Motor, Bosch Magneto, Connecticut Coil and Exide Battery; selective transmission; platform rear suspension; Truffault-Hartford Shock Absorbers; Timken Roller Bearings; 36-inch wheels; Diamond or Goodyear Tires, 4-inch front, 4½-inch rear; full extension top and folding glass wind shield; complete lamp equipment with large Prest-O-Lite Gas tank; trunk rack, extra tire holders, etc.

Sounds a lot for the money and it is a lot for the money. We have pride in our product, which is limited, and practically no overhead expense. We have gotten right down to earth and put together the best car that we know how, with every part of the best material that can be purchased anywhere.

There Isn't Any Guesswork in the Jewel Car

There wouldn't be any guesswork in the mind of any honest agent who aims to give his customers the most he can for the money.

There's a lot of honest agents, too, whose business we can't handle—for, as stated, our output is limited. To the few who speak quick enough, we'll offer an attractive proposition and we'll make good on everything we say. Try us.

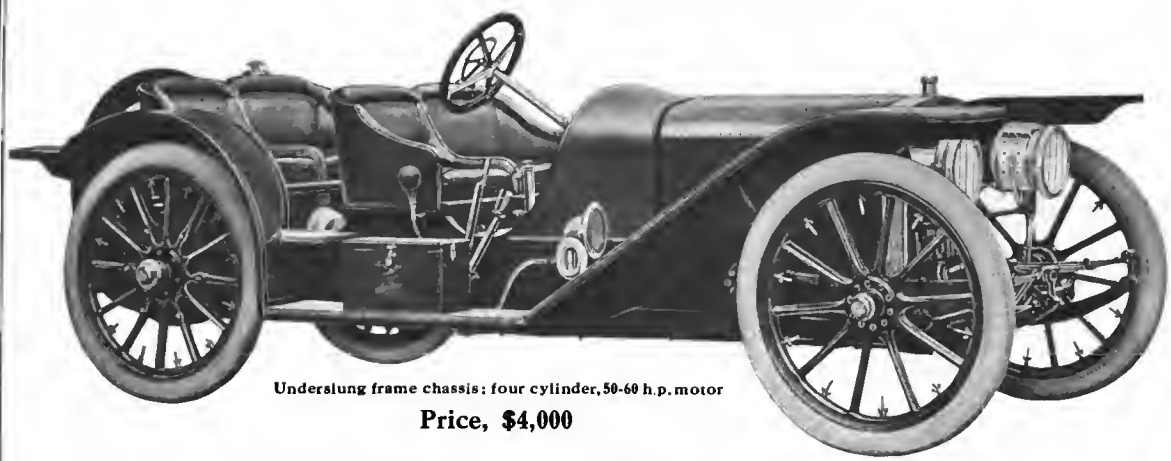
The Jewel Motor Car Company

131 Walnut Street, Massillon, Ohio, U. S. A.

THE AMERICAN

40-inch wheel

TRAVELER



Underslung frame chassis; four cylinder, 50-60 h.p. motor

Price, $4,000

THIS CAR WILL BE THE SENSATION OF THE SHOW

From this time forward you will hear more, and more, and more of the American. . . . .

Heretofore American owners had been mostly men who had formerly driven fine imported cars.

For two years the discriminating few have understood its unique position in the motor market. But the crowd has followed the plants of huge output and conventional construction.

Only two hundred American cars will go out into the several states this season, but each will be driven by a motor connoisseur who cares little about first cost if power, service and value be there.

In your clubs, and wherever men meet to discuss the merits of motoring, you will hear its name with increasing frequency, displacing, as like as not, some other name that has hitherto been more familiar.

The philosophy of this you will better understand if you will study the smart make-up of the car; learn something of the unique underslung construction of the American Traveler and write for a descriptive account of its mechanical anatomy and performances.

SPECIFICATIONS OF THE AMERICAN TRAVELER.

Motor—Four cylinders cast in pairs; 5⅜x5½ in. 50-60 H. P. Water cooled; centrifugal circulating pump.
Ignition—Bosch high tension magneto; auxiliary coil and battery.
Carbureter—Float feed, auxiliary air supply type.
Lubrication—Four-sight-feed lubricator for cylinders and mechanism. Splash oiling crankcase. Transmission and differential run in oil.
Clutch—Leather-faced, fan-bladed cone interlocked with emergency brake.
Drive—Direct shaft to differential and floating live rear axle that bears no weight.
Wheels—40x4 in. front, 40x4 in. rear.
Wheelbase—122 inches. Tread, 56 inches.
Equipment—Two gas headlights; tail lamp; trunk rack; acetylene generator; French horn; tool kit.

AMERICAN MOTOR CAR CO.

INDIANAPOLIS, IND,

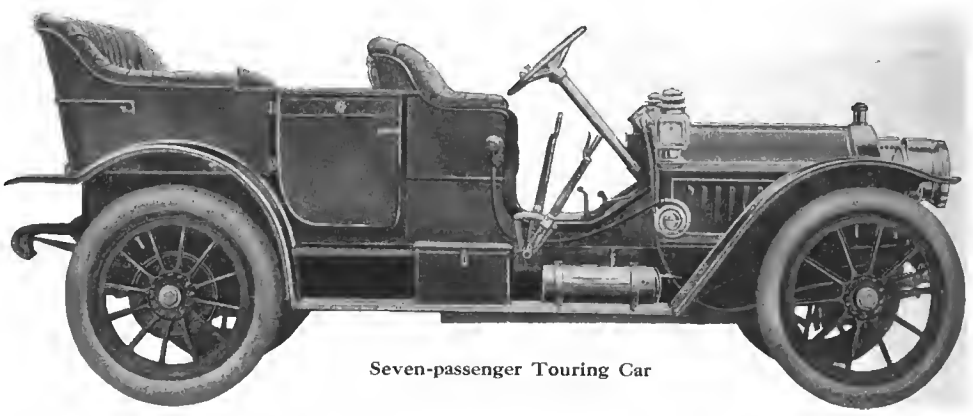
Standard Manufacturers A. M. C. M. A.

See the AMERICAN at the Grand Central Palace Show this week

Not an Assembled Car Not an Assembled Car

The AMERICAN SIMPLEX

Fifty Horsepower Valveless Two cycle Engine Runs with the Smooth Rhythm and Applies Power with the Constancy of the Electric Motor



Seven-passenger Touring Car

50 H.P. FOUR CYLINDER, VALVELESS TWO CYCLE MOTOR

You may not live to see it, but the day is surely coming when the two cycle gas engine will be the only type used in motor cars.

It is inevitable.

We have recognized the virtues of the two cycle principle and incorporated it in the American Simplex first.

We are the pioneers among manufacturers of cars of the class in which the American Simplex stands.

Every manufacturer who puts into his car a six cylinder engine admits the vital deficiency of the four cycle principle—intermittent power—and his inability to overcome it.

Multiplicity of cylinders merely approaches—never attains—constant turning power—the continuous torque you've heard so much about.

The American Simplex two cycle engine applies power with the constancy of the electric motor.

There is not a valve, spring, roller cam or cam shaft on the American Simplex two cycle engine. They would be superfluous. They hinder the four cycle from generating its power in a steady, unceasing rush—yet the four cycle engine cannot be built without them.

The American Simplex is a manufactured car.

It is manufactured in our own plant in its entirety—motor, transmission, differential, gears, frame—every part where strength or harmonious action is vital to the long life of the car and the smoothness with which its motor runs.

That is the reason the American Simplex is a motor car symphony—there is complete harmonization of parts which no assembled car can have.

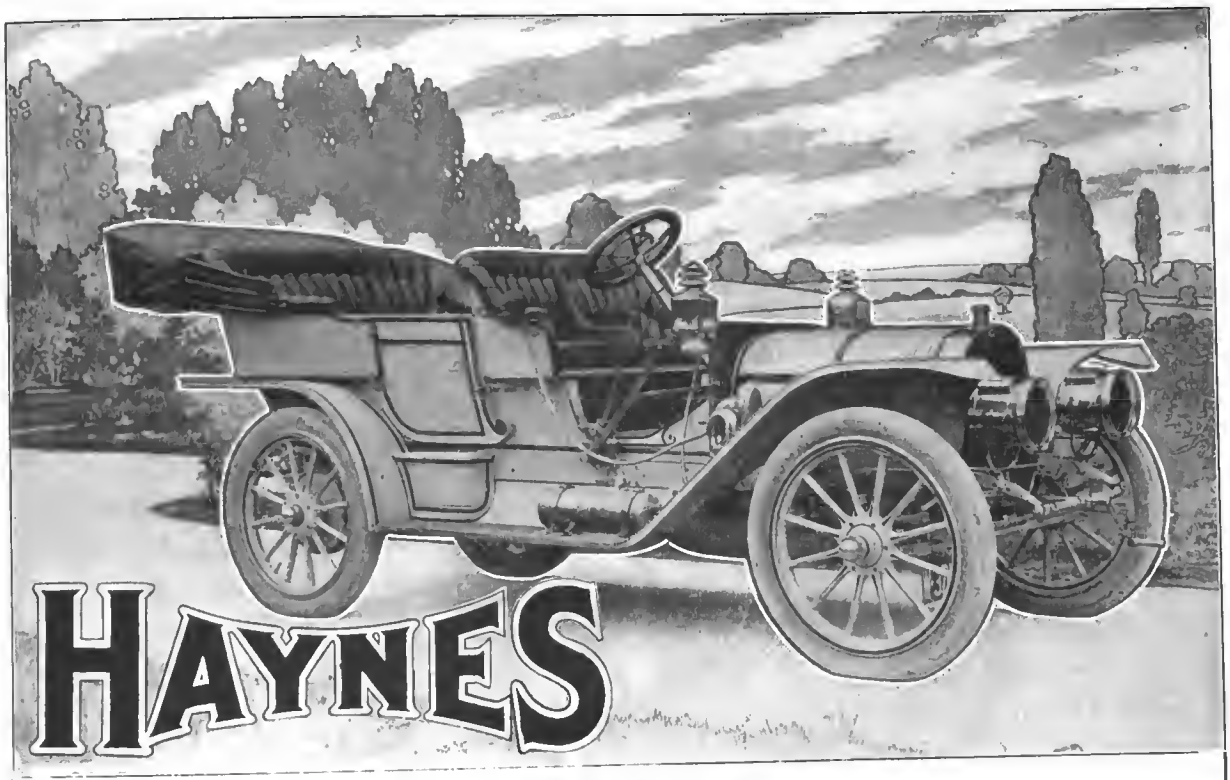
Our 1909 literature tells of the flexible three point motor suspension and radiator attachment; the rear axle transmission; the interlocking device on the gears; the improved torsion tube; the everlasting brake adjustment—every one a feature exclusive in the American Simplex—together with a comprehensive explanation of the differences in operation and results between the American Simplex valveless two cycle motor and all four cycle motors. Write for it.

Simplex Motor Car Company

Mishawaka, Ind.

Member A. M. C. M. A.

See the American Simplex in Space D, Grand Central Palace Show, New York, Dec. 31-Jan. 7. Demonstrating Car at the Show.



The Haynes for 1909—40 H P., $3,000

A Talk to Agents

People are wary of the good-looking car that a chauffeur or an expert is unwilling to commend.

Possibly there are some agents who think that the merits of the Haynes universal joints, for instance, are too technical a matter to interest the average business man that comes in to look at the car. Maybe. But next day that man's friend, who knows an automobile when he sees it, steps in.

He gets into the chassis instead of into the tonneau.

He finds the universal joints with the floating cube of solid steel that can't ever break, and the big wearing faces that never wear out.

He finds other things, too—a unique and simple roller-pinion-and-sprocket direct drive that solves certain old problems at the rear axle, obviating wear, strains, noise and friction at a place that is a danger point in most cars. He finds a better clutch than any other car ever had. He finds a ratchet gear system that prevents gear stripping. He finds a double flywheel on the motor that makes it run like a six-cylinder without a six-cylinder's cost and complication. And he finds tremendous strength, almost needless strength, everywhere.

And the man that sent him may not hear about those technical points, but he does hear something that makes him 'phone the agent to reserve that car till cheque arrives in the morning.

Certain Haynes territory is open this year, and we are ready to talk business if you are just the right man.

HAYNES AUTOMOBILE CO., Kokomo, Indiana

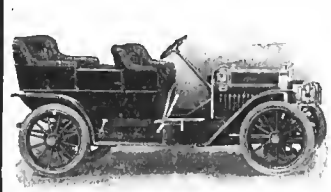
Oldest Automobile Manufacturers in America

Members A. L. A. M.

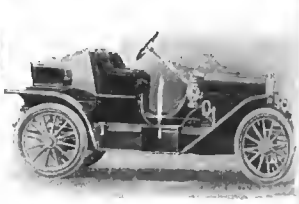
42 Highest Awards and Perfect Scores

NEW YORK, 1715 Broadway

CHICAGO, 1702 Michigan Ave.



Regal



The Automobile Sensation of the Year

There are some low-priced four-cylinder cars on the market.

BUT REMEMBER

The Regal is not an experiment. This is its 2d year and it has made good.

Compare it with a Regal **$1250** **Why buy a Freak?**

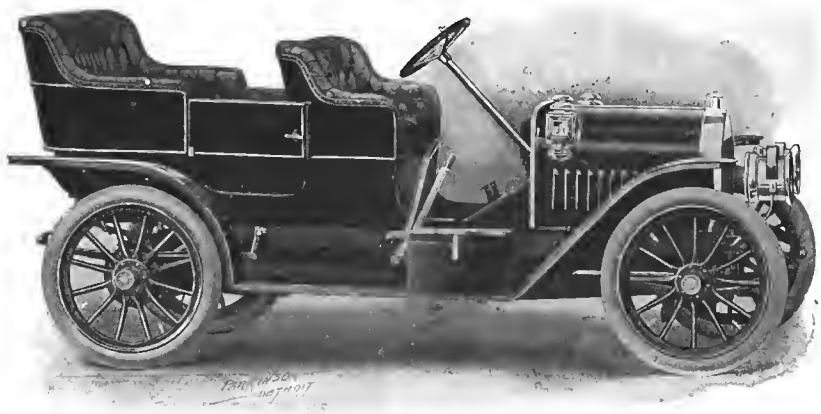
4 Cylinder

30 H. P.

Water Cooled

High Tension Magneto

105 in. Wheel Base



MODEL "A"
5 Passenger Touring Car

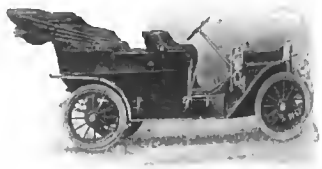
MODEL "B"
3 or 4 Passenger Runabout

Three speed and reverse selective type sliding gear transmission combined with rear axle. 32 inch wheels. 3½ inch quick detachable tires. 12 spoke wheels, front and rear. The high tension magneto is a standard equipment on all models. Offset crankshaft. Exhaust and inlet valves interchangeable. Cone clutch.

The day of inflated ideas and enormous profits is passed. The automobile industry is settling down to a sane, business-like proposition. No more "Hurrah Boys" business. No more 100 per cent dividends and enormous expenses. The automobile must be produced on a manufacturing basis. Small profits. Large sales. Honest goods. If you want a car with no experiments, no freak ideas, no fads — just an automobile — buy a Regal.

Further specifications are provided in our catalogue, which may be secured from our nearest representative or will be mailed direct upon request.

SEE OUR EXHIBIT AT THE NEW YORK SHOW, GRAND CENTRAL PALACE



Regal Motor Car Co.

Trombley Ave., Detroit, Mich.

14 Entries. Only one perfect score—The Franklin.

Against thirteen competitors, the 1909 Model D Franklin touring car won the only perfect score in the Worcester, Mass., reliability contest, December 12. Eight of the contestants went through the road run without penalization. But the Franklin was the only one to withstand the rigid examination after the run by a technical committee from the faculty of the Worcester Polytechnic Institute.

All except the Franklin suffered penalization due to broken, strained bent or loosened parts leaks, etc.

It was necessary for the committee to go over the Franklin six times in order to satisfy the other competitors.

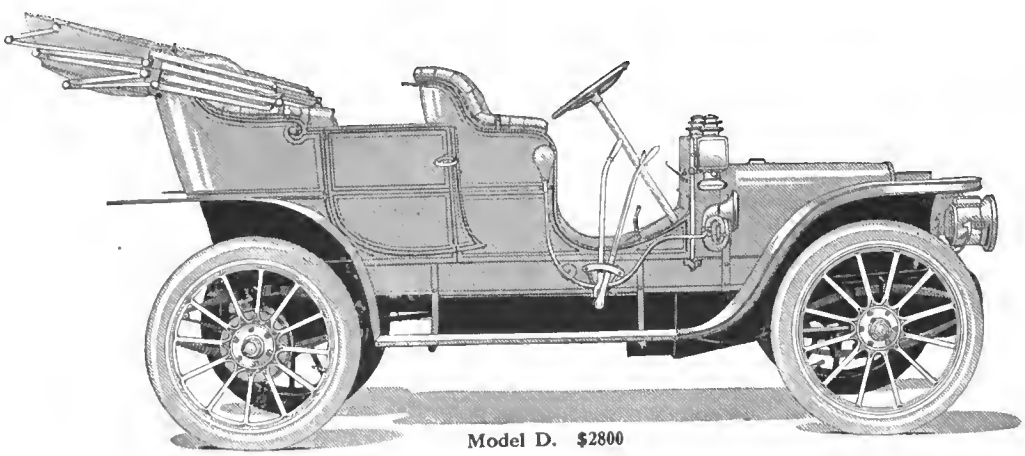
Was this luck? No!

This is the fifth severe contest in which a 1909 Franklin stock model has carried off the honors. Franklins won perfect scores in the Glidden Tour. The only Franklin entered in the Bretton Woods endurance run won a perfect score. Another Franklin won a perfect score in the 1000-mile Chicago reliability contest and also had the lowest gasoline consumption in its class. Still another Franklin won a perfect score in the Cleveland sealed bonnet run and had the lowest gasoline consumption of all contestants.

These five consecutive perfect scores in five consecutive contests, each with a stock model and —except in the Glidden Tour—only one in each contest, are most significant. How significant is of interest to every buyer of an automobile. No other automobile has such a record.

Most any automobile can make a hard road run without stops, but to go through without troubles of any kind and without any derangement or strains resulting is what tells the story.

The light-weight air-cooled Franklin does not strain or rack itself. It stands up. It rides comfortably.



Model D. $2800

A high-grade powerful automobile. Refined, reliable and safe. Abler for touring on American roads than any automobile but a Franklin. Beautiful to look at, comfortable to ride in and doing its work at the lowest operating cost.

H. H. FRANKLIN MFG. CO., Syracuse, N. Y.

ACME SEXTUPLET
6 Cylinder, 50 H. P. $4,500

THE ACME MOTOR CAR CO.
READING, PA.

At the Grand Central Palace Show, December 31 to January 7, we will exhibit the following 1909 models:

THE SPECIAL "QUAD"
(Type XXVII.)
Four cylinders, 5" x 5", 5 or 7 seats
$3,750.

THE STANDARD "QUAD"
(Type XXVI.)
Four cylinders, 4¾" x 5", 5 or 7 seats
$3,500.

THE ACME SEXTUPLET
(Type XX.)
Six cylinders, 4¾" x 5", 5 or 7 seats
$4,500.

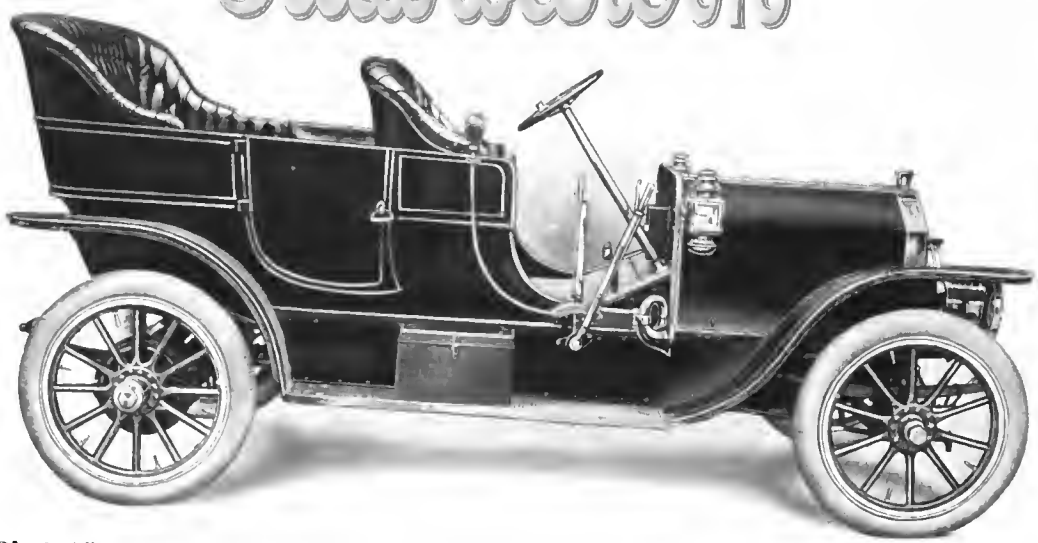
THE "FAIRMOUNT" SEXTUPLET
(Type XXI.)
Six cylinders, 4¾" x 5", Roadster or Tourabout
$4,500.

THE ACME "MIDGET"
(Type XIX.)
Four cylinders, 4½" x 5", 2 passengers, shaft-drive
$2,500.

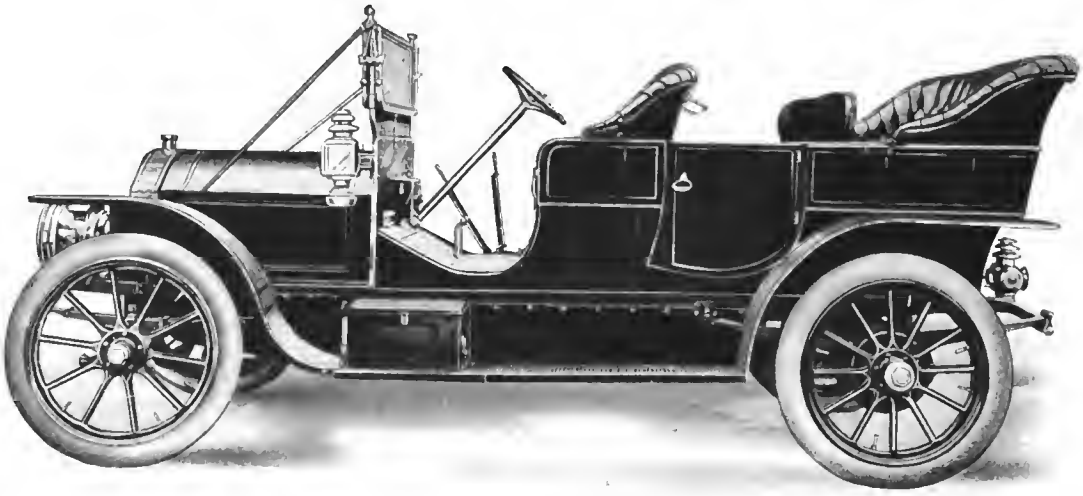
THE "VANDERBILT" ACME
(Type XXV.)
Six cylinders, 5" x 5", 5 or 7 seats
$6,000.

We have a limited amount of unoccupied agency territory which we will close at the Show.

Great Western



No. 21—62½ lbs. per H.P. 40 H.P., 4-Cylinder Motor, 4 1-2″ bore, 5½″ stroke. Weight, with complete equipment, 2500 lbs.
Price, $2500



No. 22—58⅓ lbs. per H.P. 50 H.P., 4-Cylinder Motor, 5″ bore, 6″ stroke. Weight, with full equipment, 2940 lbs.
Price, $4000

MODEL AUTOMOBILE COMPANY

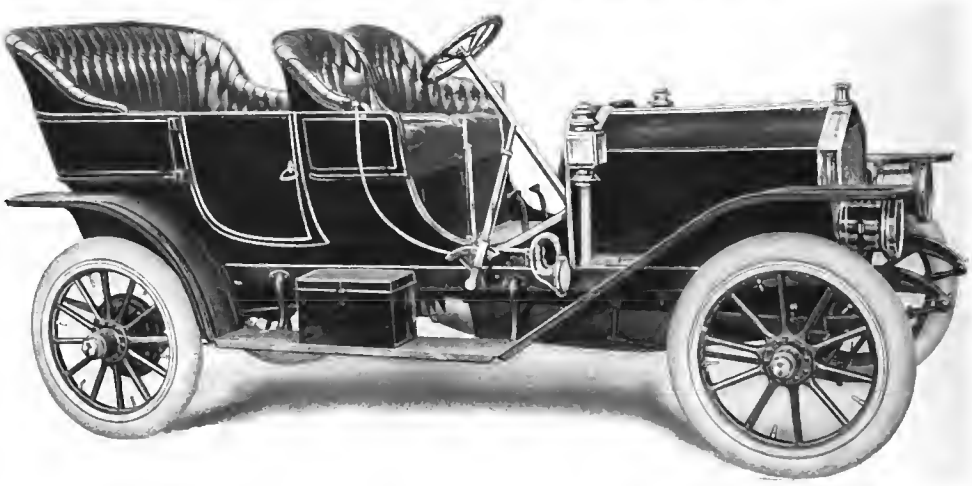
97 SMITH STREET - - - - - PERU, INDIANA, U. S. A.

DISTRIBUTING AGENCY

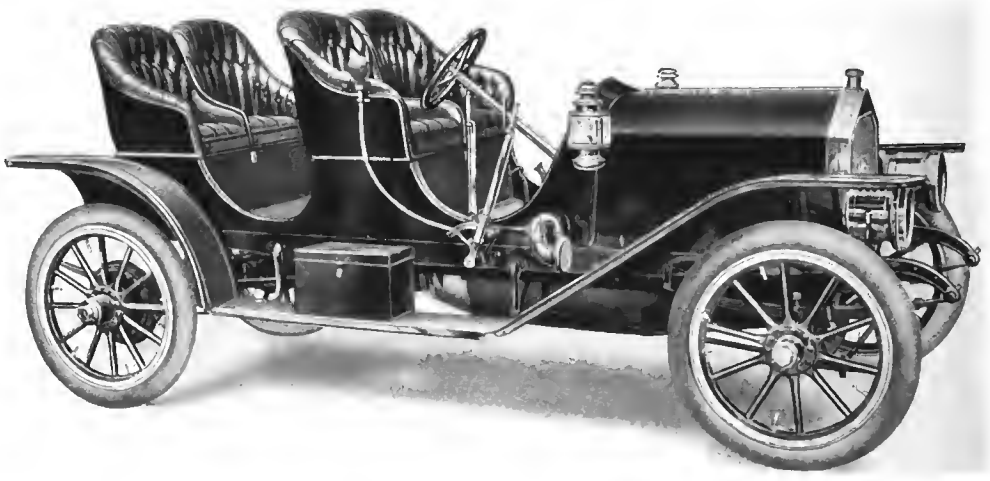
GREAT WESTERN AUTOMOBILE COMPANY

1706-8 MAIN STREET - - - - - - - - KANSAS CITY, MISSOURI

Great Western



No. 20—66⅔ lbs. per H.P. 30 H.P., 4-Cylinder Motor, 4″ bore, 5″ stroke. Weight, with complete equipment, 2000 lbs.
Price, $1600



No. 20-A—63⅓ lbs. per H.P. 30 H.P., 4-Cylinder Motor, 4″ bore, 5″ stroke. Weight, with complete equipment, 1900 lbs.
Price, $1600

MODEL AUTOMOBILE COMPANY

97 SMITH STREET - - - - - - PERU, INDIANA, U. S. A.

DISTRIBUTING AGENCY

GREAT WESTERN AUTOMOBILE COMPANY

1706-8 MAIN STREET - - - - - - - - - KANSAS CITY, MISSOURI

E-M-F 30

$1,250

F. O. B. DETROIT, MICHIGAN

MAGNETO INCLUDED

—OF COURSE

IF YOU'VE DECIDED TO BUY AN AUTOMOBILE

AN AD—FULL OF ADJECTIVES—a page of pretty platitudes will not suffice to appease your craving for facts and figures—if you've made up your mind you will buy a car and it's now only a matter of deciding which car will best suit your particular needs.

YOU WANT INFORMATION—some facts you can tie to—some points you can compare—and the more the better—with similar points in other cars.

SO WE WON'T WASTE WORDS in this ad—we'll give you facts boiled down in the form of complete specifications showing just how the E-M-F "30" is made, of what, and why.

YOU'LL FIND BY COMPARISON that this car is a full-sized, 5-passenger automobile. Same dimensions as other cars selling for twice as much, and larger—much larger—than any other car selling for the same price.

IF YOU ARE VERSED in the mechanical lore of motor car construction you will find all you desire here. If you dont know, then you know someone who does know—and the more he knows about points that spell superiority in a car the stronger will be his verdict in favor of the E-M-F "30."

AFTER YOU HAVE DIGESTED THIS thoroughly look up the nearest E-M-F "30" dealer —there are 500 of them—and arrange for a demonstration—that will settle the question.

SPECIFICATIONS:

MOTOR—HORSEPOWER—30.

TYPE. 4 cylinder, Vertical, 4 cycle. Cylinders cast in pairs with water jackets integral. *Water space between cylinders* ensuring uniform expansion and contraction. Valves all one side. Mechanically operated. Interchangeable.

CYLINDERS. Bore 4". Stroke 4½". Compression—moderate. All experience bas proven tbese cylinder dimensions to be nearly ideal for all kinds of service. Tbey give a motor of moderate speed—wbich means long life. Cooling, lubricating and all otber troubles wbich arise from short stroke, excessive bore, small exbaust valves and sbort bearings are entirely eliminated in tbe E-M-F. "30."

CRANK CASE. Cast from bigbest grade aluminum. Hand hole covers, stamped steel. Instead of the usual cast aluminum arms for supporting motor in frame tbe E-M-F. motor is carried on pressed steel members in "U" section—no beavier—three times as strong.

VALVES. Are extra large—2⅛"—made from special steel, drop forged. Stems and seats ground. Valve guides macbined and pressed into place instead of being cast integral witb cylinders—easily replaced wben worn.

All engineers agree tbat large valves not only make for efficiency, but also for economy. A four cylinder motor of 4" x 4½" may, by scientific design, accurate workmanship and large valves be made to develop 30 to 35 borsepower at 1,000 revolutions per minute, or it may develop 16—if valves are under size or tbe design faulty in other ways.

VALVE PORTS. Inlet and exhaust passages very large and unobstructed—eliminating all cbance of eddy-currents, ensuring maximum power efficiency and perfect cooling qualities.

VALVE OPERATION. Single cam-sbaft made from higb grade steel, drop forged with *all cams integral.* After milling, cam-sbaft is case bardened, and all cam surfaces as well as bearings are ground to micrometrical accuracy—guarantees silent running and consistent performance at all times.

CRANK SHAFT. *Is off-set* ¾" from centre line of cylinders—still another increase in power efficiency with minimum ot wear on cylinder walls and pistons. Crank sbaft, drop forged from special steel. Three main bearings—all large and extra long. *All bearing surfaces ground.* Flange, forged integral on cranksbaft carries fly-wheel—ground to ensure perfcct centre. Fly-wheel is also given a *running balance* at maximum motor speed to ensure accuracy and absence of vibration.

CRANK SHAFT BEARINGS. Special habbit ("White metal" alloy) in accordance with best modern practice. Cam,sbaft bearings, pbosphor-bronze.

CONNECTING RODS. Drop forged steel. I-beam cross section. Crank-pin bearing equal lengtb eacb side of centre—not off-set. Piston pin bearings, phosphor-bronze. Wrist pin bearings, marine type—not hinged. Lined with die-cast babbit. Shims provided for adjustment, wbich is easily made through large band holes in bottom of crank case.

PISTONS. Extra long—5"—ensuring good compression and long life. Each piston ground, fitted with four rings, and *each set is weighed* to ensure perfect balance of reciprocating parts—a talking-point witb some makers—a matter of course witb us.

PISTON RINGS. Eccentric type; ground on periphery-face to conform to exact bore of cylinder; also on both sides.

PISTON PIN. Special case-bardened steel ground; drilled hollow to ensure perfect lubrication. Piatons, connecting rods, crank-shafts and *oll reciprocating ports ore mechanicolly balonced* to eliminate vibration.

LUBRICATION. Splasb—automatic, vacuum feed—reliable and economical. Oil reservoir cast integral witb aluminum crank case. After having tried countless mechanical "positive feed" oiling devices and found tbem all wanting in some particular, foremost engineers have decided that tbe only really positive feed is by gravity; and experience proves that no amount of piping to cylinders and bearings will ensure the same liberal oiling to all moving parts as the old, original splasb system, by wbich tbe entire mechanism is kept constantly batbed in oil. Tbe one shortcoming of tbe gravity feed syatem was tbe necessity for throttling the feed to prevent flooding, and tbe tuhes frequently became clogged at tbe valves.

By our system of vacuum regulation—the utilization of one of tbe simplest principles in nature—we are ahle to use large tubes, ⅜". Tbis absolutely inaures free flow of oil from the reservoir, and a constant level in the crank case. Radius: on one filling of oil reservoir, 300 to 500 miles, according to road conditions.

COTTER PINS, lock-nuts, keys and taper pins are used at every point to guard against any part getting loose.

OIL CUPS. Are orovided for every joint tbat may at any time require lubrication—steering knuckles, spring connections, operating shafts, etc., etc.

IGNITION. Double system, consisting of (a) magneto, (b) battery. Tbe magneto is not an extra or "special equipment." It is as much a part of the E-M-F. motor as the valves, and is included in the list price of tbe car. Gears and all moving parts enclosed in oil tight, dust and water proof case. In this regard the E-M-F. car sets a pace for tbe world, higb priced cars included.

ENGINE GEARS. Cam-shaft and Magneto gears all enclosed and separated from crank cbamber. Gears lubricated by non-fluid grease—not cylinder oil.

COOLING. Is by large centrifugal pump—higb efficiency at slow engine speeds ensuring cooling in bill climbing and bard pulling over muddy roads. Belt driven, stamped steel fan mounted on engine—not attacbed to radiator. Eccentric belt adjustment.

CARBURETOR. Improved simple float, single jet—our own design. Very flexible and economical. Carburetor is located on driver's side of motor, away from hot exbaust pipes and otber parts—readily accesaible.

CLUTCH. Improved expanding-ring type. Leather faced. Contained in fly-wbeel. Oil groove in fly-wbeel witb boles drilled for escape of oil obviates all liability of clutcb slipping from this cause. Takes hold gently—and bolds when engaged. Adjuatment, accessible and easy.

TRANSMISSION. Type—Selective aliding gear. Gear case integral with differential bousing in rear axle—"the unit power transmission system" so generally approved by engineers of late. Gears made from E-M-F. formula special steel. Accurately cut and oil treated. Instead of aquared shaft for sliding gears, round shaft with four keys integral bas been adopted—key-ways milled and *ground*. *Geor centers olso ground* to ensure perfect alignment on shaft and silent running—details of construction heretofore known only to the higbest priced cars.

SPEEDS. Tbree forward and reverse—direct on third.

GEAR RATIO. Standard, 3¼ to 1. Speed of car, 50 miles an hour, down to 2, (you won't belicve it till we show you) on high.

DRIVE. Direct tbrougb universal jointed propeller sbaft to bevel gear on differential. Two universal joints. Pressed steel torque shaft. Gears extra large, accurately cut and made from special alloy steel.

DIFFERENTIAL. Bevel gear type—four pinions—another feature beretofore considered too expensive for any but bigh priced cars.

REAR AXLE. E-M-F. exclusive design. Right and left bousing sections drawn from sheet steel and heat treated, giving extra strength. Fitted with trusa rods. Hyatt Roller Bearings in hardened and ground removable sleeves carry load. Differential thrust bearings, babbit between ground steel washers. No balls to split—no adjustment to get out of order. Made right to stay right. Thrust of drive pinion supported by Timken Roller Bearing.

Auto-genous welding—acetylene-oxygen process—discussed so mucb in engineering circles and trade journals of late is used in this axle as well as in several other parts of the car.

Tbanks to drawn steel, auto-genous welding and "clean" deaign, this axle is lighter than any other live or floating axle on cars of similar weight and power—notwithstanding the entire transmission mecbanism is incorporated in it.

All gears—transmission and differential—as well as all shifting mechanism, are immersed in an oil batb. And the transmission-axle case as well as motor crank-case are absolutely oil tight—no mucking of floor boards or dripping on pavements. Provision is made to prevent the oil working out at the axle ends when the car is left standing on an incline. Liberal road clearance.

FRONT AXLE. I-beam type. Drop forged in one piece—not welded in centre. Heat treated. Spring percbes forged integral. Liberal safety factor. Spindles off-set back of yoke-posts—scientifically correct—affords easy steering, witb tendency to go in straight line. Steering knuckles and all connections drop forged from steel—no castings. Two-point ball bearings, bubs and all joints bronze bushed.

STEERING GEAR. Irreversible, worm and sector made from special steel case hardened. All bearing surface-ground. Connection from steering arm, at right, to left knuckle arm, obviates all tendency to "crankiness" on rougb roads.

CONTROL. Gear-sbift lever at rigbt of driver. Throttle and spark levers on left side of steering post, below wbeel—operated by fingers of left hand without releasing grasp on wheel. Rigbt hand free for emergency brake and gear shifting—the ideal control, rapidly superseding tbe fad for levers on top of wheel. Auxiliary foot accelerator. Clutch operated hy left foot, aervice brake by right foot. Emergency brake hy hand lever on right—ratcbet lock.

WHEELS. Artillery type. Large spokes—12. Spokes and felloes first grade second growth hickory.

TIRES. 32" x 3½" on all wbeels. Morgan & Wright. Universal quick-detachable rims.

BRAKES. Four—all acting on rear hubs—none on transmission. Service hrake, contracting steel bands, camel-hair lined, acting on pressed steel drums integral with rear hubs. Emergency brakes, internal expanding rings in same drum—metal-to-metal. Both sets double acting. Grip on drum is intensified by motion of car after brakes have been applied. Service brakes being on outside rendera adjustment easy. Pressed steel disc closes drum, making it dust proof.

SPRINGS. Front, semi-elliptic. Rear, full elliptic. Extra wide for tbis weigbt of car—2". Driving tbrusts and braking straina taken hy two radius rods—not hy springs.

FRAME. Pressed steel—U-section. Side members straight—weakened neither by off-setting nor dropping.

MUFFLER. E-M-F. design, silent. Silencea by radiation—not by obstruction. Absolutely no back-pressure.

FENDERS. Enameled steel in the newest style, most approved enclosed-full-lengtb-of-tbe-car type.

MATERIALS. Cylinders made from special formula higbest grade, fine grain, gray iron. Intake pipe, brass. Exhaust pipe, gray iron. Crank case, aluminum. Frame, gears, aprings, axles and driving shafts all made from special steels—each from an alloy best suited to its peculiar service, and all from E-M-F. formula. Operating levers, spring supports, spring clips, sbackles, brackets, rod-ends, etc., ateel, heat treated. All smaller parts, not drop forged, are pressed or stamped steel—*no malleoble castings* enter into the construction of the car—maximum atrengtb witb minimum weight, and *absolute assuronce of* the aafety factor desired.

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TOURING CAR. 5 passenger, roomy tonneau with liberal leg-room. Latest atyle, most approved, straight-line type. Handsomely finished.

The "TOURABOUT"—an E-M-F. innovation. A classy 4-passenger car. Rear seats detacbable, leaving room for trunks and baggage. A rumble seat is included in regular equipment; when attached makes a natty 3-passenger roadster.

WHEEL BASE. 106". TREAD. Standard—56½". Special for Southern Roads 61".

WEIGHT. Touring Car slightly under 1,800 pounds.

GASOLINE CAPACITY. 15 gallons. OIL, 1 gallon.

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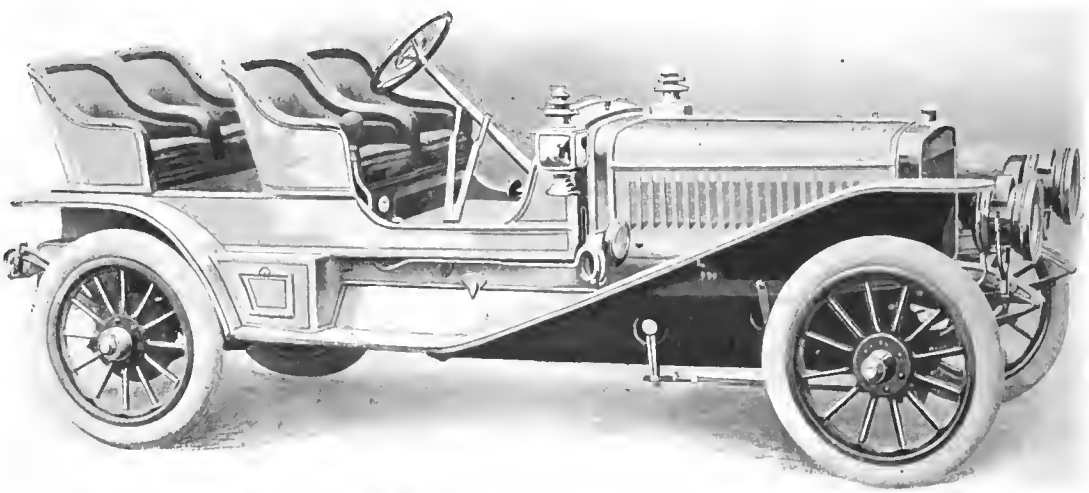

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because we make sixes exclusively. Instead we are making sixes exclusively because sixes are superior to all other types. And we can prove it to you just as we have done to hundreds of others.

The Winton Six isn't a four with two added cylinders. It is a Six from the drafting room to the shipping department, from the radiator to the tail lamp. And because it is a real Six (not a makeshift) the Winton Six proves in its work all the points of superiority we claim for it.

The Winton Six starts without cranking.

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TWO CYCLE MOTOR CARS

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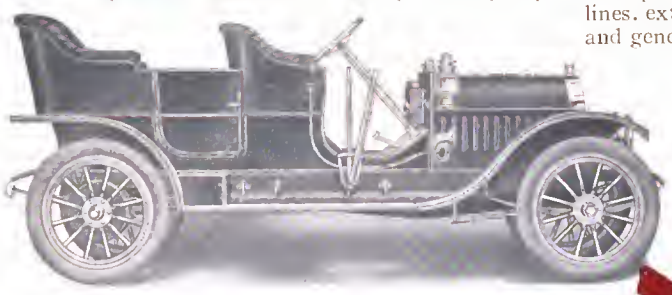
The 1909 Touring Car has pressed steel frame, 110" wheel base geared pump, geared oiler and geared fan, Atwater Kent ignition, ¾ elliptic rear springs, 34x4" tires, aluminum body, handsome lines, extreme ease of riding, full equipment of lamps and generator or tank; price $2,000.



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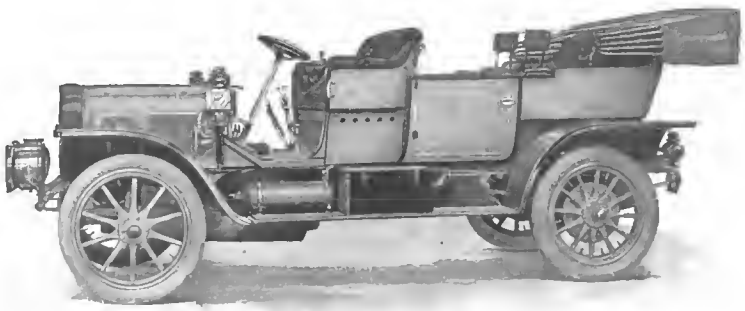

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